SONY

For The Next Generation

Sony's commitment to environmental ideals

Environmental Report 1999

GLOBAL ENVIRONMENTAL POLICY

Sony first laid down a set of basic guidelines for environmental performance in March 1993. The policy went into effect the following month. To reflect ongoing shifts in public attitudes and concerns, the company revised the guidelines in July 1995. Today, this revised Sony Global Environmental Policy is positioned as a core element of operations in all members of the worldwide Sony Group.

Philosophy

Recognizing that environmental protection is one of the most pressing issues facing mankind today, Sony incorporates a sound respect for nature in all of its business activities.

Guidelines

1.

The Sony Group will form and maintain an organization that can promote a variety of environmental protection activities.

2.

The Group will establish technically and economically viable environmental objectives and constantly seek to enhance the quality of its conservation activities.

3.

Group companies will observe all applicable laws, regulations and agreements related to the environment. Moreover, the Group will create autonomous standards for even more effective environmental protection.

4.

The Group will pursue improvements in all areas of operations, including resource and energy conservation, recycling, and the reduction of waste.

5.

To the fullest extent possible, the Group will adopt alternative technologies and materials in place of environmentally harmful processes and materials, such as ozone-depleting substances, greenhouse gases and other pollutants. The Group will also collect and recycle such substances and take other steps to minimize their use.

6.

The Group will make products and develop technologies that minimize environmental impact.

7.

Through environmental audits, the Group will continually endeavor to upgrade its environmental management capabilities.

8.

The Group will contribute to society through community activities related to the environment.

9.

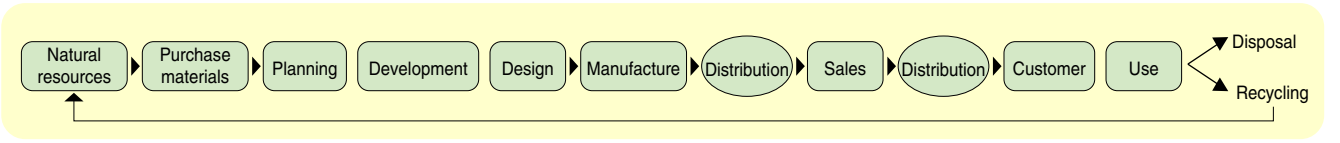
Through education and internal communications, the company will strive to instill a better understanding of its environmental policy and raise awareness of environmental issues among all employees.

10.

As required, Sony will publicly disclose information on its development of environmental technologies, materials and products as well as its environmental management activities.

This policy will be made available both within the company and to the public.

OUR ENVIRONMENTAL IMPACT



Sony is in the business of manufacturing products from the Earth's limited resources. This process begins with the purchase and transport of materials (1), an activity that consumes energy and releases CO_2, NOx, SOx and other gases into the atmosphere. Next, manufacturing (2) requires water, energy and chemicals and results in the release of CO_2, NOx and SOx. The finished products are delivered to customers (3) via distribution and sales channels that also release air pollutants through the consumption of energy. Due to the nature of most of our products, the primary environmental impact during their use (4) is in the form of consuming electricity. At the end of their useful lives, products will be discarded (5), unless they can be recycled or otherwise processed. Discarded products hold the risk of releasing some of the chemicals they contain into the air, water and soil.

Based on an awareness of this series of events that make up a product's environmental impact, Sony is striving to produce goods in a manner that creates the most value while using the smallest amount of resources. Sony aims to establish an environmentally compatible product flow. This entails reducing the various processes that have a smaller environmental burden, switching to more benign chemicals and promoting recycling.

OUR ENVIRONMENTAL INDICATORS

Sony has established a list of indicators that enable the quantitative monitoring of the company's environmental impact and concrete steps to reduce that impact. The most important of these indicators are listed below.

Indicator	*Significance*
1) Number of ISO-14001 certified sites	Adoption of environmental management systems
2) Waste volume vs. sales	Waste reduction and recycling-Resource conservation
3) Unit energy consumption (petroleum equivalent consumption vs. sales)	Energy conservation-Prevention of global warming
4) Unit CO_2 emissions (CO_2 emissions vs. sales)	Energy conservation-Prevention of global warming
5) Reduction in paper use	Conservation of paper
6) Used paper recycling rate	Conservation of paper
7) Recycling of recycled paper	Conservation of paper
8) Reduction in power consumption of products	Energy conservation-Prevention of global warming
9) Reduction in standby mode power consumption of products	Energy conservation-Prevention of global warming
10) Reduction of styrene foam used for products	Resource conservation
11) Product dismantling time	Product recycling-Resource conservation
12) Product possible recycling rate	Product recycling-Resource conservation
13) Number of Greenplus certified products	Progress in reducing the environmental impact of all Sony products
14) Emissions of pollutants (emission volume vs. sales)	Prevention of pollution of air, water and soil
15) Number of environmental reports and site reports issued	Progress in promoting disclosure
16) Environmental costs	Progress in allocating resources to environmental activities

A MESSAGE FROM THE MANAGEMENT

In recent years, I have sensed that the Earth has lost much of its mystique. When I was a child, the Earth was a heavenly body of an unimaginable scale. But technological progress like long-distance jets along with worldwide environmental pollution now make this planet appear to be small enough to hold in one's hand.

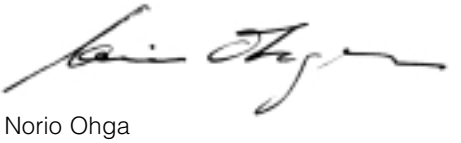
If we continue to concentrate solely on our own countries, companies and personal lives, this tiny planet will suffer even more. Today we stand at the threshold of a new century. This is truly a time to devote serious thought to how we can ensure that Earth remains a pleasant place to live. For example, rapid industrialization in countries near Japan poses a threat to the environment of nations farther down the jet stream. Dealing with this issue demands cooperation that spans national boundaries and industries.

Energy is an urgent environmental issue, in large part because its production is closely linked to global warming. If we continue to rely on the limited amount of fossil fuels, I am convinced that we will no longer be able to sustain today's living standards. Now more than ever before is the time to develop energy sources that are environmentally benign, safe and clean.

Sony is well aware of its obligation to society. We are working diligently on ways to make our products more environmentally friendly and recycle end-of-life products to conserve the Earth's precious resources. As one of the people responsible for managing Sony, I intend to continue to work with others to tackle energy-related issues and other environmental subjects.

I trust that this publication will provide useful insights into Sony's efforts to protect the environment.

April 1999



Norio Ohga
Chairman of the Board and Chief Executive Officer

As the 20th century draws to a close, Sony is changing in many ways. For example, we have announced our intention to restructure our diverse operations under a "unified dispersed" management model to maximize the Sony Group's shareholder value and excel in a network-centric era.

Sony is, in a sense, a type of living entity, and we intend to never stop evolving with the times. But one fact that will never change is that our businesses, or for that matter, all economic activities of mankind, will continue to harm the environment. This irrefutable fact must be the starting point for all of our environmental initiatives. Furthermore, these initiatives must go beyond mere words or posturing. This is why we have identified the environment as one of Sony's central long-term management themes. I am determined to bring about real and significant improvements. The Sony Group will soon have an ISO-14001-based environmental management system at every business location in the world. We should now put this system to work to make steady progress in reducing our environmental impact by as much as possible, even in small steps.

Sony has positioned the environment as an integral element of its management practices. Our objective is to help create a society in which the world's finite resources are used wisely to create even greater value. Technological efforts at Sony have already led to several achievements. Among them are the use of limonene to recycle styrene foam and the development of a high-polymer coagulant.

The 21st century is already being coined the age of the environment and I am determined to see Sony become a significant force in this era through the development of unique and distinctly "Sony-like" environmental innovations.

I hope this report will give you a better understanding of our current environmental programs and future goals. Thank you for your interest.

April 1999

Nobuyuki Idei
President and Co-Chief Executive Officer

About This Report

Sony has been publishing an environmental report since December 1994. The aim of these reports is to build a broader understanding of the various environmental initiatives promoted by the Sony Group worldwide. This is the third environmental report, following the edition that was released in April 1997. In this publication, we focus on the primary environmental activities that took place during the 1997 and 1998 fiscal years. The discussion covers past events as well as our hopes and plans for the future. We believe this will provide our readers with a better appreciation of Sony's commitment to the environment and the actions we are taking to fulfill this commitment. Currently, we plan to release updated environmental impact data, which is contained in the back pocket of this report, in October 1999 and to release the fourth edition of this environmental report in April 2001.

(For general information about Sony's business activities and financial performance, please refer to the company's latest annual report. Please view the report on Sony's home page or contact Sony to receive a printed copy: Sony Corporation, Investor Relations, Phone: 81-3-5448-2180, Facsimile: 81-3-5448-2183)

CORPORATE PROFILE

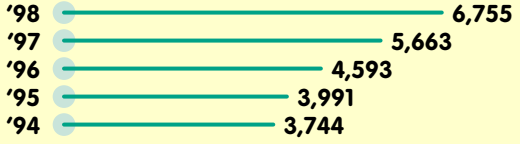
Head Office: 7-35, Kita-Shinagawa 6-chome, Shinagawa-ku
Tokyo 141-0001, Japan
Established: May 1946
Employees in Group: 173,000
(consolidated, as of March 30, 1998)

< Main Businesses >
Electronics, including audio, video, information and communications, electronic components; Game consoles and software; Music; Motion picture and television business, and theatre operations; Insurance; Other businesses, including customer financing, leasing, broadcasting, networking, and other businesses

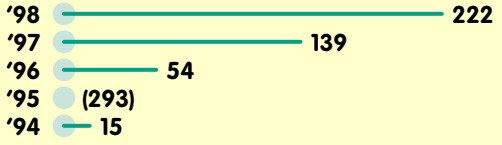
< Sales by Geographic Segment >
(year ended March 31, 1998)
Japan: 27.3%, America: 31.1%, Europe: 23.2%, Other areas: 18.4%

Consolidated Financial Highlights
(for years ended March 31)

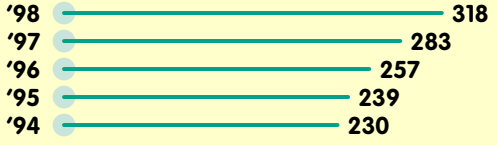
Sales and Operating Revenue (¥ billions)



Net Income (Loss) (¥ billions)



R&D Expenses (¥ billions)



Capital Expenditures (¥ billions)

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Environmental Architecture

Organization • Objectives

Sony's environmental activities span the globe.

Environmental Conservation Committees (ECCs), which come under the aegis of the Sony Environmental Conservation Committee (Headquarters), have been established in Japan, North America, Europe and Asia. These committees identify the problems facing their regions and devise responses that can be implemented easily and efficiently. The various business units in the Sony Group also pursue environmental programs tailored to specific offices or product areas. Together, the ECCs and the business units engage in a wide range of initiatives to protect the environment on a Group-wide scale.

The company's activities in this regard are based on the premise that each and every employee participates. To this end, Sony has put in place an environmental management system in all Group offices worldwide. While carrying out their respective duties, employees are always on the lookout for ways in which they can make a meaningful contribution to the environment.

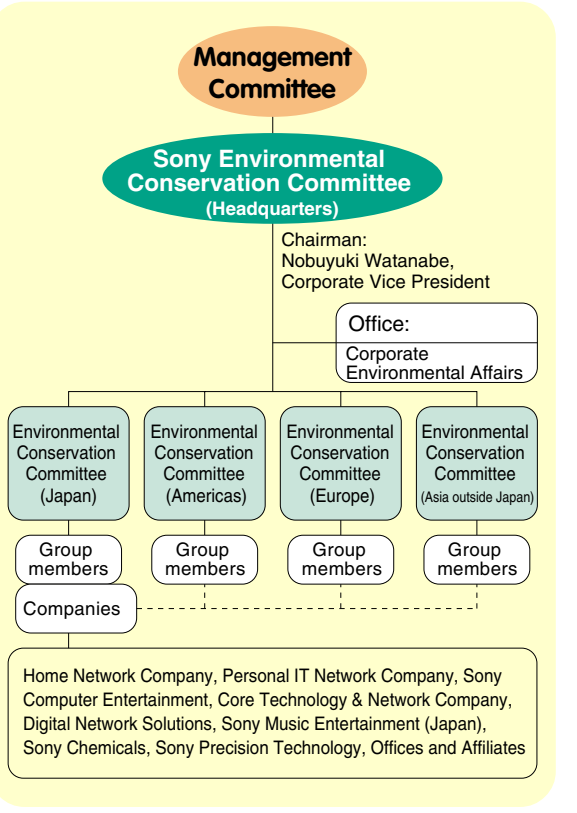
Organization

ENVIRONMENTAL CONSERVATION COMMITTEES

The Sony Environmental Conservation Committee (Headquarters), which is based in Japan, has ultimate responsibility for determining the environmental-response measures of Sony operations around the world. The committee sets basic policies for programs throughout the Group. This includes drafting the Global Environmental Policy and the Sony Environmental Action Plan. There are 14 committee members, including the heads of each regional ECC. Meetings are normally held biannually. The composition of the committee was revised in April 1998. This reorganization coincided with the following events:

1) The appointment of a director responsible solely for environmental matters
2) The separation into two committees of the head office's environment-related functions. The two committees are the Sony Environmental Conservation Committee (Headquarters) and ECC (Japan).
3) Each member of the Sony Environmental Conservation Committee was given responsibility for a particular theme ① Environmental education ② Recycling ③ "Green" purchasing ④ Logistics ⑤ Environmental R&D ⑥ Greenplus ⑦ Environmental PR ⑧ Environmental advertisement ⑨ Environmental audits ⑩ Regional issues

These committees will be realigned whenever necessary due to changes in the businesses and organization of the Sony Group to maintain the best possible system at all times.



REGIONAL ENVIRONMENTAL CONSERVATION COMMITTEES

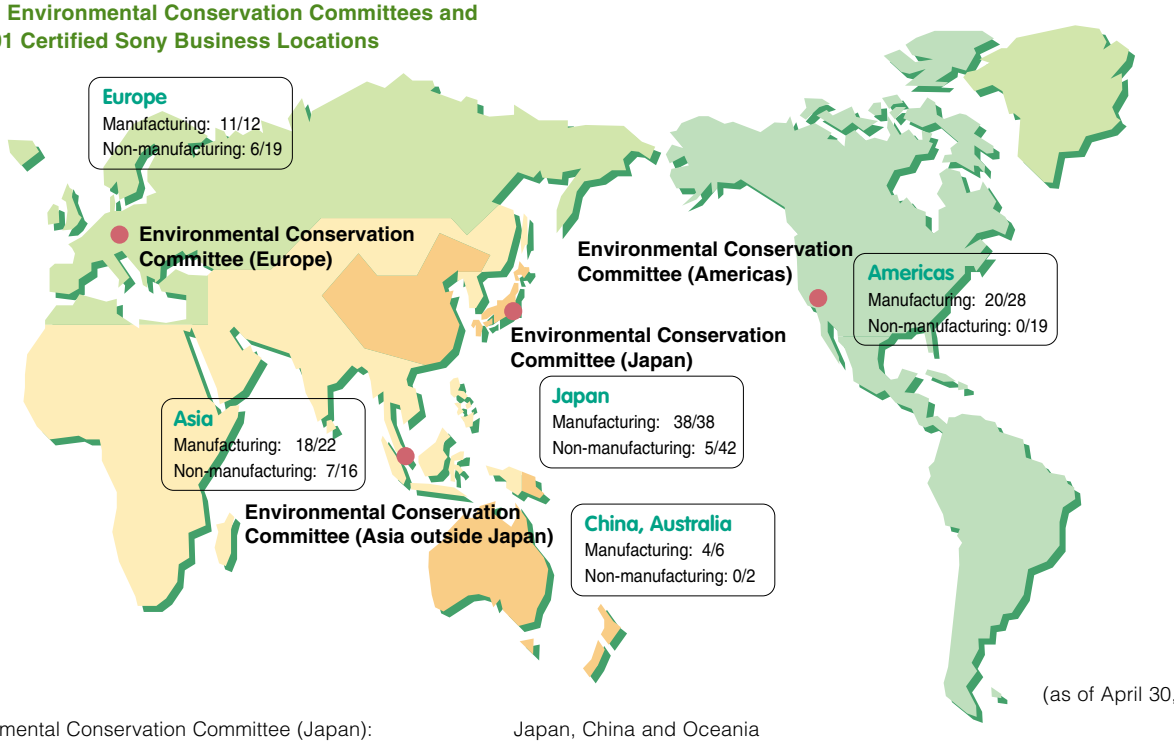
Each ECC handles audits and provides guidance for Sony operations within a particular geographic zone and normally holds a committee meeting four times a year. Furthermore, a Sony Environmental Conference takes place in each region annually. Environmental managers from each zone as well as committee members from other regions attend. These conferences promote an exchange of information from a global perspective. They are also a valuable forum for reviewing activities and debating measures to take in the future.

CHIEF ENVIRONMENTAL OFFICERS

Sony Headquarters selects chief environmental officers from the personnel involved in environmental activities at companies, business centers, research facilities and other facilities in the Sony Group. These individuals are then appointed as members of the ECC (Japan). Although this committee is located in Japan, its directives on subjects such as the creation of environmentally sound products and reducing the environmental impact of Sony manufacturing bases are disseminated to Group bases worldwide.

Sony Environmental Conservation Committee (Headquarters), November 1998

Regional Environmental Conservation Committees and ISO-14001 Certified Sony Business Locations



(as of April 30, 1999)

Environmental Conservation Committee (Japan):	Japan, China and Oceania
Environmental Conservation Committee (Europe):	Europe, Africa along the Mediterranean coastline and Russia
Environmental Conservation Committee (Americas):	North and South America
Environmental Conservation Committee (Asia outside Japan):	Asia excluding China, Middle East, and Africa excluding Mediterranean coastal countries

ENVIRONMENTAL MANAGEMENT SYSTEMS

At Sony, environmental management systems are positioned as an integral part of the company's corporate management structure. The company is building an environmental system through the acquisition of ISO-14001 certification. Sony's goal is to complete this process at all business locations by the end of March 2001. This environmental system is to be employed as the fundamental means for conducting conservation-related activities at every Sony operation and continuously upgrading environmental performance.

Sony International Singapore has attained ISO-14001 certification from JACO & PSB.

TASK FORCE SUBCOMMITTEES

The Corporate Environmental Affairs office regularly holds a variety of task force subcommittee meetings. The purpose of these gatherings is to look more closely into specific issues concerning the environment, promote the exchange of information and discuss action plans. Meetings are held anywhere between 2 to 12 times annually depending on the nature of the task. The Product Recycling Task Force was dissolved in October 1997 to enable the more aggressive promotion of recycling and related research by the individual business units.

In other developments, the Energy Efficiency Task Force was merged with the Environmental Pollutants Committee in July 1998, resulting in the creation of the Environmental Management Task Force. The Life-Cycle Assessment (LCA) Study Meeting was renamed the LCA Task Force in January 1999. Finally, the Environmental Public Relations Working Group was formed in May 1998.

Information and actions taken by these groups and other units are shared with Sony's overseas environmental conservation subcommittees so that similar measures can be enacted at operating bases outside Japan.

Main Task Force Subcommittees

- Product Assessment Meeting
- Greenplus Project Meeting
- Halogen-Free Promotion Meeting
- LCA Task Force
- Environmental Management Representatives Meeting
- Environmental Management Task Force
- Environmental Public Relations Working Group

Objectives

Green Management 2000

The Sony Group's Environmental Action Plans Around the World

Sony has an Environmental Action Plan to set forth concrete means for following through on its environmental philosophy and policies. The information below presents the plans and major targets established in each region of the world in accordance with the Green Management 2000 program for the period from October 1996 through March 2001. In November 1998, Green Management 2002 was formulated to facilitate the creation of a single Sony Environmental Action Plan. The four regional action plans were subsequently revised and integrated.

Reduction of the Environmental Impact of Business Processes

1. ISO-14001 Certification
   - All manufacturing bases acquired ISO-14001 certification by the end of March 1998.
   - All non-manufacturing bases are aiming to achieve ISO-14001 certification by the end of March 2001.
2. Prevention of Global Warming
   - At all Sony business locations, targeting a 25% reduction in the ratio of petroleum-equivalent energy consumption to net sales by fiscal 2000 compared with fiscal 1990 levels.
3. Zero Disposal
   - Lowering the ratio of waste volume to net sales by more than 50% compared with fiscal 1991 levels.
   - Eliminating landfill use by fiscal 2010.
4. Reduction of Environmental Pollutants
   - Now Prohibited. Trichloroethane, CFCs, benzene and other substances are now prohibited.
   - To Be Eliminated. Cadmium, mercury, chloromethylene and other substances are to be eliminated by fiscal 2000.
   - To Be Reduced. Compared with fiscal 1993 levels, VOCs, lead and other substances are to be reduced 25% by fiscal 1997 and 50% by fiscal 2000.
   - To Be Closely Controlled. Chlorine, ammonia, arsenic and other substances are to be closely controlled in accordance with regulations.
5. Responsible Use of Paper Resources
   - By fiscal 2000, achieving a 10% reduction in computer and copy paper compared with fiscal 1995 levels.
   - Recycling 100% of used paper by fiscal 2000.
   - Using only recycled paper by fiscal 2000.
6. Upgrading Emergency Response Capabilities
   - Sony will institute a comprehensive response system to deal with natural emergencies, prevent harm to the environment during a disaster, and enable a swift reaction to crises that affect both the company and the community at large.
7. "Green" Purchasing
   - All purchasing decisions for materials, parts, facilities and office equipment will place priority on ecological considerations.
8. Green Perspective in Plant Location and Overseas Expansion
   - Sony will fully take into account a range of environmental issues before building new plants, expanding or launching overseas operations, making any major revisions to the nature of its operations, or withdrawing from a particular field of business.
9. Introduction of "Green" Cars
   - As progress in ultra-low-pollution technology allows, the company will make use of electric cars and other low-pollution vehicles.

2
- Energy Consumption — FY1990 = 100 — FY2000: 25% reduction
- Volume of Waste — FY1991 = 100 — FY2000: 50% reduction

3

4
- Cadmium, Mercury, Chloromethylene, etc. — FY2000: Eliminated
- VOCs, Lead, etc. — FY1993 = 100 — FY1997 25% reduction — FY2000: 50% reduction

5
- Computer, Copy Paper — FY1995 = 100 — FY2000: 10% reduction
- Recycling of Used Paper — FY2000: 100%
- Use of Recycled Paper — FY2000: 100%

Reduction of the Environmental Impact of Products

1. Product Recycling 2000
   - All products sold after 2000 will incorporate parts and materials that facilitate easy recycling and reuse.
     1) Recycling. By fiscal 2000, making possible the recycling of 50% of the parts and materials that could not be recycled as of fiscal fiscal 1992.
     2) Dismantling. During the ten-year period ending in fiscal 2000, cutting in half the time needed to disassemble products to the point where recycling is possible.
     3) Styrene Foam. By fiscal 2000, halving the total volume of styrene foam used compared with fiscal 1990 levels.
2. Prevention of Global Warming
   - By fiscal 2000, reducing the power consumption of all major product types by 30% to 50% compared with the fiscal 1990 level.
3. Greenplus 2000
   - By fiscal 2000, all products made by Sony will reflect environmental considerations.

1
- Recycling Ratio — FY2000: 50% improvement — FY1992 = 100
- Dismantling Time — FY1990 = 100 — FY2000: 50% reduction
- Styrene Foam — FY1990 = 100 — FY2000: 50% reduction

2
- Major Product Types Produced — FY1990 = 100 — FY2000: 30%~50% reduction

Sony's Environmental Action Plan by Region

	Japan (as of Oct. 1, 1996)	Americas (as of Oct. 15, 1997)	Europe (as of May 15, 1997)	Asia (as of Sep. 15, 1997)
Industrial waste/ recycling	• Fiscal 2000: 50% reduction vs. fiscal 1991 • Fiscal 2010: Elimination of waste sent to landfills	• Work toward recycling of 80% of waste (no target date has been set)	• Fiscal 2000: 20% reduction vs. fiscal 1995 • Fiscal 2010: Recycle more than 80% of waste	• Fiscal 2000: 25% reduction vs. fiscal 1996 • Fiscal 2005: 50% reduction in waste sent to landfills vs. fiscal 1996
All releases (incl. waste) to water, air and soil	• Not applicable	• Annual reductions of 5% per year from fiscal 1998 to fiscal 2002	• Not applicable	• Not applicable
Energy consumption	• Fiscal 2000: 25% reduction vs. fiscal 1990	• Annual reductions of 2% per year from fiscal 1998 to fiscal 2002	• Fiscal 2000: 15% reduction vs. fiscal 1995	• Fiscal 2000: 10% reduction vs. fiscal 1996
Resource conservation – Paper	• Fiscal 2000: 10% reduction vs. fiscal 1995 • Used-Paper Recycling-fiscal 2000: Recycle 100% of used paper • Use of Recycled Paper-fiscal 2000: Use only recycled paper	• Promote paper recycling programs	• Fiscal 2000: 5% reduction vs. fiscal 1995	• Fiscal 2000: 10% reduction vs. fiscal 1996 • Used-Paper Recycling-fiscal 2000: Recycle 70% of used paper • Use of Recycled Paper-fiscal 2000: Use 70% recycled paper
Resource conservation – Water	• Promote water conservation programs	• Annual reduction of 2% in water consumption	• Not applicable	Promote water conservation programs
"Green" purchasing	• Set standards for procurement of office supplies and materials	• Set standards for procurement of office supplies	• Set standards for procurement of office supplies and materials	• Set standards for procurement of office supplies and materials
Dismantling time	• Fiscal 2000: 50% reduction vs. fiscal 1990	• Not applicable	• Fiscal 2000: 50% reduction vs. fiscal 1990	• Not applicable
Energy-efficient products	• Fiscal 2000: 30% to 50% reduction vs. fiscal 1990	• Fiscal 2002: Apply Energy Star standards to TVs and VCRs in addition to computers, monitors and printers	• Fiscal 2000: 30% to 50% reduction vs. fiscal 1990	• Not applicable
Higher product recycling ratio	• Fiscal 2000: 50% improvement vs. fiscal 1992	• Product stewardship: Recycle 100% of defective products, collect and recycle 98% of products returned by users	• Fiscal 2000: 50% improvement vs. fiscal 1992	• Not applicable
Styrene foam	• Fiscal 2000: 50% reduction vs. fiscal 1990	• Not applicable	• Fiscal 2000: 50% reduction vs. fiscal 1992	• Not applicable
Pollutants to be eliminated	• Fiscal 2000: Total elimination	• Fiscal 2000: Total elimination	• Fiscal 2000: Total elimination	• Fiscal 2000: Total elimination
Pollutants to be reduced	• Fiscal 2000: 50% reduction vs. fiscal 1993	• Annual reductions of 2% per year from fiscal 1998 to fiscal 2002	• Fiscal 2000: 30% reduction vs. fiscal 1995	• Fiscal 2000: 25% reduction vs. fiscal 1996
Highlights	1) Setting of numerical goals that can serve as standards for other regions 2) The goal to eliminate waste sent to landfills by 2010 is more ambitious than in other regions.	1) Prepare a clear action plan and procedures in concert with safety and hygiene standards 2) Set goals for annual reductions over a five-year period rather than a goal for 2000. 3) Set cost goals for recycling (annual growth of 10% in revenues from recycling over a five-year period and annual reduction of 5% in waste disposal costs 4) Set a numerical goal for water utilization, the only region to do so.	1) Except for figures, items are basically identical to those for Japan. 2) A checklist is produced for all related divisions and departments. 3) Establishment of a European Auditor Network to permit the assignment of internal auditors to different plants.	1) Except for figures, items are basically identical to those for Japan. However, there are no goals for items related to product development. 2) Years used as standards for reductions are close to those for goals (mostly 1996 to 2000). 3) Numerical goals have been set for the recycling of used paper and use of recycled paper. Only Japan does the same.

Progress Review

Progress and Self-Assessments of Environmental Action Plans

An April 1999 review of the four regional environmental action plans showed that all regions are making steady progress toward their respective goals. However, improvements are required in the following two areas:

1) While some variations in targets are inevitable due to local regulations, the Sony Group needs to work harder at establishing uniform goals for all regions.
2) Numerical data for some items are insufficient. The Sony Group needs to quickly establish a system for gathering more detailed data and improve the reliability of that data.

Note: China is under the jurisdiction of the ECC (Japan) but is included in Asia in this publication.

Reducing the Environmental Impact of Business Processes

	Japan	Americas
ISO-14001 Certification	• Manufacturing bases: all 38 sites. • Non-manufacturing bases: 5 of 42 sites	• Manufacturing bases: 20 of 28 sites in 1997 • Non-manufacturing bases: 0 of 19 sites
Environmental Audits	• All manufacturing bases have been audited and follow-up audits are performed every 3 years. • At non-manufacturing bases, initial audits are implemented following acquisition of ISO-14001 certification.	• Environmental audits started in 1985, the earliest of all four regions. In 1998, the EEC (Americas) performed 53 environmental audits.
Global Warming (Energy Conservation)	• Fiscal 1997: Improvement from 38% in fiscal 1993, when action plan was established, to 10% in ratio of crude oil equivalent energy consumption per sales vs. fiscal 1990	• Installing highly efficient lighting, HVAC and other systems and replacing low-efficiency equipment with modern technology.
Waste Disposal	• Fiscal 1997: 55% reduction vs. fiscal 1991 in ratio of waste volume to net sales.	• Recycled 66% of waste in fiscal 1996 and 71% of waste in fiscal 1997 with a target of 80%.
Hazardous Materials	• Fiscal 1997: 4.2% reduction in Class III chemicals (targeted for reduction) vs. (340 tons) fiscal 1996 and 59% reduction (11,200 tons) in class IV chemicals.	• Fiscal 1997: Class III chemicals increased by 76 tons, or 3%, mainly due to a new CRT class plant, and Class IV chemicals increased by 1,860 tons, or 36%, both vs. fiscal 1996.
Emergency Response Capabilities	• In addition to ISO-14001 drills, emergency response drills were conducted as part of "Environment Month" activities in June 1998. • Audits stressing environmental risk prevention systems are conducted when ISO-14001 certification is reviewed every three years.	• Emergency response readiness is rigorously checked during environmental audits. • All 53 environmental audits last year included risk management measures.
"Green" Purchasing	• Green purchasing guidelines were established for office supplies in fiscal 1996. Based on these guidelines, an ecological product purchasing code has been added to Sony's computerized purchasing system.	• Green purchasing standards were established in fiscal 1997 for office supplies.
Paper	• Paper reductions: Use has been cut by an average of 12%. • Paper recycling: An average of 78% of paper is recycled. • Recycled paper: Accounts for an average of 91% of paper use.	• Special attention has been paid to the use of paper since fiscal 1996, although no numerical targets are in place.
Plant Locations	• For a new plant in Nagasaki, the company conducted preliminary surveys and an environmental assessment. • A facility to prevent the runoff of chemicals was constructed together with the new plant of ST-LCD.	• Plant location standards are included in environmental audits.

Reducing the Environmental Impact of Products

	All Regions
Recycling	• As of March 1999, the possible recycling rate had reached about 60% based on a simple average for the primary models of each major product category.
Dismantling	• As of March 1999, the dismantling time had been reduced by 40% to 70% for the primary models of each major product category.
Styrene Foam	• As of March 1998, styrene foam utilization had been reduced by about 40%. • As of March 1999, no styrene foam at all was used in the Walkman and PC categories. • Some camcorders and automotive products now use no styrene foam as Sony steadily expands the scope of styrene-foam-free products. • In 1998, Sony won an international packaging award for having developed a packaging concept that eliminates the need for styrene foam to package video decks. • A 30% reduction has been achieved for TVs and models are now being marketed that are packed using styrene foam recycled by limonene.
Global Warming	• TV energy consumption has been reduced by about 22%. • Standby mode power requirements in video decks, the major source of power consumption, has been cut by about 50%. • For high-end audio equipment, Sony achieved an industry first in the spring of 1998 by marketing a product with standby power consumption of less than 3 watts. • Power consumption has been cut by 50% to 90% in Walkman products and camcorders.
Greenplus 2000	• Since 1998, product planning documents include environmental items, thereby creating a system even better able to verify environmental performance at the design stage. • As of March 1999, about 70% of the major components of TVs, video decks and audio equipment conform to Greenplus standards. • From fiscal 1999, targets will be reestablished for each product category and related projects will continue to be implemented.
"Green" Purchasing	• 56 substances contained in materials and parts have been designated by Sony as environmental sensitive. • Sony is creating a database of environmentally sensitive substances contained in the parts purchased for use in finished products.

Europe	Asia	Overall
• Manufacturing bases: 11 out of 12 sites • Non-manufacturing bases: 6 out of 19 sites	• Manufacturing bases: 18 out of 22 sites • Non-manufacturing bases: 7 out of 16 sites • Chinese manufacturing: 4 out of 6 sites	• Certification has been obtained at 109 sites worldwide • Manufacturing bases: 91 out of 106 sites • Non-manufacturing bases: 18 out of 98 sites • Certification is progressing largely as planned
• The ECC (Europe) has conducted an environmental audit at all manufacturing bases with the exception of one new factory during the past year.	• Environmental audits were conducted at 5 manufacturing sites during the past year. • In China, environmental audits were conducted at 4 manufacturing sites.	• A system is in place to implement environmental audits at all Sony sites. • Sony plans to expand the scope of environmental audits.
• Fiscal 1997: 25.5% improvement vs. fiscal 1995 in ratio of crude oil equivalent energy consumption per sales. • Absolute energy consumption increased 10.7% vs. 1995 due to an increase in production.	• Fiscal 1997: 32% improvement vs. fiscal 1996 in consumption of electricity	• Improvements have been achieved in all regions following the establishment of the respective action plans. Targets in Japan have been revised to conform to an industry association's target of cutting unit CO_2 emissions by 25% by fiscal 2010.
• Fiscal 1997: 15.0% reduction vs. fiscal 1995 in ratio of waste volume to net in sales.	• Fiscal 1997: 8% reduction in volume vs. fiscal 1996	• Waste volumes are being reduced steadily in all regions. Steps are now being taken to achieve even more ambitious targets.
• Fiscal 1997: 870 ton increase in Class III chemicals and 1,740 ton reduction in Class IV chemicals vs. fiscal 1996. Class II chemicals were eliminated.	• Fiscal 1997: 310 ton increase in Class III chemicals and 75 ton reduction in Class IV chemicals vs. fiscal 1996.	• Fiscal 1997: 7.5% increase (920 tons) in Class III chemicals and 38% reduction (11,190 tons) in Class IV chemicals vs. fiscal 1996. Sony is placing priority on switching to substitutes for Class III chemicals and developing related technologies.
• There is no risk asessment at all companies. However, this process has been instituted in fiscal 1998 at four factories in Europe.	• Environmental audits cover risk management.	• Sony is now preparing environmental risk assessment standards to be applied to all companies worldwide. • Sony needs to monitor more accurately the implementation and content of risk assessments.
• Guidelines for non-production materials were established in 1997 and implemented in June 1998.	• Guidelines for office supplies were established in fiscal fiscal 1997.	• A system for green purchases of office supplies is largely complete. Similar systems for office equipment and other facilities will be enacted in the near future.
• Paper consumption was cut by an average of 39% at manufacturing sites.	• 30% utilization of recycled paper • Programs to reduce paper consumption	• Paper reduction and recycling programs are being implemented by each Sony site. • The next stage will be a numerical system to permit the detailed management of paper-related programs.
• Although this item is not included in the action plan, environmental considerations were taken into account before constructing a plant in Hungary and a new Sony complex in Berlin.	• The location of a CRT plant in China was changed because a waste water outlet would have been upstream from a drinking water intake.	• Environmental factors will continue to play a role in the selection of locations for Sony plants and other facilities.

Green Management 2002

Green Management 2002

Green Management 2002-the new Medium-Term Environmental Action Plan:

In November 1998, the Sony Group formulated Green Management 2002, the company's new Medium-Term Environmental Action Plan. This initiative is based on a review of Green Management 2000 and the action plans for each of the four geographic regions. The new plan has three key differences:

1) The plan has been extended by 2 years through 2002.
2) Goals and other elements of the plan are uniform for all areas of the world except where impractical due to laws, regulations or other factors unique to each area.
3) The action plan now covers a much broader range of activities. Among the newly included fields are sales and promotional activities, public relations, communications, training and accounting.

The primary aspects of Green Management 2002 are as follows.

1. *Objective*

- This environmental action plan was created to serve as a guide for concrete environmental activities that conform to Sony's Global Environmental Policy. Specific goals are provided to set forth clear guidelines for such activities.

2. *Scope*

- This environmental action plan is applicable to all business activities of Sony and each member of the global Sony Group. Sony Group members are defined as companies and joint venture companies in which Sony has an equity interest of more than 50%.

3. *Establishment and Operation of Environmental Management System*

- Put in place by the end of fiscal 2000 an environmental management system at every base that exceeds a specified scale.
- Conduct environmental audits.

4. *Observance of Environmental Laws*

- Strictly adhere to all environmental laws, regulations and self-imposed standards.

5. *Reflect Environmental Issues at All Sony Work Sites*

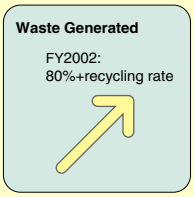
- Take steps to reduce waste, conserve energy and cut down the use of resources at all Sony work sites.
- Enact pilot waste reduction programs.
  1) By the end of fiscal 2000, the Environmental Conservation Committee (Japan) will conduct a pilot program at two plants in Japan with the aim of completely eliminating* discarded waste materials.
  2) By the end of fiscal 2002, each Sony company will conduct a program aimed at completely eliminating* discarded waste materials. This program is to cover at least one work site in Japan and one work site outside Japan.

  * In this case, "completely eliminating discarded waste materials" means that 95% or more of waste materials are reduced in volume or reused as a material to make products or recycled in some other way.

• Waste Materials

Japan

Americas

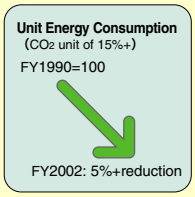


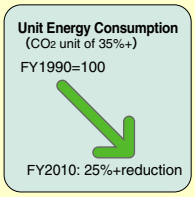
Europe

Asia

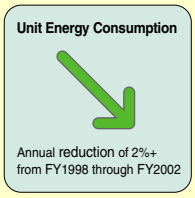
• Energy Conservation

Japan

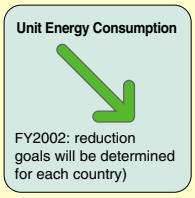




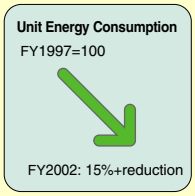
Americas



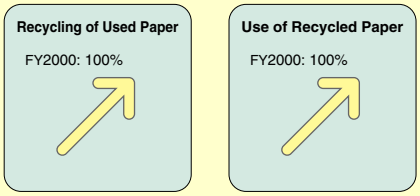
Europe

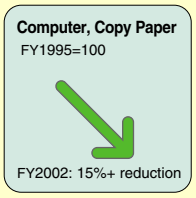


Asia



• **Efficient Use of Paper**





6. *Reflect Environmental Issues in R&D Activities*

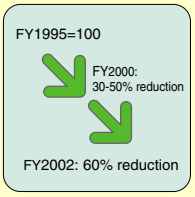
- Reduce energy consumption and generation of greenhouse gases.
- Work on recycling technologies.
- Work on methods to use substitutes for harmful substances or render such substances harmless.
- Study environmental evaluation technologies and related topics.

7. *Reflect Environmental Issues in Product Development*

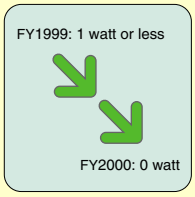
- Demands Placed on Products
  1) Promote Greenplus 2000
     Make all products environmentally compatible by 2000.
  2) Extend useful product lives
     Improve reliability and repair services with goals in 2000 and 2002.

Specific Requirements

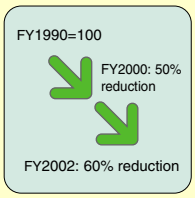
Power Consumption



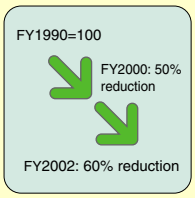
Standby Power Consumption



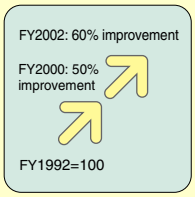
Styrene Foam



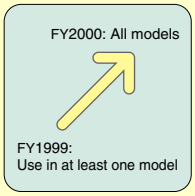
Dismantling Time

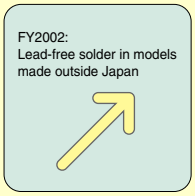


Possible Recycling Rate

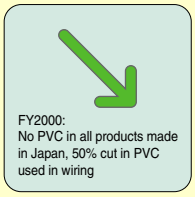


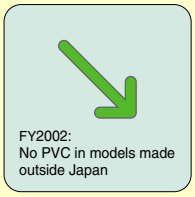
Lead-free-Solder



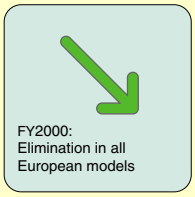


PVC Reduction





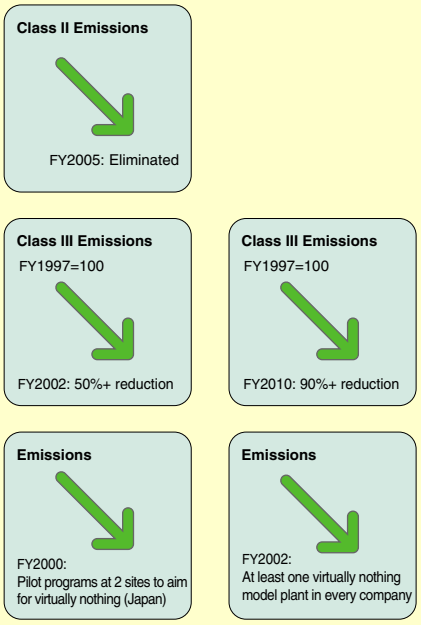
Elimination of Halogen Flame Retardants



Green Management 2002

8. *Reflect Environmental Issues in Production Processes*

- Reduce and eliminate the use of environmental pollutants



9. *Reflect Environmental Issues in Purchasing*

- Promote "green" purchasing methods.
- Environmental studies, training and support at vendors.

10. *Reflect Environmental Issues in Marketing Activities*

- Ensure that sales promotion tools are environmentally compatible and minimize waste generated by marketing-related events.

11. *Reflect Environmental Issues in After-Sales Service*

- Extend the length of time over which products can be repaired.
- Promote the recycling of materials in end-of-life products.
- Promote the collection of rechargeable batteries.
- Increase utilization of reusable components.

12. *Reflect Environmental Issues in Product Recycling*

- Formulate a product recycling action plan for each company.
- By April 2000, conform to recycling evaluation standards established by each company.
- Start operations at a pilot recycling plant in April 2000 (Display Company).
- Established a system in Japan for recycling packaging materials in March 1999.

13. *Reflect Environmental Issues in Distribution*

- Revise transportation systems to reduce emissions of gases that contribute to air pollution and global warming.
- Reduce materials used for transportation, increase use of recycled materials and develop more substitute materials
- Increase use of vehicles with a minimal environmental impact.

14. *Reflect Environmental Issues When Expanding and Revising Business Activities*

- Study environmental impact of plant locations, overseas business operations and any changes in operations.

15. *Prepare for Emergencies*

- Ensure that facilities and equipment are prepared for emergencies.
- Conduct training and drills to ensure that people and facilities are ready to respond to an emergency.
- Keep all communication and transportation routes in the optimum condition.

16. *Cooperate With Governments and Their Agencies*

- Participate in and extend full cooperation to the environmental programs of national and local governments, their agencies and other related bodies.

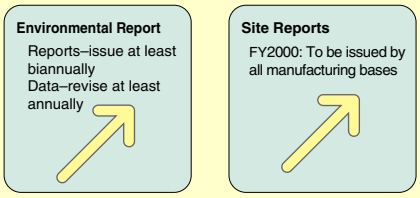
17. *Extend Support to Vendors and Other Business Associates*

- Provide assistance with regard to environmental technologies and environmental awareness efforts at companies with which the Sony Group does business.

18. *Public Relations*

- Make clear to all stakeholders Sony's accountability with regard to environmental matters.
- Disseminate the latest environmental information to all Sony employees.

19. *Environmental Education*



- All Sony Group employees shall take it upon themselves to be environmentally responsible at work, at home and in the community.
- Initiate environmental training programs for employees.

20. *Environmental Audits*

- Formulate an environmental auditing system to monitor the costs of environmental activities and determine the benefits generated by those expenses.

21. *Collection and Analysis of Environmental Data*

- Collect, analyze and disclose information for the purpose of achieving further reductions in Sony's environmental impact.

22. *Social Activities*

- Contribute to local environmental conservation programs as a responsible corporate citizen.
- Extend support to the environmental activities of employees.

Environmental Actions

Five main elements constitute Sony's environmental actions. Among them, the following three have a direct relationship with business operations:

1. Reduce the environmental impact of all business activities, especially manufacturing.
2. Reduce the environmental impact of all Sony products and recycle end-of-life products.
3. Fulfill Sony's social responsibility by conducting research and development programs in environmental fields

This section provides more information on how Sony is addressing each of these three areas. Examples are also provided of specific programs around the world. Although most business processes are not directly visible to customers, Sony leverages its environmental management system to lower the environmental impact of these processes. The impact of products is evaluated over the product's entire life cycle. Recycling at Sony takes many forms, but the Group has only started to make headway in the drive to raise collection and recycling rates. This is an area that holds much potential for further gains.

Business Processes

ENERGY CONSERVATION

● Prevention of Global Warming

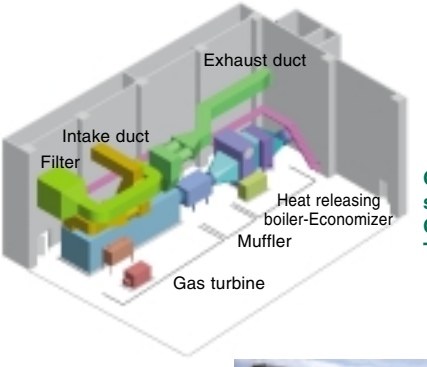
Reducing CO_2 emissions by conserving energy is the primary means by which Sony works to prevent global warming. Major business sites and factories in Japan and overseas are taking many steps to reduce energy conservation to meet targets set for 2002 by Sony's Environmental Action Plan. Measures under consideration include raising the efficiency of production processes, and installing energy-efficient equipment for heating, air conditioning, lighting and other needs. The exchange of information on ways to save energy and employee training in this regard are other measures being promoted.

• Japan

In line with the growth in the scale of Sony's operations, unit energy consumption (ratio of energy consumption per sales) and total energy consumption targets for which there are numerical targets rose during the period from 1990 to 1993. Beginning in fiscal 1993, implementation of the Environmental Action Plan reversed this trend; unit energy consumption has declined every year since. Sony plans to continue efforts aimed at cutting energy requirements.

The Sony Corporation Sendai Technology Center, is implementing a broad-based conservation program. A 4,000kW natural gas co-generation system that emits a minimal volume of CO_2 has been installed. This system simultaneously supplies electricity and heat for the center. Estimates place the annual energy saving at the equivalent of 2,000 to 3,000 kiloliters of crude oil. Additionally, an inverter for the clean room air conditioning system needs 60% less energy than the previous system did. In Japan, Sony installed 8 co-generation systems at 5 locations that can generate a total of 14,500kW of electricity.

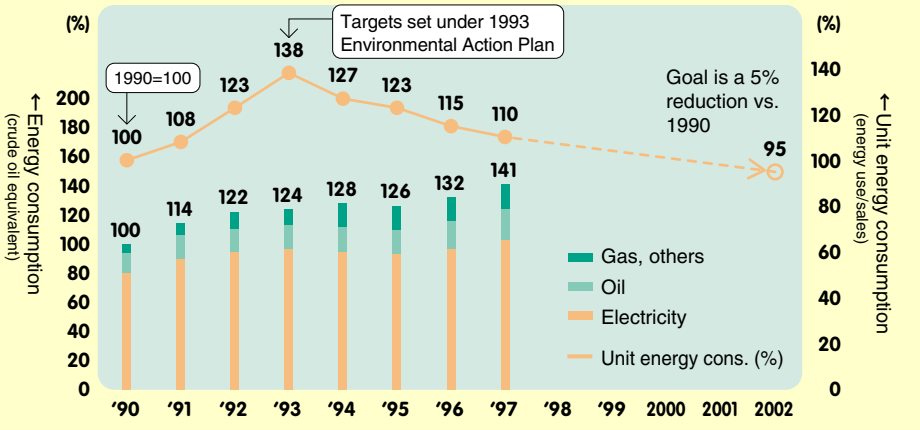
Also exemplifying the energy conservation drive is Sony Motomiya. The application of a reflective, insulative roof coating limits the rise in temperature inside the plant during the summer, thereby holding down energy needed for air conditioning. A new energy-efficient boiler makes this company still more environmentally compatible.



Co-generation system at Sony Corporation Sendai Technology Center

Reflective, insulative roof coating at Sony Motomiya

Energy Utilization at Domestic Sony Group (Years ended March 31)



• United States

Sony Electronics is a participant in two programs conducted by the federal Environmental Protection Agency (EPA): Green Lights and Energy Star Buildings. Numerous actions are being taken to cut the energy requirements of the company's buildings. Examples are a reflective roof coating to cut heating and cooling needs, variable-speed motors and skylights. By raising the efficiency of illumination systems alone, Sony Electronics achieved the equivalent of a 23,377-ton reduction in CO_2 emissions over the past 5 years.

At Sony Electronics' Technology Center-Pittsburgh, a sophisticated boiler, an efficient 2,000-ton cooling capacity chiller, a temperature and humidity control system and other equipment have shaved energy consumption by 3% to 5%.

The following table lists the benefits of Sony Electronics' five-year partnership with the EPA. In particular, Sony Electronics' U.S. operations have helped cut CO_2 emissions, one cause of global warming, by replacing older lighting technology with more efficient fixtures.

Equivalent Contributions of Adoption of Efficient Lighting Systems at Sony Electronics

Acres of trees planted	10,040
Cars removed from highways	7,453
Savings in electricity rates	$3,202,500
CO_2 emissions prevented	23,377 tons

• Europe

Sony Center Am Potsdamer Platz, a complex in the heart of Berlin that is slated to open in 2000, incorporates many energy conservation measures. Illustrating this are the heating and ventilation systems. Radiant heat and air conditioning, heat management technology and ventilation that combines natural and mechanical air flows all minimize energy needs. Heating and cooling systems draw on a district heating and cooling company that incorporates cogeneration technology, thereby cutting CO_2 emissions by 35%. Power used for lighting is also low. In limited access areas, motion sensors linked to security ID cards along with automatic switches ensure that lights and other electric equipment are switched on only when necessary. The use of natural light, rainwater and other resources cuts energy needs even more.

Sony Center Am Potsdamer Platz in Berlin
Photo: Rudolf Schaefer

• Asia

At the CRT plant of Sony Precision Engineering Center (Singapore), a circulation/recycling system for cleaning water used in the cooling tower and a filter to remove dust and raise efficiency of the heat exchanger have reduced the need for water by 10,650 cubic meters and lowered energy consumption by 1 million kWh annually.

The cleaning water filter and circulation/recycling system for the cooling tower

RESOURCE CONSERVATION

Used Paper

Since 1991, Sony has run a “Less Paper Campaign.” The goal is lowering requirements for computer and copy paper. This drive takes many forms. Two-sided copies, fewer paper-based documents at meetings and shorter reports are just a few examples. One idea is now firmly established as part of everyday business: using the blank sides of used paper to copy documents for internal distribution.

Green Management 2002 sets forth 3 goals with regard to paper:

1) A 15% reduction in computer and copy paper used by the end of 2002 compared with 1995.
2) Expand the collection of used paper by type to raise the paper reutilization rate to 100% by 2000.
3) Use recycled paper for all copy and computer paper, catalogs, instruction manuals and other publications by 2000.

Water

Among Sony’s manufacturing activities, the production of semiconductor wafers and CRTs require large volumes of water, primarily for cleaning. To use water responsibly, the Sony Group strives to recycle this precious resource wherever possible. At its semiconductor plant, Sony Nagasaki retreats and reuses most of the pure water employed for cleaning. Only small amounts of additional water are required. At the CRT plant of Sony Mizunami, a rainwater collection facility was installed many years ago. Equipment to process used water was installed in 1995. Currently, these two systems supply about 110,000 tons of water annually.

Similar programs are taking place outside Japan. At the CRT plant of Sony Display Device (Singapore), a sophisticated wastewater recycling facility was completed in July 1998 at a cost of S$7 million. This is expected to produce annual savings of S$1 million due to the reduction in water treatment chemicals and water consumption. Every hour, the system is capable of producing 150 cubic meters of cleaned/purified water with quality that is better than potable water.

At Sony’s Technology Center in San Diego, California, researchers worked with a local university to create the most efficient water recycling system possible. The result is a system that recovers water separately from each production step; processing can then be performed in the optimum manner for each level of water quality. The system produces clean, reusable water with an extremely high efficiency. Operative since 1996, the technology recycles approximately 80,000 tons of water every year.

The water reprocessing system of Sony Display Device (Singapore)

The water recycling system at Sony’s plant in San Diego, California.

In-Line Recycling of CD Molding Scraps

At CD plants, waste and defective items have in the past been recycled in the form of trays for CD singles. But at Sony DADC in Austria, polycarbonate scraps produced during the CD injection molding process have since 1997 been recycled within the same production line, a much more effective recycling system.

CD scraps are used again on the same production line.

INDUSTRIAL WASTE REDUCTION

Reducing Industrial Waste

Operating bases of the Sony Group throughout the world are promoting methods to reduce the generation of waste and increase recycling. The Sony Environmental Action Plan, "Green Management 2002," positions waste management as a top priority for every Sony operating base. Sony's ultimate goal is to bring down waste sent to landfills to as close as possible to zero. Specific initiatives include:

1) At two pilot plants in Japan, the Environmental Conservation Committee (Japan) will start a trial program by the end of 2000 that is designed to demonstrate how waste sent to landfills can be cut to virtually nothing.
2) Each Sony company will conduct a similar trial program, to be started no later than the end of 2002 in at least one plant in Japan and in one plant overseas, that aims to cut waste sent to landfills to virtually nothing.

In this discussion, "virtually nothing" means that at least 95% of waste materials will be processed internally or recycled by Sony or elsewhere. Complete elimination of discarded waste materials is not an environmentally responsible goal because of the large volumes of energy required to recycle certain substances.

Industrial Waste Reduction Targets by Region

Region	Targets
Japan	2002: Reduction of more than 50% vs. 1997 (ratio of waste to net sales) 2010: Reduction of waste sent to landfills to virtually nothing
Americas	2002: Raise recycling rate to more than 80%
Europe	2002: Reduction of more than 40% vs. 1995 (ratio of waste to net sales)
Asia	2002: Reduction of more than 40% vs. 1996 (ratio of waste to net sales)

Note: Please refer to the data sheets included with this report for details on industrial waste, recycling, processing and other items by geographic region.

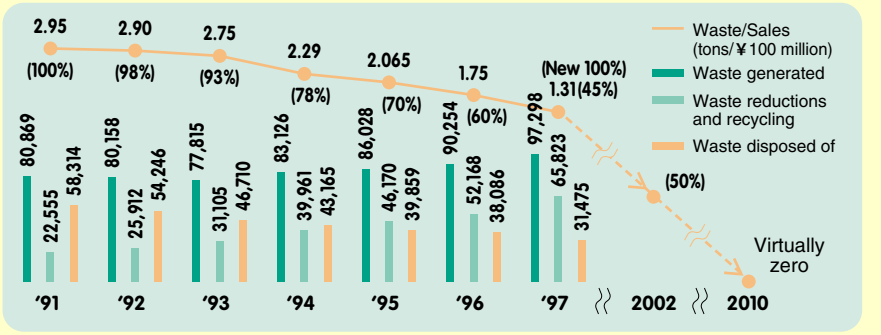
Waste Reduction and Recycling Programs

A number of materials account for a large share of waste produced by the Sony Group: cardboard and plastic packaging materials; organic solvents used to make magnetic tape; acidic and alkaline compounds and sludge produced from water treatment at semiconductor and CRT plants; and glass at CRT plants. Various initiatives have resulted in lower waste volumes and gains in recycling. Among these programs are:

Cardboard ..... Used to make recycled cardboard
Plastic packaging materials ..... Used repeatedly, used in steelmaking, recycled to produce other materials
Organic solvents ..... Recovered and reused
Acids and alkalines ..... Concentrated to reduce volumes
Water treatment sludge .... Used as a feedstock for cement
CRT glass ..... Pulverized and reused

Sony business locations around the world are establishing environmental management systems that conform to ISO-14001 standards. Each location sets its own targets and takes the steps needed to fulfill them. Sony is studying ways to handle materials that cannot yet be effectively treated or recycled. One of the most difficult is composite plastics. Discovery of a means to handle these plastics is essential if Sony is to realize its goal of bringing discarded waste down to virtually nothing. Sony is thus studying many possible ways to solve this challenging problem.

Waste Management at Domestic Sony Group (Years ended March 31)



Recovered acid concentrating system (Sony Kokubu)

REDUCTION AND MANAGEMENT OF CHEMICAL SUBSTANCES

Reducing the Release of Chemicals

In April 1993, Sony stopped using all chemicals identified as being harmful to the ozone layer at its then 70 manufacturing sites around the world. Among these compounds were first-generation chlorofluorocarbons (CFCs) and trichloroethane. Sony thus eliminated the use of these chemicals two years and eight months before the January 1996 deadline mandated by an international agreement.

Eliminating ozone-depleting substances called for numerous actions. One was the formation of the CFC Countermeasures Committee in April 1989 to centralize the handling of CFC-related information for Sony's global manufacturing bases. Another notable step was a system under which individual business categories and companies competed against one another to develop substitutes and process improvements. The result was a series of new technologies and an efficient horizontal development program. An Environmental Management Committee was formed in April 1998 and work is progressing on comprehensive measures to deal with releases of chemicals.

Management of Chemicals

Having eliminated CFCs, Sony has turned its attention to the management of potentially harmful compounds used in production activities. Research is also progressing on ways to reduce or eliminate the use of these compounds. Although regulations governing these compounds differ from country to country, Sony's manufacturing processes are basically the same all over the world. Thus, Sony is implementing a global management system for chemicals that is as uniform as possible. Phase I of this system extends from 1993 to 2000. The second phase is slated for completion in 2010. The basic objectives are as follows.

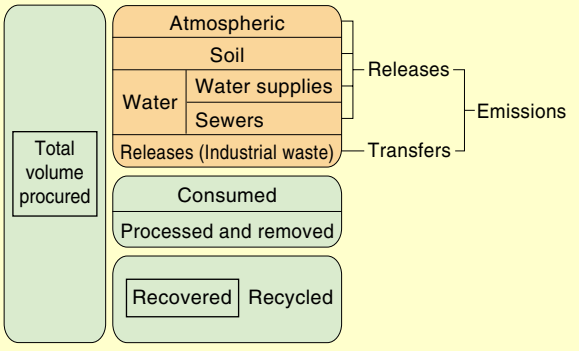
The PRTR (Pollutant Release and Transfer Registers) system promoted by the OECD member nations will play an important role in Sony's efforts to upgrade the management of chemicals. Under this system, Sony regularly measures and otherwise monitors emissions of all chemicals used in its operations. Such emissions encompass the release of such substances into the air, water and earth, as well as the release of environmental pollutants contained within waste materials.

The use of second-generation HCFCs is falling. Sony will prohibit their use in all non-coolant applications from April 2001. HCFCs will be used as a refrigerant until 2010, after which additional purchases will be banned.

Aiming for "Zero-emissions"

Sony's ultimate goal in its environmental activities is "zero-emissions," the complete elimination of emissions of environmental pollutants. To achieve this goal, the following program has been set in motion:

Procurement vs. Emissions



Notes: 1. Releases: Releases to the air, water and earth
2. Transfers: waste sent to another company for the purpose of intermediate processing or placement in a landfill.
3. The volume of consumption refers the volume of materials that are transformed into other compounds through chemical reactions, included in products and otherwise used in the production and delivery of products.
4. Processing and removal includes neutralization, dismantling, incineration and similar methods.

Measures to Deal with Potentially Harmful Substances

Class	Phase I (1993-2000)	Phase II (2001-2010)
I (Prohibited)	Prohibit use in production processes (14 substances)	Prohibit use in production processes (19 substances)
II (Elimination)	Eliminate by 2000 (6 substances)	Eliminate by 2005 (6 substances)
III (Reduction)	25% reduction by 1997 (13 substances)	50% cut in emissions by 2002 (21 substances)
	50% reduction by 2000 (13 substances)	90% cut in emissions by 2010 (21 substances)
IV (Controlled)	Use only in accordance with laws and regulations and under strict supervision (about 300 substances)	Use only in accordance with laws and regulations and work to reduce emissions (about 300 substances)

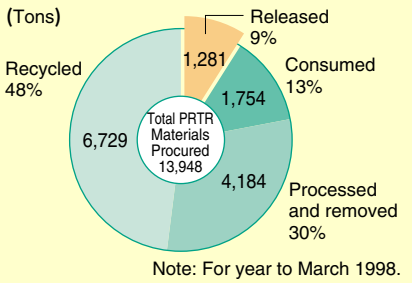
1. At two pilot plants in Japan, Sony is conducting a trial program that will bring emissions down to virtually zero by March 2001.
2. Each Sony company will designate at least one model operating site each in Japan and overseas by March 2003 for trial programs aimed at bringing emissions down to virtually zero.

● PRTR (Pollutant Release and Transfer Registers)

Sony has completed a PRTR survey at 40 of its locations in Japan and, through the Japan Electronic Machinery Industry Association, submitted a report to the Japan Federation of Economic Organizations (Keidanren). Based on the 1997 report, Sony was handling 31 of the 179 substances covered by this survey. During this year, 1,281 tons of such substances were released into the air, water or earth and incorporated in industrial waste. Organic solvents like toluene and xylene accounted for 78% of this volume. Sony is studying methods to replace these substances with more benign compounds and to bring down the level of emissions.

Among the OECD countries, many industrialized nations have systems* in place to register movements of waste chemicals. Now Sony's operations in Asian nations need to

Sony PRTR Survey Results in Japan



Notes: 1. Of the 179 substances covered by PRTR, Sony handles 31.
2. Results are for 40 business locations in Japan.

Notes: 1. Overall, 18% of "greenhouse" materials, atmospheric pollutants and VOCs that Sony purchases are eventually released into the environment in some form.
2. "Greenhouse" materials, atmospheric pollutants and VOCs account for 80% of all Sony environmental emissions and releases.
3. As a share of Sony's purchases, 6.5% of heavy metals are released into the environment. Heavy metals include nickel, copper, chrome, zinc, silver, cobalt, manganese and similar elements.

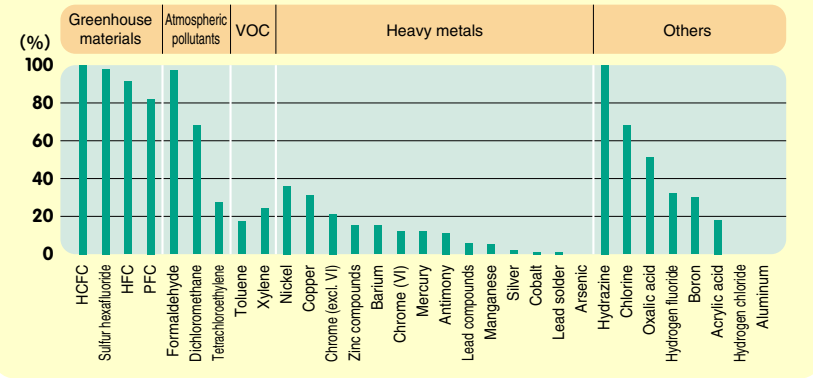
Composition of Emissions and Releases at Sony Japan Locations

	Material	Volume handled (tons)	Volume released (tons, %)		Share released (%)
Greenhouse materials	HCFC	0.7	0.7	0%	100%
	Sulfur hexafluoride	4.1	4.0	0%	98%
	HFC	1.3	1.2	0%	91%
	PFC	29.4	24.2	2%	82%
Atmospheric pollutants	Formaldehyde	14.0	13.6	1%	97%
	Dichloromethane	7.4	5.0	0%	68%
	Tetrachloroethylene	5.2	1.4	0%	27%
VOC*	Toluene	5,561.5	968.4	76%	17%
	Xylene	96.1	23.1	2%	24%
Heavy metals	Nickel	30.0	10.8	1%	36%
	Copper	23.0	7.2	1%	31%
	Chrome (excl. VI)	33.1	6.9	1%	21%
	Zinc compounds	219.5	32.6	3%	15%
	Barium	10.2	1.5	0%	15%
	Chrome (VI)	0.5	0.1	0%	12%
	Mercury	1.1	0.1	0%	12%
	Antimony	57.7	6.3	0%	11%
	Lead compounds	250.8	15.4	1%	6%
	Manganese	465.1	23.1	2%	5%
	Silver	38.8	0.8	0%	2%
	Cobalt	280.4	3.6	0%	1%
	Lead solder	277.7	1.9	0%	1%
	Arsenic	0.4	0.0	0%	0%
Others	Hydrazine	5.3	5.3	0%	100%
	Chlorine	2.2	1.5	0%	68%
	Oxalic acid	1.9	1.0	0%	51%
	Hydrogen fluoride	275.6	89.5	7%	32%
	Boron	14.5	4.4	0%	30%
	Acrylic acid	3.4	0.6	0%	18%
	Hydrogen chloride	6,223.1	26.6	2%	0%
	Aluminum	13.7	0.0	0%	0%
	Total	13,948	1,281	100%	9%

Note: Volatile Organic Compounds. These compounds are converted into photochemical oxidants in the presence of nitrous oxides and ultraviolet light.

Composition of Emissions and Releases in Japan

Emissions/Total volume handled



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establish a similar framework. Recognizing this need early on, Sony in 1993 initiated a global survey of its hazardous chemical utilization. Sony releases this data to the public annually in its Report on Environmental Pollutants.

* For example, Sony maintains a Toxic Release Inventory in the U.S. and operates it under the 313 articles of the "right-to-know" legislation.

● Bringing PRTR to Asia

Looking ahead, Sony plans to work toward the adoption of the PRTR system throughout Asia as a means to cut down the use of hazardous chemicals. Singapore is the first step. Training and monitoring activities will start here with the aim of establishing a common ground for the adoption of PRTR in neighboring countries.

● Sony Manufacturing Captures U.K. Environmental Awards

A breakthrough in a PC board soldering process at Sony Manufacturing Co., Inc. in the U.K. earned recognition in the form of The Queen's Award for Environment in 1997. Sony Manufacturing approached a waste issue from a different angle. Rather than studying ways to treat waste materials, the company focused on a method to reduce the generation of waste. Among the results were:

- An 85% reduction (10,000 kg) in solder oxides
- A 55% reduction (25,000 liters) in solvent usage
- A more than ten-fold improvement in soldering quality and durability
- An 80% reduction (£260,000) in maintenance requirements for soldering equipment

These achievements led to one more prestigious award: "Top Large Company Award" category of the 1998 Wales Inaugural Environmental Award.

Sony Manufacturing receives The Queen's Award

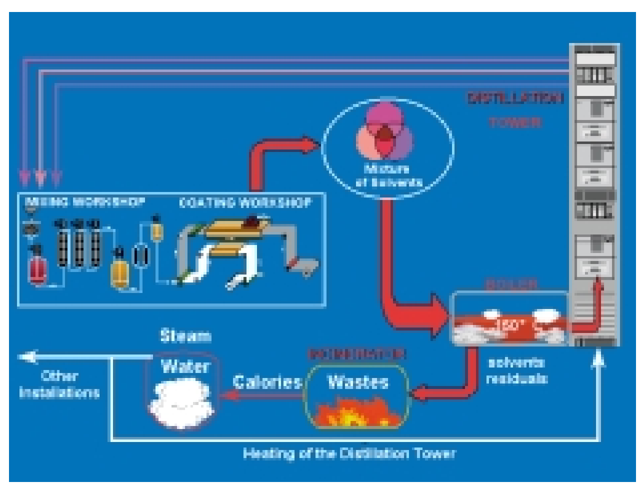
● Sony France DAX Plant

Ace Trophy Awarded by France's Sud-Ouest Newspaper

On November 17, 1998 in France, Sony REPF was awarded an Ace Trophy in the environmental protection category. A newly inaugurated competition, this event evaluates well-known companies operating in the Pays Basque region of France in a number of categories. Sony was nominated in the environmental protection category along with Acierie de l'Atlantique and LBC Sotrasol. Judging was based on the environmental policies of each company, internally developed technologies, and the management, reduction and recycling of waste.

Solvent Recycling

Sony's DAX plant in France, a major supplier of magnetic tape, implements many initiatives to reuse and recycle solvents. In March 1996, the plant received the 1995 Regional Environmental Contribution Award for industrial companies. The plant subsequently raised the solvent recycling ratio from 60% to 70%; the remaining 30% is reused in a manner that cuts the plant's energy requirements.



Solvent recovery process at Sony DAX plant in France

● Use of Chemicals at the Sony Group

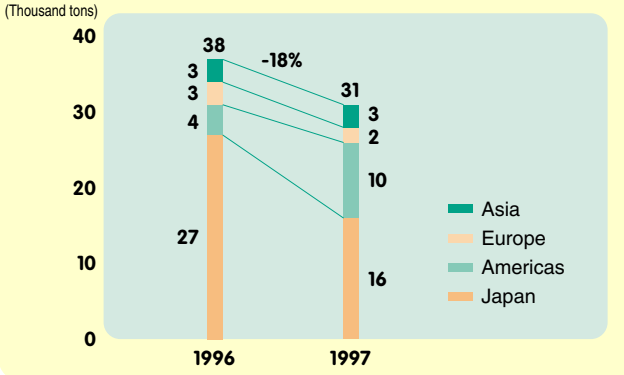
Sony's initiatives over the years have led to a reduction in the use of class I through IV pollutants from 38,000 tons in 1996 to 31,000 tons in 1997, a decrease of 18%.

As shown below, Sony is still using some class I and II compounds. The use of trichloroethane, a class I substance, is due to Sony's purchase of a plant in San Antonio, Texas from another company, and subsequent discovery of trichloroethane use on this line. Sony Music Entertainment uses trichloroethylene. In Japan, Sony will eliminate in 2000 the use of tetrachloroethylene, a substance used for applications where replacement with a substitute is difficult. Work is proceeding to eliminate this substance along with all class II pollutants as soon as possible.

Heavy metals and volatile organic solvents (VOC) represent most of the class III materials. Unfortunately, the use of these substances is rising outside Japan as Sony expands production activities. Sony is studying the use of substitute materials and other means to deal with this issue.

Regarding class IV materials, Sony was able to achieve a substantial reduction, cutting consumption from 25,700 tons in 1996 to 18,000 tons in 1997. Refer to the materials provided with this publication for more information.

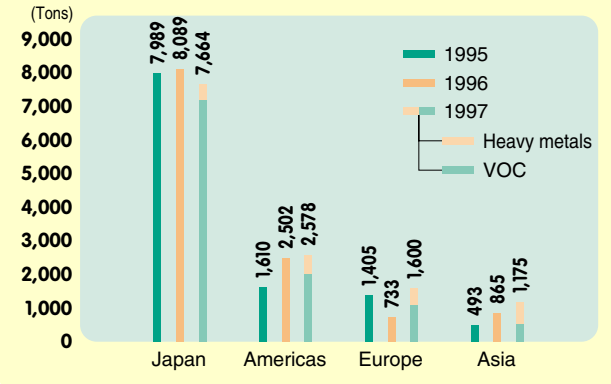
Chemical Use at the Sony Group
Total of Class I~IV Chemicals



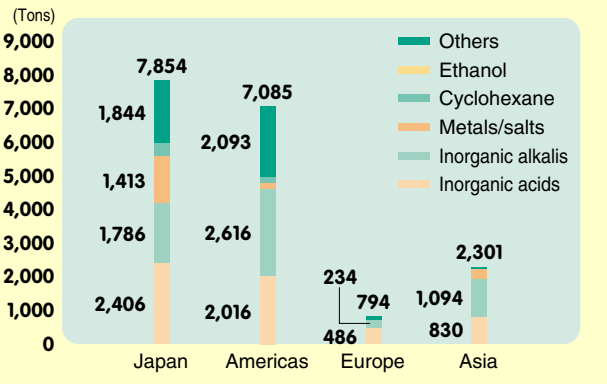
Class I Chemicals Use in 1997 (To be prohibited) and Class II (To be eliminated)

Class	Region	Substance	Volume used (tons)
I	Americas	Trichloroethane	0.03
		Trichloroethylene	0.7
	Japan	Tetrachloroethylene	1.4
II	Japan	Methylene chloride	28.3
		Inorganic mercury	1.0
	Asia	Methylene chloride	111

Class III Chemicals (To be reduced)



Class IV Chemicals Use in 1997 (To be closely controlled)



ENVIRONMENTAL AUDITS AND RISK MANAGEMENT

● Environmental Audits and Risk Management

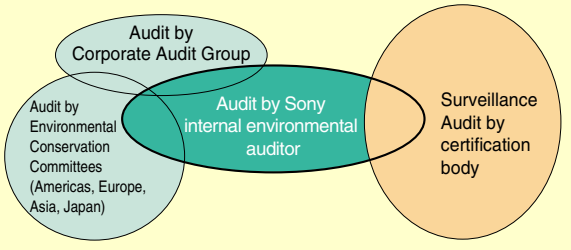
1) Environmental Audits

Audit Framework

Sony regards audits as an essential element of its ability to conduct an effective environmental management system. Numerous systems are in place to guarantee that inspections are performance in a completely reliable manner. Most important of all is maintaining a comprehensive internal auditing capability at each Sony business location. To ensure this capability, the Sony Group conducts its own training sessions. More than 2,000 employees have been certified as environmental auditors: 183 in the U.S., 62 in Europe, 245 in Asia and 1,600 in Japan.

Supplementing internal audits are objective inspections conducted by external organizations. This supplies input from a completely impartial source. A certification organization conducts surveillance audits, teams from each regional Environmental Conservation Committee conduct on-site inspections, and special auditors from the head office perform inspections on specific topics as needed. By using these resources in concert, Sony aims to establish an environmental management system that covers every necessary point.

The Sony Environmental Auditing System



Environmental Auditing Programs

ECC audits are conducted by the Sony Group within each of its four geographic regions: Americas, Europe, Asia and Japan. The Americas has a particularly long history, having started such audits in 1985 with the support of the legal department. By combining technical advice with legal counsel, the program is structured to provide each facility with a better understanding of its environmental and safety obligations. Audits supply business planners with the information needed to evaluate compliance costs for existing and future regulations and to operate each site in the best manner possible.

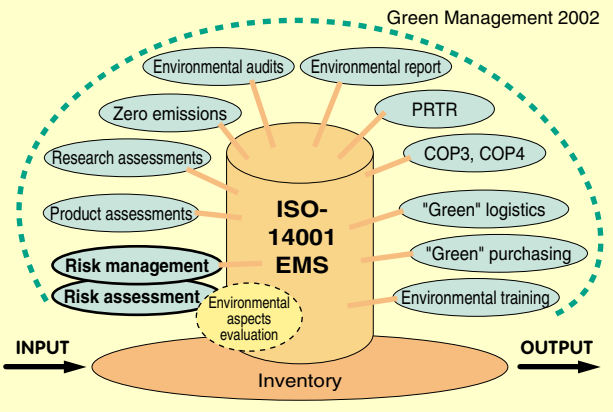
The program goes beyond the scope of legal matters. Many other aspects of environmental affairs are also reviewed: voluntary actions; how facilities are managed; problems that may surface at a later date; environmental compatibility of future expansions; the suitability of work practices, and much more. Public disclosure of this information makes it possible for all interested parties to make use of this valuable information. To ensure fairness, analysis is conducted in concert with discussions with key personnel at each business location. Through this auditing system, which is designed to supply highly practical information, the Sony Group is working to bring about continuous improvements in its environmental management activities.

An environmental audit by ECC (Americas)

2) Environmental Risk Management

The Sony Group conducts a comprehensive risk management program that embraces estimates, assessments and management of risks and is based on ISO-14001 environmental management systems. Preparations for responding

ISO-14001Comprehensive Environmental Management System



to environmental emergencies are evaluated in accordance with input and output (inventory) data for each operating base. This permits the estimate of risks and the determination of priorities for the necessary countermeasures.

● Facilities Criteria and Emergency Drills

A significant share of environmental risks are shared by many of Sony's businesses. Among these risks are:

1) Chemical spills entering storm sewers
2) Leakage and spills in the vicinity of chemical storage tanks
3) Releases and leakage of harmful waste materials from primary waste storage sites

Sony has developed its own standards for the systems needed to deal with these kinds of risks. At locations where potential danger is significant, investments are made as needed to install facilities to minimize applicable risks. Training programs complement these investments, another way in which Sony strives to conduct a seamless risk management system.

Oil spill drill at Sony Toyosato

Table for Small-Scale Non-Manufacturing Bases

Industry	Personnel on site	Chemicals used	Vehicles used	Paper used	Power consumed annually
Research, development & design of hardware	Under 50 people	Under 2 tons/year			Under 500,000kWh
Distribution, warehousing and kit production	Under 50 people		Under 5,000 vehicle-days/ year		Under 500,000kWh
Hardware sales, software service development, creation, mail-order sales, insurance, finance, head office functions of all companies	Under 100 people			Under 100 tons/ year	Under 1 millionkWh
Not defined due to occupancy by two or more divisions with different activities, others	Under 100 people				Under 1 millionkWh

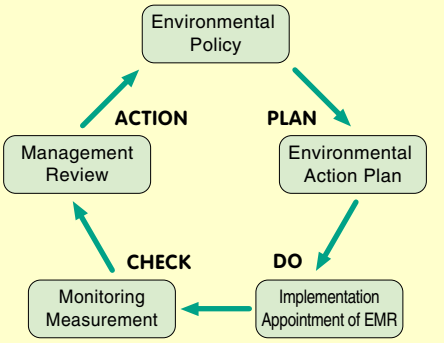
Note: Non-manufacturing sites exceeding the standards must attain ISO-14001 certification.

● Simple EMS

At Sony's non-manufacturing bases, offices below a certain size have voluntarily attained ISO-14001 certification. And even offices that have not been certified have drawn up action plans and are preparing simple environmental management systems.

This unique Sony approach is creating an even more powerful and comprehensive environmental management system for the entire Sony Group. This system is also linked to Sony's risk management programs. Sony is advocating that vendors and other business partners adopt a simple EMS and is extending the support needed to do so.

Simple Environmental Management System



The above chart represents the minimum level of environmental management that needs to be enacted at business locations that have not acquired ISO-14001 certification. Only the most important of the 18 items covered by ISO-14001 are included. This cuts down on the steps needed to establish the system while still preserving the Plan-Do-Check-Action (PDCA) functions that are at the heart of environmental management.

1. Top management shall define the environmental policy.
2. Top management shall establish the environmental action plan which consists of environmental objectives and targets, environmental program.
3. Top management shall apoint a EMR (environmental management representative), who is given the authority and responsibility for implementing and monitoring the progress.
4. EMR shall have the authority and responsibility for implementing and monitoring the progress and shall report the result to top management.
5. Top management shall review the whole simple EMS at least once a year.

Products

RESEARCH AND DEVELOPMENT

Research & Development

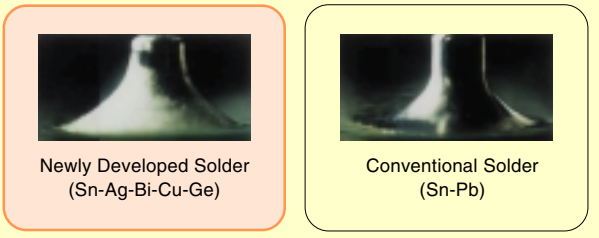
Sony is engaged in far-reaching research and development aimed at reducing the environmental impact of its products. Spearheading these activities are the Center for Environmental Technologies (CET), located within the head office Frontier Science Laboratories and the Production Technology Center. In addition, with a view to bolstering global R&D activities, Sony established an environmental R&D laboratory at the Environmental Center Europe (ECE) in the summer of 1998.

The following are some of Sony's recent accomplishments.

Sony Creates Lead-Free Solder

There has been considerable interest in the development of a lead-free soldering compound to lessen the environmental impact of this common manufacturing process. Sony responded with a unique material that contains no lead yet exhibits better reliability as well as compatibility with conventional equipment. By adding a small amount of germanium, Sony achieved dramatic improvements in workability and reliability. Work is now proceeding toward the practical use of this material.

Formation Evaluation



Newly Developed Solder (Sn-Ag-Bi-Cu-Ge)

Conventional Solder (Sn-Pb)

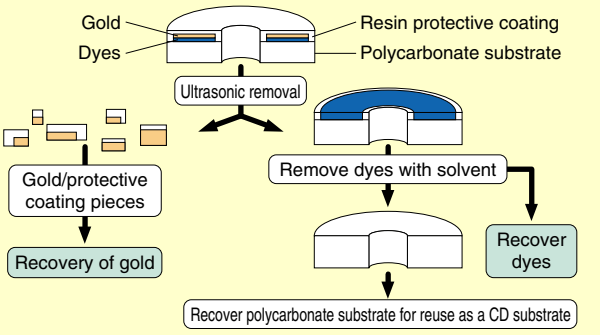
This new solder yields a form that is much closer to the ideal cone shape (see pictures above). Furthermore, the volume of solder guarding the joint has been doubled.

Other Achievements

Sony has also been researching ways to chemically improve polystyrene and ABS resin, which are used in large quantities in home electronics, to enable their reuse. Specifically, waste polystyrene materials such as those used in VHS cassette shells, TV cabinets and styrene foam are transformed into a water-soluble polymer that is used as a polymer flocculant in water-treatment applications. Meanwhile, ABS resin used in 8mm-cassette cases has successfully been transformed into a water absorbing resin. This resin can be found as a urine absorbing material in diapers. Sony is currently examining other commercial applications for these technologies.

Moreover, Sony is taking on the challenge of recycling CD-R optical disks as global sales expand rapidly. Since CD-R disks can be recorded only once, most are discarded after use. Sony's technology efficiently removes the reflective gold coating and enables recovery of the recording dyes. Additionally, this technology permits the reuse of recovered polycarbonate substrates as CD substrates (see diagram).

CD-R Recycling Using Ultrasonic Separation



In Europe, Sony has been studying the impact its products have on the environment. These efforts have produced a fount of knowledge and data.

These topics illustrate how Sony's environmental research and development programs in Japan and Europe are focusing on areas where each is strongest while promoting the exchange of information. Sony will continue to pursue these activities to further lower the environmental impact of its products and the materials used to fabricate those products.

Measuring product gas emissions at Environmental Center Europe

PRODUCT PLANNING

Each Sony product goes through a number of stages before it is ready for sale. At the very beginning of this lengthy process is product planning. Sony places priority on stressing environmental compatibility when a product advances from the planning to design stage. Sony promotes this policy through its Greenplus Project.

Environmental themes are incorporated at the design stage in the form of concrete targets to permit the assessment of new products. The result is a design that takes into account environmental considerations involving the procurement of materials, manufacturing and disassembly, environmental impact during the product's use, recycling and many other items.

● Sony's Environmentally Conscious Products

Sony believes that its products should reflect in the environment from the product planning stage onward. Based on this thinking, Sony launched the company-wide Greenplus Project in May 1994. The project is overseen by a Sony director and administered by the Corporate Environmental Affairs Headquarters. Furthermore, all Sony Group companies have appointed Greenplus representatives and are carrying out wide-ranging activities. These activities encompass all companies that make consumer products, products for broadcasting as well as components and semiconductors used to make finished products.

The product planning manager incorporates environmental considerations into the Product Planning Summary to clarify planning guidelines. This summary next goes to the chief designer who determines goals in the Design Concept Summary and confirms that these goals have been achieved when a product is commercialized. And, all products are reconciled in advance with the Greenplus standards. Every Sony Group company now has uniform goals; products that meet these goals are certified as "Greenplus products."

Five Group-wide Greenplus guidelines have been established.

1. Reduction of materials with an environmental impact
2. Energy-efficient designs
3. Resource-conserving designs
4. Environmental packaging
5. Environmental accessories

In addition, the company is working to improve recyclability and reduce the environmental impact during the production process.

● Greenplus 2000 Project

Sony implemented the Greenplus 2000 Project to prompt people connected with making products to think about the environment while they work. By doing so, Sony believes that the level of environmental consciousness across the company will be increased. Sony has drawn up and distributed a "Greenplus 2000 Handbook" to ensure that these guidelines are used by product planners and designers. These guidelines have also been posted on the company's internal network for all employees worldwide to read. Sony's overriding goal is to make every product environmentally sensitive by the year 2000.

PROCUREMENT

● Strategy for Harmful Chemical Substances in Purchased Components and Materials

Resource conservation. Recycling. Energy conservation. Reduction of harmful chemical substances. These are some of the diverse considerations that products must reflect. To this end, Sony is factoring in the environment at the earliest possible stages—product planning and design. Evaluations of environmental impact are based on quantitative analysis. Here, the most vexing issue is formulating a strategy for harmful chemical substances. Several factors underscore the difficulties involved.

- The components and materials that make up Sony's products are not all produced within the Sony Group. Consequently, Sony must obtain the cooperation of each supplier to control the use of certain chemicals.

- The need to oversee a large number of chemicals makes strict management of all substances extremely difficult.
- Products are comprised of many materials and components. Depending on the type of product, the nature of the components used is different. As a result, the chemicals that impact the environment differ from product to product. Thus, limiting the use of a particular substance will not necessarily lead to a reduction in the environmental impact of all Sony products.

Sony has designated 56 chemicals as Sony Specified Environmental Substances Used in Components and Materials. In 1999, Sony started the process of supervising the amounts of these chemicals that are contained in the parts and materials used to make each Sony product.

When selecting the 56 chemicals, Sony consulted relevant laws and the self-imposed regulations of industrial associations. Substances that had the potential to be used in electronics and electrical equipment were collated by group. From these groups, Sony deemed that 56 substances required management. And thanks to the cooperation of suppliers, Sony has assembled a database on the quantity of these substances found in the components and materials that it purchases. Sony is currently developing a system to calculate the total amount of specified substances in its products by using this database and information about the composition of each product. Results and evaluations obtained from this system will play an integral part in Sony's efforts to reduce chemical substances.

Sony's products pass through various companies and people from the time they are shipped to the time they reach store shelves. Simply prohibiting one company from using certain chemicals will not provide a drastic fix to the world's environmental problems. All companies must recognize that the environment should be an integral element of each product's specifications. Based on this understanding, these companies need to work together to improve product specifications from an environmental perspective and maintain a superior position with regard to environmental activities.

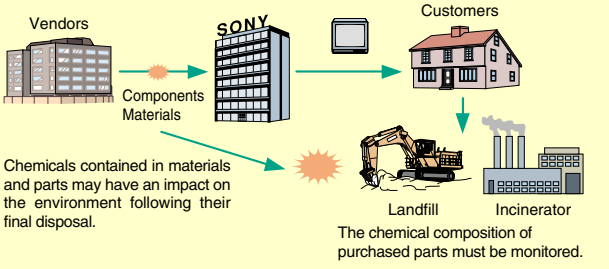
Sony is not explicitly prohibited by regulations from using the 56 substances on its list. The process of adopting substitutes and other ways to reduce use of these substances is instead proceeding by gaining the cooperation and understanding of business partners. Sony is convinced that this is the best way to achieve reductions in its environmental impact.

Sony kicked off its procurement management activities in fiscal 1997 with the goal of starting full-scale management in fiscal 2000. The company's efforts will progress in three stages.

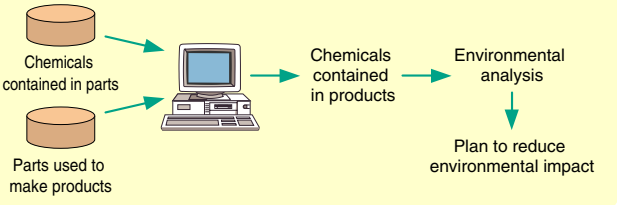
- Fiscal 1998: Establishment of a base for the framework of the entire management system
- Fiscal 1999: Data survey—Sony will survey suppliers to gather information on the quantity of specified substances contained in components that it purchases.
- Fiscal 2000 onwards: Evaluation of the environmental impact of products and execution of actions to reduce their environmental impact—Sony will systematically reduce the environmental impact of specified substances based on measurements of their content in each Sony product.

Through these activities, Sony is working to supply customers with products that incorporate environmental considerations.

Environmental Impact of Parts and Materials



Using Information About Parts and Products



DESIGN

Full Product Assessment in All Operations

Sony believes that the environment is an integral element of product quality. To this end, the company has mandated that all products in categories throughout the Sony Group undergo comprehensive product assessments.

Initially, product assessment (PA) focused on what happened to a product after its disposal. These considerations were then incorporated into design. Steps included:

- cutting down on the weight and bulk of products and materials to avoid exhausting resources
- verifying that products are easy to take apart to facilitate the reuse of materials
- taking measures against combustion or explosion to ensure safety during recycling

Today, PA is expanding into a means of ascertaining a product's overall impact on the environment, and of verifying the design steps capable of diminishing this impact.

Related departments in the Sony Group have been studying PA methods since 1991, well before implementation of the Environmental Action Plan. Efforts have gone into studying and improving the selection of environmental design criteria and checking methods, and into finding the best way of applying these criteria.

The company has PA specialists not only in design sections but also in materials and other design-related groups. They set out environmental objectives, study new technologies, and exchange information at meetings. Thus far, more than 50 of these meetings have been held.

PA specialists in each design section are working to develop product assessment standards tailored to their particular section's activities. Meanwhile, a top priority has been the creation of company-wide PA guidelines, covering:

- the establishment of design standards to minimize the environmental impact of each product
- verification that the prototype meets these standards
- further verification that these standards are met in full-scale production
- methods of handling the results of verification
- clarification of responsibilities throughout the assessment process

Based on these guidelines, Sony manages a variety of environmental items with regard to its products including such subjects as energy conservation, resource conservation, recycling, pollutants and packaging materials.

Reducing Product Energy Requirements

The lion's share of the total sum of energy consumed by an electronics product is consumed during use by the customer. Any effort to decrease its overall environmental impact must take this into consideration in the design stages. Furthermore, cutting energy consumption calls for lowering power requirements during a product's use as well as when a product is in the standby mode, a state needed to facilitate remote control functions, retain memory settings and support other functions. As a matter of course, Sony conforms to Japan's Energy Conservation Law and has also set category-specific goals of reducing by 60% the energy requirements for all products by 2002, compared with 1990 levels. Development of conservation technology to reach these goals is under way.

The energy-efficient KV-29DR5 has standby power consumption of 0.4 watts and an energy-saving mode that can be selected using the remote control.

Recycling a Larger Percentage of Products

Looking ahead, it is clear that society must strike a fruitful balance between environmental protection and profitable manufacturing. The implementation of proper technology, collection functions and other support systems are needed if recycling is to become a viable business field. Products themselves must facilitate easier recycling. Sony is putting priority on more effective end-of-life treatment for its products by incorporating product assessments and recycling considerations as factors in design. To allow a larger percentage of materials to be recovered from its products, the company is working to:

- use recyclable materials and uniform materials
- create structures that are easier to recycle, giving thought to bonding methods, dismantling and disassembly
- incorporate information labels for recycling, i.e. identifying type of plastic or the material used in circuit boards

Reducing High-Environmental-Impact Materials

Sony has made major strides in eliminating high environmental impact materials from its products. The company recently developed an external housing and FR-1 printed circuit board made of halogen-free flame-retardant plastics. These plastics take advantage of technology to prevent the formation of toxic dioxin and furan compounds. In Europe, the housing and circuit board were first introduced in a color TV set in 1995, followed by a computer display in 1996. In 1998, they were introduced into home VCRs and audio equipment in the same region. Products incorporating this technology were on display at CeBit HOME exhibition in Hannover, Germany in August 1998.

1998 also saw the development of the halogen-free CEM-3 circuit board and FR-4 multilayer circuit board for high-performance products like DVD players. Sony started selling these products in April 1999.

Sony's halogen-free external housing and printed circuit boards clear Phase II limit of the German Dioxin Ordinance, which will be implemented on July 16, 1999. They also meet the EU's WEEE regulation for the complete abolition of halogenated flame retardants, the regulation that is not scheduled to take effect until January 1, 2004. Moreover, these items comply with German Blue Angel and Swedish TCO 95 standards. Sony plans to progressively introduce products incorporating these halogen-free external housings, circuit boards and similar components to other markets around the world.

A newly developed halogen-free FR-4 multilayer PWB

Environmentally Conscious Packaging

The effective use of resources for product packaging materials is a major theme at Sony. And to reduce industrial waste, Sony departments responsible for product planning and distribution are cooperating to develop improved packaging materials. In this drive, they are focusing on the four R's: Reduction of packaging materials; Replacement of packaging materials with environmentally friendly substances and materials for which a recycling infrastructure exists; Reuse of packaging materials; and Recycling of packaging materials.

Since 1991 Sony has been packaging Walkman models, 8mm camcorders and many other products in molds made of used paper rather than styrene foam. By doing so, Sony is promoting the use of recycled materials. In 1996, Sony teamed up with Japan's Rengo Co., Ltd. to fabricate a new packaging material called Cellu Mold that consists of used paper. This revolutionary material boasts shock-absorption properties equivalent to that of styrene foam. Moreover, with the assistance of product design engineers, Sony succeeded in creating a packaging material for Walkman models, portable telephones and other products that eliminates the need for cushioning substances such as styrene foam. Recently, with partner Chuoh Pack Industry Co., Ltd., Sony has developed a one-piece box which, as the name suggests, is made from a single sheet of cardboard. Absolutely no styrene foam is used. This packaging innovation has already been applied to VHS VCRs sold in Japan and Europe. Better still, both Cellu Mold and the one-piece box can be used again in the form of recycled paper.

Sony's packaging advances have received high marks both in Japan and overseas. Cellu Mold was awarded the Japan Star Prize and the World Star Prize in 1996. In 1998, the one-piece box captured the Japan Star Prize, Asia Star Prize and the World Star Prize. By building on these accomplishments, Sony plans to aggressively develop and introduce more environmentally conscious packaging.

One-piece box

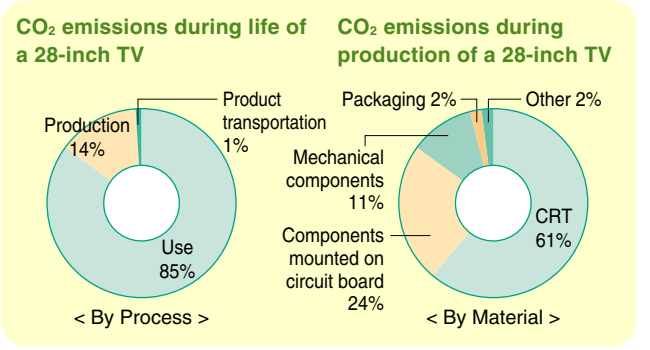
Cellu Mold

Halogen-Free Flame-Retardant Plastics ☞ page 47

DESIGN SUPPORT

Assessing the Environmental Load of Sony Products

Sony's products spend most of their life cycle in the hands of customers. However, products can have an environmental load well before they are manufactured. This is why Sony estimates the extent of that load for the entire product life cycle—from raw material extraction to recycling of products that can no longer be used. Sony will employ the results of this analysis to reduce the environmental load of its products even more. Sony is conducting research in many fields with this theme in mind. The pie chart on the left shows at what stages of a TV's life cycle CO_2, a greenhouse gas, is emitted. Figures are based on the use of a 28-inch widescreen TV for 10 years.



Sony calculated the CO_2 emissions from the fossil fuels, electricity and other energy sources required at various stages in this television's life cycle-from production and transportation to use and disposal. From this analysis, Sony learned that by far the largest emissions are linked to the electricity consumed while in use. Obviously, reducing energy consumption can have a major effect on lowering a TV's environmental load in the form of CO_2 emissions.

Furthermore, Sony discovered that the CRT is responsible for the largest share of CO_2 emissions during TV production (see pie chart above). Consequently, reduction of the weight of CRTs has a direct effect on lowering the environmental load.

In this manner, Sony is analyzing the environmental load of products throughout their respective life cycles to isolate areas that require improvement.

Design for Assembly-Disassembly Cost-Effectiveness: DAC

To promote recycling, Sony developed Design for Assembly-disassembly Cost-effectiveness (DAC). Based on information obtained from the very first stages of product design, DAC quantitatively gauges two product attributes: ease of dismantling and ease of assembly. The results of these evaluations are quickly incorporated to improve product designs in terms of structure, components used, connections, production processes and other points.

Sony uses DAC to evaluate the design of all products, including TVs, PCs, audio equipment and VCRs. Furthermore, the company has formulated a training curriculum for DAC and holds regular meetings to announce DAC improvements.

Looking ahead, Sony plans to adapt to changes in demands placed on product designs by developing a system that capitalizes on 3-dimensional CAD and a network system that uses DAC evaluations and design information. At the same time, work is proceeding in the development of DAC-LCA to allow calculating CO_2 emissions over a product's life cycle.

Support of Product Assessment

In September 1998, the Environmental Center Europe (ECE) officiallly started providing environmental assessment services for products of the worldwide Sony Group. ECE evaluates products and produces reports based on international standards so that improvements can be incorporated at the design stage. Assessments address a broad spectrum of issues. Among them are packaging materials and labels; checking documentation packaged with products; measurement of power consumption; acoustic noise measurement; electromagnetic field measurement; evaluation of ease of product dismantling; and the materials used.

PRODUCTS

Greenplus Products

1. Energy conservation
   - SLV-E830/E730/E530/E430 home video deck

     These home video decks, which are sold in Europe, incorporate a power saving mode. By selecting this mode through the on-screen display, users can cut standby mode power consumption by more than half. In the SLV-E730, for example, standby power consumption falls from 7.4W to 2.8W.

   - DHC-MD777 mini audio system

     The DHC-MD777 mini audio system has a power supply equipped with a supplementary transformer, relay, regulator and microprocessor. When the system is in the standby mode, this additional circuitry ensures that power is sent only where it is needed, such as the fluorescent display and timer. During this time, a relay cuts off power to the main power supply transformer to prevent the waste of electricity. The benefit is substantial. Standby power consumption has fallen from about 16W to less than 3W and, when the clock display is switched off, only 1W.

   - ICF-B200 Hand-wound radio

     An exclusive Sony compact spring-powered generator powers this compact radio. One minute of winding charges the internal battery enough for about 30 minutes of listening. With a full charge, equivalent to about 30 minutes of winding, the radio will operate for roughly 20 hours.

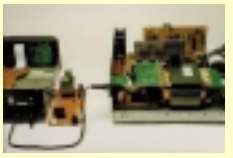
   - Solar remote control
   - "Stamina" Handycam
2. Resource conservation
   - 1.43 LCD panel LCX011AM for projectors
   - HF audio cassette
3. Recycling
   - VAIO PCG-505 series

     The primary feature of the PCG-505 series is the first use of a magnesium alloy in a notebook computer for four surfaces of the outer case: interior and exterior of the LCD section and interior and bottom of the main unit. The use of this alloy made it possible to reduce the size and weight of these computers.

   - Tectan speakers (see page 33)
4. Materials with environmental impact
   - All audio cassettes

     Sony has eliminated the use of chromium oxide as a surface polishing material for its audiotapes. The Metal ES and CDix IV were the last two models to use this compound during their manufacture. Although chromium oxide itself is not poisonous, it can be transormed into a highly toxic substance under certain circumstances. Sony therefore set itself the goal of developing new tapes whose manufacture requires no chrome.

Power-saving switch (SLV-E830)



Standby power supply circuit board with standby transformer

30 minutes of FM reception is possible with only 1 minute of power generation. (ICF-B200)

A Digital Handycam with extended playback time

The HF series uses plastic cases that are 10% lighter.

The VAIO PCG-505 series uses a magnesium alloy on four sides.

Chrome-free metal tape

● Energy Star/Energy Conservation Products

In the United States, Sony Electronics' TV set, VCR and computer monitor operations in 1993 became a founding member of the Energy Star program of the federal Environmental Protection Agency. Energy Star was instituted to extend certification to products that meet certain standards for energy conservation. In 1998, Sony Electronics was selected as an Energy Star partner in the home appliance sector. The EPA chose Sony Electronics because of its noteworthy contributions to the program over the years, including the certification of a large number of products. Of particular significance was Sony's ability to cut standby power consumption to less than 1W, and 0.6W in some models, both far below the EPA's 3W standard. Sony Electronics plans to retain an aggressive posture with regard to Energy Star certification, especially for audio and DVD products.

The March 1999 Energy Star award ceremony

● Alkaline Batteries Acquire Green Label in Thailand

In July 1998, Sony Magnetic Products (Thailand) obtained the Green Label from the Thailand Environmental Institute (TEI) for its alkaline batteries. Acquisition of this label is a first in that country's battery industry. Several factors are credited for the attainment of this achievement.

1. The product shall not be formulated or manufactured with added mercury.
2. The producers shall have a "take-back" policy for used batteries or have a plan to "take-back" used batteries within six months after receiving Green Label status.
3. The producer shall minimize in-process waste so that off-grades do not exceed 0.5% of total product output.

Sony Magnetic Products' lineup of alkaline batteries

Used battery collection box

Green Label

● Tectan Loudspeakers

The SS-BG30, which is being sold in Europe, uses loudspeaker boxes made from Tectan, a material produced from recycled Tetrapak cartons. Tectan consists of 75% paper, 20% polyethylene foil and 5% aluminum. The front of the box, a medium pressure fiber plate, is attached to the Tectan panels with screws for easy dismantling.

Tectan has received much recognition. The September 1997 issue of Switzerland's Sound & Vision magazine proclaimed that Sony's eco-speakers are not just for show; they also boast sound quality that is worth listening to. Likewise, the April 1998 issue of Germany's Audio magazine said that Sony's speakers show that the dual goals of environmental consciousness and high-quality sound are not unattainable. These loudspeakers use packaging made entirely from used cartons and come with an environmental information sheet that follows ECMA TR70 standards.

The SS-BG30 Tectan speaker enclosure

Services & Recycling

SALES ACTIVITIES AND LOGISTICS

Environmental protection activities have so far focused predominantly on manufacturing bases. But the scope of these activities is widening as non-manufacturing bases get in on the act. The following are just a few illustrations of initiatives taken to date.

Sales Promotion Activities Have the Environment in Mind

As part of Green Management 2002, Sony has stipulated two conditions for sales and promotion activities.

- Tools created for sales promotions should, where possible, use materials that do not have an environmental impact.
- Sony Group companies must work to reuse materials used for booths and displays at exhibitions and other events to reduce the volume of waste.

EXPO '98 — The Lisbon World Exposition

Sony was an official brand sponsor of Portugal's EXPO '98, which had as its theme "the oceans, a heritage for the future." Sony set up an environmental booth at the exposition, which was held from May to September 1998. In concert with this event, Sony Portugal took the following actions:

- Leaflets were made smaller and printed on recycled paper.
- Steel and wood were used for the booth to minimize the environmental impact of materials used as much as possible.
- Some of the booth materials were reused at other exhibitions afterward.

Sony at EXPO'98 in Lisbon, Portugal

Environmentally Sound Distribution

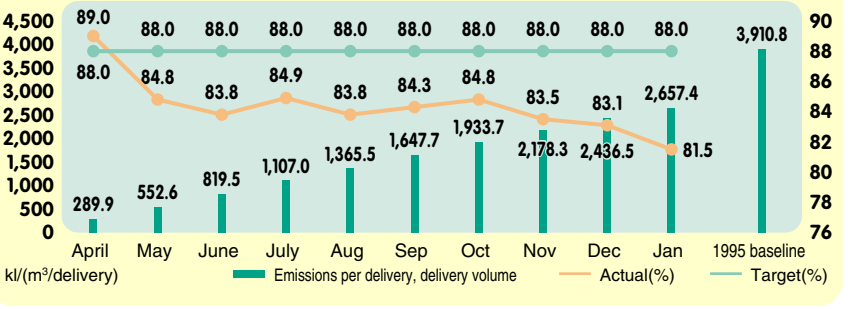
In Japan, Sony Logistics operates at 52 locations that are covered by ISO-14001 certification activities. A program to earn this certification was conducted by dividing these locations into six geographical groups, representing the company's six regional offices. This drive led to Sony Logistics becoming in February 1998 the first logistics company in Japan to obtain ISO-14001 certification. Sony Logistics now aims to acquire certification for all six groups by the end of November 1999.

Sony Logistics is currently focusing on five themes: reduction of air pollution; energy conservation; reduction of waste; reduction of paper consumption; promotion of greenery. As a distribution company, Sony Logistics naturally places air polllution first. Burning less diesel fuel in its trucks leads directly to a drop in the release harmful gases. Exemplifying this drive is the western Japan regional office's use of the ratio of average shipment size per delivery to fuel consumed as a yardstick for progress. Using 1995 as the baseline, this office plans to maximize the volume of each delivery, thereby raising the efficiency of its operations.

Most deliveries are performed under contract by other trucking firms since Sony Logistics operates very few trucks of its own. The company is thus seeking the cooperation of these business partners and assisting in their own efforts to fulfill environmental goals.

The graph below illustrates progress in reducing fuel consumption. Note that the cumulative 18.5% reduction as of January 1999 far exceeds the 12% target.

1998 Cumulative Gas Emissions at Sony Logistics—Western Japan



RECYCLING INITIATIVES

● Recycling of TVs

From the planning, design and production stages, Sony is conscious of the importance of making products that can be easily recycled. To this end, Sony is devoting itself to the advancement of recycling process technology. The company has already made significant progress on the recycling of color televisions.

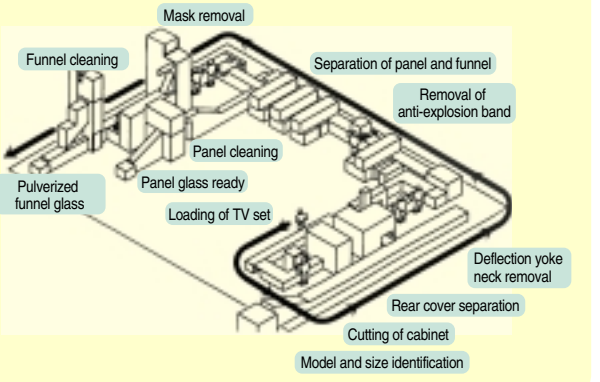
The Display Company, which includes Sony's television business, began studying more efficient ways of dismantling and recycling used televisions in 1991. The laboratory started out by developing recycling technology for CRTs, which account for over half of the materials inside a TV set. In September 1992, those efforts paid dividends with the development of disassembly technology for the two types of glass used for the CRT's rear funnel and front panel. Furthermore, technology to dismantle TV sets and take out CRTs was developed in a joint project with the Production Technology Center.

In 1994, these TV disassembly and CRT recycling technologies won recognition from the Association for Electric Home Appliances. The association commissioned Sony to develop and build a prototype recycling line for used televisions. The first of its type in the world, this prototype line automated much of the recycling process. First, the TV cabinet is opened and the CRT removed. Next, the CRT's front panel and rear funnel are separated. Finally, the glass is pulverized for later use. This prototype line was operated by the Association for Electric Home Appliances at the Kazo Plant of Nakataya Co., Ltd., located in Saitama Prefecture, through March 1997.

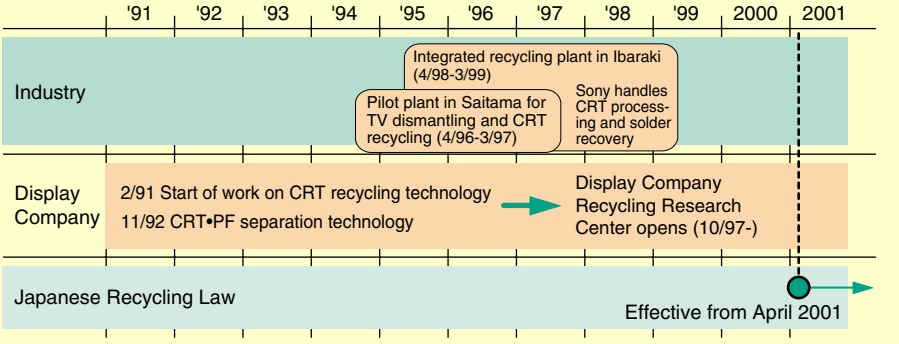
Furthermore, the Association for Electric Home Appliances, acting as a supplementary agency of the Ministry of International Trade and Industry, started development of an integrated facility in 1995 to support the recycling of the four main home appliances: TVs, refrigerators, washing machines and air conditioners. The plant was completed in March 1999 in Nakamachi, Ibaraki Prefecture. By drawing on knowledge gained at the Saitama facility, Sony was able to supply this new plant with an even more sophisticated CRT recycling system.

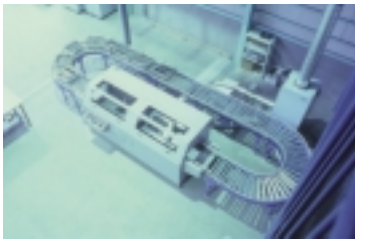
This prototype plant is making recycling technology for home electronics available to the public and carrying out research to increase the use of recycling systems. As a model for future facilities, the plant incorporates many advances to improve working conditions and minimize the impact on its neighbors. The plant has an annual processing capacity of roughly 150,000 appliances, assuming 6-hour daily shifts

The Saitama Prototype Recycling Plant



TV Recycling at Sony





Solder removal unit
© Association for Electric Home Appliances

Panel/Funnel ☞ page 47

for 240 days. In a single year, the plant can handle 51,000 TVs alone. Furthermore, not only can the plant recycle CRT glass, but it has carried out research on the removal of solder from circuit boards that Sony developed.

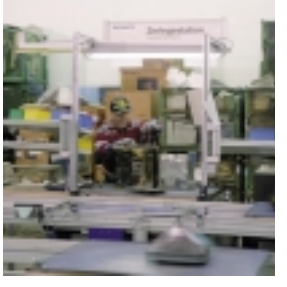
To respond to various issues, including feedback about TV designs, improving the recycling rate, and making TVs more economically efficient, Sony Display Company set up the DC Recycle Research Center in Ichinomiya, Aichi Prefecture in October 1997. This new center keys of the successes to date and is studying ways to achieve more progress in the field of recycling.

● Computer Display Take-Back Initiative

Since March 1996, recycling labels have been delivered with all Sony computer monitors that are put on the market in Germany. The label can also be purchased separately. Any display bearing this label can be returned to one of 800 collection points nationwide, from which it is collected and recycled by a partner firm.

● Dismantling Line for Germany

Sony teamed up with Neue Arbeit ("New Work"), an organization devoted to activities for the benefit of society, to build a disassembly line inside Neue Arbeit's facility in Stuttgart, Germany. The line was officially handed over to Neue Arbeit in April 1998. The Elektro-/Elektronikrecycling, a company that operates under the umbrella of Neue Arbeit, was offered the line by Sony at no cost for its recycling activities. Elektro-/Elektronikrecycling accepts products of companies in and around Stuttgart. In return, Sony gained valuable insights into the work of a certified recycler and the problems related to recycling consumer electronics. Knowledge gained here will help form the basis for new product design strategies.



● Take-Back Initiative in the Netherlands

On January 1, 1999, a law came into force in the Netherlands mandating the recovery of all large home appliances. With this legislation, the Netherlands became the first EU member state to legally request an industry-wide product recovery program. In response, FIAR, a federation of home electronics manufacturers, importers and retailers, and VLEHAN (Netherlands Association for Electric Home Appliances) established foundations for the recovery of home appliances. Sony is one of the companies responsible for administration of FIAR's foundation. The foundations handle finances and order recycling services from the Netherlands Union of Metalelectro-Products, which has general responsibility for the take-back organization.

Sales and marketing managers at Sony have explained to over 2,500 retailers their responsibilities in respect of the recovery system and solicited their cooperation. Other FIAR member companies are promoting the system in the same manner. FIAR is now considering the installation of a hotline to respond to the large volume of questions from retailers and consumers.

● Rechargeable Battery Collection and Recycling

To comply with the laws concerning rechargeable batteries in Europe, the U.S. and Japan, and to use rare-earth metals responsibly, Sony has promoted the establishment of a collection system and development of recycling technology. In particular, Sony teamed up with Sumitomo Metal Mining to reuse cobalt, a rare-earth metal. Sony thus became the world's first manufacturer to develop recycling technology for lithium ion batteries.

In this manner, Sony has continuously worked on establishing the necessary infrastructure for recycling rechargeable batteries. While the company's task is by no means complete, Sony is tackling remaining issues head on. A prerequisite for successful recycling is the cooperation of consumers. However, recycling of rechargeable batteries has regrettably not caught on among consumers. There are several reasons.

1. Consumers often hold on to a rechargeable battery after the end of its life span.
2. Rechargeable batteries can be used for at least 2 years and are thus not regarded as trash by the consumer.

3. Sales outlets and other retailers are used as collection points. But the number of these collection points is limited.
4. A lack of advertising and other ways to inform the public about collection and recycling.

Looking ahead, recycling must expand in spite of these difficulties.

Taking up this challenge, Sony is experimenting with new ways to increase the recycling of rechargeable batteries. In the U.S., Sony has been conducting its own program to collect used nickel-cadmium rechargeable batteries. To heighten the collection rate, Sony became a member of a recycling firm. Sony is also taking on the challenge of recycling lithium ion batteries. To this end, the company has started an experiment at its Dothan Plant in Alabama. Furthermore, in Germany, Sony helped establish a non-profit organization to collect used batteries as mandated by law. With the cooperation of other founding members, Sony is promoting collection and recycling through this new organization. Moreover, in Japan, in line with the policy of the Battery Industry Association, Sony is working to promote the collection and recycling of batteries. Technology already exists to collect precious metals such as cadmium, nickel and cobalt from rechargeable batteries. But the recycling rate must be boosted if this technology is to be used effectively. This is an issue common to all countries and one that cannot be solved by regulations alone. In a sense, therefore, battery recycling is about to advance to a new era that focuses more on encouraging users to cooperate voluntarily.

Collection of Ni-Cd Batteries by Sony

Fiscal Year	Volume Collected (Kg)
97	1095
96	1659
95	2000
94	933
93	656
92	411

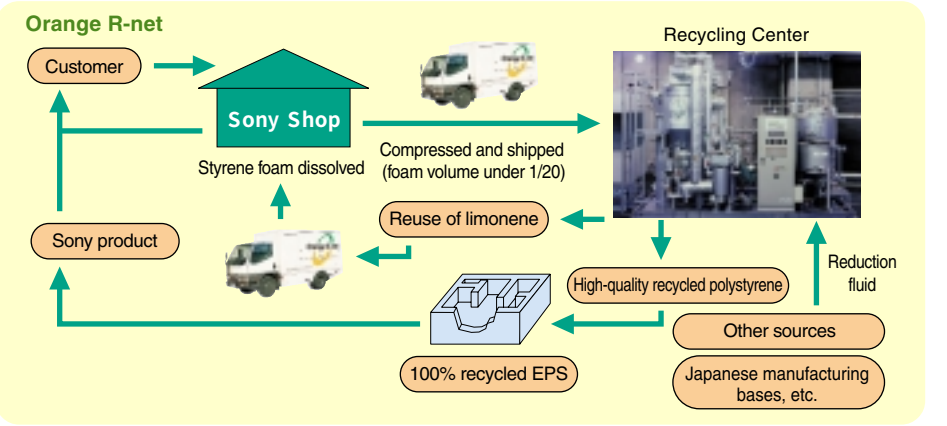
● Recycling in Asia

Since December 1993, recycling laws in South Korea have mandated that manufacturers and importers of certain products pay a deposit to ensure compliance with collection and disposal regulations. As an importer of TV sets and batteries, Sony International Korea pays a levy in accordance with the quantity of these products brought into the country. In the case of used batteries, Sony International Korea pays levies to the government and collects the used batteries. Upon collecting and sending the used batteries to the government-certified recyclers, part of these deposits is then returned upon submission of proof that the corresponding products were properly retrieved and treated. The Ministry for the Environment and Industry uses the remaining revenues to conduct the waste disposal and recycling program.

● Styrene Foam Recycling System: Orange R-net

Sony's Center for Environmental Technologies developed an ecologically sound method for recycling styrene foam. By using liquid limonene, a natural isomeric terpene extracted from the skins of tangerines or other citrus fruits, researchers discovered that they could recycle waste styrene foam as high-quality polystyrene. In December 1998, a large-scale research laboratory, the Limonene Recycling Research Center, started recycling operations in Ichinomiya, Aichi Prefecture.

The Limonene Recycling Research Center at Ichinomiya, Japan

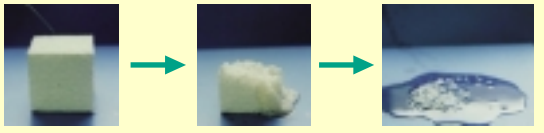


Sony began collecting styrene foam from Sony retailers in the Tokyo metropolitan area in October 1996. And in December 1998, Sony started recycling waste styrene foam from domestic manufacturing bases using the Limonene method. As of April 1999, Sony had recycled a total of about 30 tons of styrene foam.

The styrene foam packaging materials used for TVs are made from 100% recycled materials. Use of this recycling system to produce styrene foam from recycled polystyrene reduces CO_2 emissions by two-thirds compared with making styrene foam from virgin styrene foam. The adoption of this system, called "Orange R-net," will therefore result in substantial reductions in CO_2 emissions.

Sony's activities was awarded the fiscal 1998 Nikkei Environmental Technology Prize for its limonene recycling system.

Dissolving Styrene Foam With Limonene



EPS 125cm³ | after 1 min. | after 3 min.

● CARE "VISION 2000"

Comprehensive Approach for the Recycling of Electronics

The CARE "VISION 2000" program was launched in 1993 as a research platform for pursuing joint solutions for the recycling of electronics equipment. Under the aegis of EUREKA, this official European Umbrella program (EU 1140) brings together more than 200 participants from the electronics, computer and recycling industries in Europe. These industries, together with industrial associations, research institutions and universities, cooperate on cutting-edge research to facilitate eco-design and the recycling of electronic products.

Sony initiated CARE "VISION 2000" in 1993. The company now assumes a central role as one of the steering board members. Day-to-day operations and management are the responsibility of the International CARE "VISION 2000" Secretariat in Vienna, Austria.

CARE "VISION 2000" organizes biennial events called CARE INNOVATION. The first event was held in Frankfurt in 1996 in cooperation with the German Federal Ministry for the Environment, EUREKA and EXPO 2000. The second event was held in Vienna in November 1998 and attracted more than 300 participants. The third event, and probably the largest thus far, is slated for Hanover during that city's World Exposition EXPO 2000.

For further information, please contact:
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Contact persons: Mr. Bernd Kopacek & Mr. Bernd Habiger
Web site: http://members.magnet.at/care_vision_2000

● Recycling in America

Sony has a Consumer Products Center (CPC) in Nuevo Laredo, Tamaulipas, Mexico, that reconditions Sony products that have been returned. The center's efforts have earned it the Superior Plant Award. Most of the 2.5 million items that the CPC recycles annually are refurbished to enable their reuse. The small number of remaining products are broken down into plastics, metals and other materials for recycling.

Sony's Consumer Products Center in Nuevo Laredo, Mexico

Environmental Systems

Education and disclosure are two of Sony's five primary environmental protection activities.

Based on the recognition that there are no easy solutions for the world's environmental problems, Sony believes that everyone around the world must work together to find solutions.

So that Sony's roughly 173,000 employees around the world can contribute to this drive, Sony has in place an education and support system.

The environment is a precious asset shared not only by mankind but by all life on Earth. And Sony is committed to making available to the public information on how its activities affect the environment.

Support

EDUCATION AND TRAINING

Environmental Training for Employees

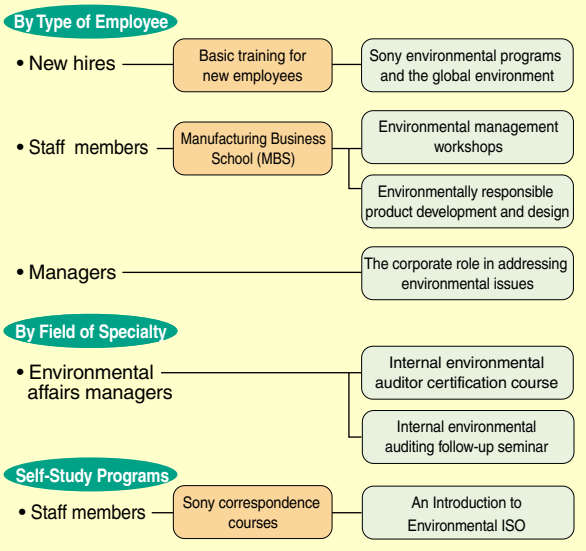
Disseminating Environmental Information

Environmental Conservation Committees in the Sony Group publish a variety of periodicals to disseminate the latest information to employees in Japan and overseas. Almost all periodicals are circulated electronically and the environmental protection activities of every region can be viewed on the Group's Intranet.

Environmental Education and Research

Sony believes it is important that every employee has an awareness and interest in environmental issues and that they participate in environmental protection activities. To this end, Sony effectively utilizes its environmental management system to prepare education programs addressing various objectives and needs. Furthermore, starting with the Sony Head Office, all offices worldwide are implementing proprietary training programs.

The Sony Head Office Environmental Training Systems



Environmental Proposals Campaign

From August through September 1998, Sony ran a Group-wide campaign as part of its environmental awareness program for employees. Unique ideas for environmental protection in the workplace and at home, environmental slogans and ideas for activities that embody Sony's approach to the environment were solicited from employees. In all, more than 1,750 suggestions were received. Individuals who submitted superior ideas received an award from the chairman of the Environmental Conservation Committee and the ideas were posted on the Group's Intranet.

Support for Environmental Education of Students

The Sony Environmental Conservation Prize

In October 1998, Sony Group companies in Singapore established the Sony Environmental Conservation Prize to stress the importance of environmental issues among the young people of that country. Open to university and polytechnic students, the competition solicits innovative ideas for environmental conservation. Tertiary Institutions Council for the Environment (TICE) and Singapore's Ministry of the Environment are cooperating with administration of the award. The winner will receive a monetary award on World Environment Day in June.

Training for Students

Sony International Europe is supporting the Sustainable Business Challenge, which places tests on the Internet targeted at students. With the cooperation of AIESEC, an international student organization, Sony has also established an internship program. Students who pass the Internet test and display sufficient knowledge of the environment can apply for a half-year training program at Sony's Environmental Center Europe. Here, these students learn the fundamental principles for sustainable development and about Sony's environmental protection activities. The first students completed their training in February 1999.

ENVIRONMENTAL PROMOTIONS

Environmental R&D Fund

Sony's environmental R&D fund supports the development and promotion of revolutionary technologies by the Sony Group worldwide. Under the system, which was inaugurated in 1993, Sony Headquarters directly funds research in worthwhile projects. The Sony Environmental Fund Committee studies and selects themes. All environmental research activities of the Sony Group are eligible for funding. To obtain funding, a research theme must play a role in meeting Green Management 2002 targets, embody creative and innovative thinking and target an issue that can benefit the entire Sony Group.

In 1999, the fund will support roughly 20 projects. Some of the technology projects supported thus far are profiled on page 42.

Overall, research and development supported by this fund is playing a big role in the Sony Group's efforts to reduce the environmental impact of its activities.

Award System

Open to the Sony Group worldwide, the award system comprises two types of recognition. The first is the Sony Environmental Award, which honors achievements in environmental protection. The second is the Regional Environmental Award. This award recognizes achievements within a particular geographic area, including the Americas, Europe and Asia.

Sony Environmental Award

Initiated in 1994, Sony Environmental Awards are presented once a year by the president of Sony. Recognition is given to accomplishments in the previous fiscal year in the fields of technology, products and management related to the environment. The fifth annual competition in 1998 drew 126 applications, 85 from Japan and 41 from overseas. After careful deliberation, 21 projects were selected. Awards were presented on July 2 at Sony's head office to commemorate World Environment Day.

The table on the next page summarizes the primary themes that have captured the Grand Prize in earlier years.

Sony America Environmental Award

Established in 1996, this award aims to promote environmental protection activities in America. The award is open to plants, product development teams, and organizations concerned with the safety of the environment and employees. There are several awards: Safety and Hygiene Audit Award, Sony Corporate Award, and Special Project Award. Recognition is given to activities that lead to higher safety standards and the environment. The 1998 award ceremony was held from October 14 through 16 by the Risk Management and Environmental Safety and Hygiene Committees in San Antonio, Texas. One of the recipients was Sony Disc Manufacturing, Pitman, New Jersey, which was recognized for its Environmental Safety and Hygiene Program.

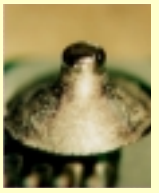
Sony Europe Environmental Award

The Sony Europe Environmental Award program was initiated in 1995.

Open to all Sony Group companies in Europe, the award is presented by the chairman of Sony Europe. The awards are similar to the Sony Environmental Awards in that they recognize environmental considerations and social responsibility. Uniquely European, however, is the Eco-Efficiency Prize, which is awarded to activities that add extra value to Sony products or make them more appealing to customers. At the 1998 award ceremony held on September 23, TV Europe-Fellbach and Sony Deutschland G.m.b.H. were awarded the Eco-Efficiency Prize. Their achievement was the development of a honeycomb-shaped carton cushion and its use in the KV-29C3 TV.

Sony Asia Environmental Award

Started in 1996, this award serves mainly as a means to recognize business locations in Asia that have earned ISO-14001 certification. At the Asian Global Environmental Conference held on May 19, Sony Singapore and 12 other Sony Group members received awards for 1998.

	Award Theme and Recipient	Theme Outline	Progress Report
1st Award 1994	No award given.		
2nd Award 1995	New styrene foam recycling technology and development of experimental equipment (Center for Environmental Technologies (CET) in the Sony Research Center/Limonene Recycling Promotion Office of Corporate Environmental Affairs.) Note: The CET in the Sony Research Center was renamed the Frontier Science Research Laboratory Environmental Technologies Center as of April 1, 1999.	Development of an ecologically sound recycling method for styrene foam. Foam is dissolved in liquid limonene, a natural isomeric terpene extracted from the skins of tangerines and other citrus fruits. 	Orange R-net as the styrene foam recycling system is called, consists of a recycling center and 2-ton trucks that can process roughly 300kg of styrene foam. In October 1996, Sony began trial collections of styrene foam from roughly 50 Sony shops in the Tokyo metropolitan area. Approximately 13 tons of styrene foam were recycled. Furthermore, having received the Ministry of International Trade and Industry's subsidy for the development of industrial production technology that streamlines the use of energy, the company established the Limonene Recycle Research Center in Ichinomiya, Aichi Prefecture in March 1998. That center has been carrying out further research and development for the large-scale recycling of styrene foam.
3rd Award 1996	TV and cathode ray tube (CRT) recycling technology (Production Technology Center, Products Recycling Subcommittee, TV Scrap Working Group) 	Sony, with the cooperation of recycling firms, developed an automated mass TV dismantling and CRT recycling system for the Association for Electric Home Appliances. Subsequently, Sony developed on consignment a CRT processing process at the world's first integrated facility to support the recycling of the four main home appliances: TVs, refrigerators, washing machines and air conditioners.	By the end of March 1997, actual experiments had been conducted on the association's prototype line inside Nakataya Co., Ltd.'s plant in Kazoshi, Saitama Prefecture. Based on the results of these experiments, a prototype line was set up at the association's integrated facility to support the recycling of home appliances in Nakamachi, Ibaraki Prefecture in April 1998. The results of those experiments will be reported in March 1999. As a result of those experiments, recycling technology for glass in CRTs has been developed. Experiments are still being conducted. Companies in the home appliance industry and government bodies are both studying the introduction of this technology. Leveraging this technology, Sony plans to establish a TV recycling plant in Ichinomiya in April 2000 to comply with the Home Appliance Recycling Law, which will come into effect in 2001.
4th Award 1997	Chemical recycling technology for waste polystyrene (Center for Environmental Technologies (CET) in the Sony Research Center, Atsugi Employee General Affairs Division) 	Polystyrene plastic is used in home appliances for VHS cassette shells, TV cabinets and styrene foam. Sony developed recycling technology that transforms this plastic into a water-soluble polymer using a process called 'sulfonation.' This polymer can be used to condense pollutants contained in wastewater from factories and separate it into cleaned water and sludge.	Sony has conducted field tests with a view to introducing this technology into plants in Japan. At the same time, Sony is promoting joint research with several companies in other industries with the aim of having this technology adopted outside the company. Furthermore, Sony is transforming ABS plastics into a super absorbent resin, using a chemical process. ABS plastics are found in 8mm cassette shells and many other Sony's products. Able to absorb several hundred times its weight in water, this resin can be found as a urine absorbing material in diapers.
5th Award 1998	Development of lead-free solder (Center for Environmental Technologies (CET) in the Sony Research Center; Production Research Center, Surface Mounting Technology Department) 	The special feature of the newly developed solder is that it is a combination of tin (Sn), silver (Ag), bismuth (Bi), copper (Cu), and germanium (Ge). The addition of a small amount of germanium and exacting control of the quantity of bismuth are two more features, yielding dramatic improvements in workability and reliability.	The newly developed solder boasts not only workability attributes such as acid resistance and wettability but also reliability from various angles, including thermal fatigue properties, high-heat grip, mechanical fatigue properties and shock resistance. In all respects of durability, the new solder is superior to existing lead-based solder. Furthermore, the temperature at which the solder can be worked, 250°C, is almost the same as that used when working with lead-based solder. Since existing equipment can be used, there is no need to make new investments. Currently, manufacturing bases are studying ways to employ the new solder.

SOCIAL RESPONSIBILITY

As a conscientious corporate citizen, and based on the premise that the company should grow and prosper in concert with society, Sony conducts a variety of community programs. Sony's involvement encompasses a broad range of activities in the arts, culture, education, social welfare and international exchanges. The following are just a few illustrations of Sony's participation in activities related to the ecology and the environment.

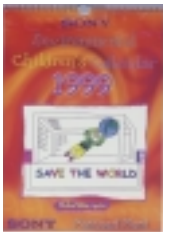
● Children's Environmental Calendar for Canada and the United States

During the past few years, Sony of Canada and Sony Electronics have produced an environmental calendar. For 1999, Sony Electronics asked children to submit drawings.

Entries are divided into three age groups: 7 years and under, 8 to 10 years, and 11 to 14 years. Judges then select 4 winners from each category. The winning entries are featured in the following year's calendar. Sony Electronics has distributed about 5,000 calendars in each of the past 4 years. They are sent to Sony employees, offices, stores and service centers, many eventually ending up in the hands of customers.

● Sony UK Project

In England, Sony Pencoed has donated some of its land to the local community for an orchard and tree nursery for cultivation by people with learning difficulties. The orchard and tree nursery will provide regular work and training for eight people, who will work toward a vocational training qualification (NVQ). In the orchard, 30 trees have been planted; the nursery is growing trees from seeds gathered locally during a national initiative called "Trees of Time and Place." Produce will be sold to fund further projects. Sony Pencoed also has a calendar campaign modeled after the U.S./Canada program.



● Planting Trees in South Korea

Sony affiliates in Asia are active in community and environmental matters in a drive to be model corporate citizens. One example is Sony Electronics of Korea's response to the South Korean government's call for every company to take care of mountains and rivers. The company is taking an active role in the planning of forestry education at Muhak Mountain in the Masan region.

This annual event started on April 5, 1993, a date now designated as South Korea's tree planting day. Initially run by small groups such as mountain climbing clubs, the event has attracted a larger number of participants since 1997. One of the yearly events held by the employees of Sony Electronics of Korea is the creation of a Sony Garden at Muhak Mountain. So far, this event has attracted over 650 participants and led to the planting of more than 200 trees.

● Thai Mangrove Preservation Project

Recognizing the dangers posed by the rapid destruction of Thailand's mangrove forests, Sony took the lead in 1997 in tapping the resources of the Nature Conservation Fund of the Japan Federation of Economic Organizations (Keidanren). The funds are used to support a joint mangrove forestation project under the auspices of the Thai government and a Japanese non-governmental organization. Other Japanese companies have already joined this program, which will extend support over a 5-year period.

● Activities in Japan

Individual Sony business sites in Japan perform their own activities to pick up litter, plant trees and otherwise improve the environment. At Sony Shiroishi Semiconductor, many employees again volunteered to take part in cleaning the banks of the Shiroishi River and distributing food to welcome migrating swans, an annual event at this company.

Sony has published a pamphlet called Philanthropy, detailing all of its community affairs activities. For further information, please contact:

Corporate Community Affairs Department
Sony Corporation Telephone: 81-3-5448-2355
Facsimile: 81-3-5448-3229

Accounting

ENVIRONMENTAL ACCOUNTING

Basic Stance and Outlook on Environmental Accounting

Presently, no uniform international standards exist for governing environmental accounting. Nevertheless, Sony has long pursued a policy of creating an accounting scheme based on its environmental management system. The aim is to reinforce the continuous nature of environmental activities. Information for environmental accounting consists of two inseparable elements: performance (impact), and the cost of environmental activities. This publication is the primary means by which statistics regarding these elements are made public:

1) To what degree are business resources allocated to environmental protection?
2) How much of environmental expenses are absorbed by Sony?

Specific information is disclosed in data sheets included in the back of this report. Plans call for expanded disclosure of the costs of environmental activities as detailed in the table on this page.

In the 1997 fiscal year, Sony estimates that environmental expenses within Japan totaled approximately ¥8,385 million. The major components were as follows: ¥3,716 million for prevention of pollution; ¥2,734 million to reduce Sony's environmental impact; ¥94 million for environmental management systems; ¥493 million to support activities in communities; ¥1,348 million for other items.

Furthermore, in the future, Sony plans to calculate an eco-efficiency ratio based on a detailed analysis of the relationship between environmental performance and corresponding expenses.

Environmental Cost Table for Sony Business Locations

Damage Prevention Expenditures
- Atmospheric pollution
- Water pollution
- Noise and vibrations
- Odors and land subsidence

Risk-related Expenditure
- Education and training expenses for risk management
- Expenditures in line with lawsuits and repairs

EMS-related Costs
- ISO certification
- Office administration
- Environmental education and employee training

"Green" Purchasing

Expenditures to Reduce Environmental Impact
- Energy conservation (Strategy for global warming issue)
- Disposal of industrial waste
- Promotion of recycling
- Strategy for environmental pollutants (Includes preventing ozone depletion)
- Resource conservation (water, paper, fossil fuels)

Expenditures for Information Disclosure and Social Responsibility
- Environmental report creation expense for site
- PRTR-related expenditure
- Social responsibility expenditure for community greenery programs

Environmental Activities Produce Cost Savings

The continuous allocation of business resources is essential to protecting the environment. But a broad-based environmental program can cut expenses as well. Conservation programs can pare electricity bills and reduce the consumption of water, paper and other resources. Furthermore, recycling activities generate revenues through the sale of reusable materials. To illustrate this point, revenues and expenses from recycling activities at Sony Electronics of America are shown below.

Revenues and Expenses of Recycling Programs at Sony Electronics of America

	Waste generated	Waste recycled	Waste disposed	Disposal costs	Recycling revenues
Plastics	7,195	4,313	2,883	$157,997	$433,306
Solvent	1,717	1,446	491	272,695	0
Metal	4,137	3,874	263	8,470	414,620
Glass	6,843	5,950	893	916,390	3,400
Paper	2,857	2,139	719	31,383	17,540
Trash	10,280	1,441	9,065	588,247	0
Wood/Pallet	14,020	11,827	2,180	71,350	30,000
Cardboard	21,604	21,009	575	22,385	648,327
Circuit Boards	1,976	1,891	75	1,850	377,436
Waste Oil	127	94	13	13,594	0
Other non-Hazardous Waste	6,753	1,060	5,668	273,200	2,613
Other Hazardous Waste	1,952	329	1,648	905,386	160,000
Waste Ferric Chloride	2,800	2,800	0	0	140,000
Totals	82,261	58,173	24,472	$3,262,947	$2,227,242

(Waste in tons, Monetary amounts in U.S. dollars)

Disclosure

DISCLOSURE

Sony believes that environmental information is one of the most important components of its obligation with regard to accountability. Reflecting this thinking, Sony has adopted four basic maxims for the disclosure of this information to stakeholders:
1) Honesty, 2) Sincerity, 3) Reliability, 4) Continuity
Sony has three principal means to supply this information to the public: environmental reports, including site reports; bulletins; and advertisements.

● Site Reports

To properly disclose information on risks to stakeholders, and above all communities and residents, Sony's Green Management 2002 states that: "All manufacturing bases must prepare and distribute site reports by the end of March 2000." Heeding this call, several manufacturing bases have already prepared and distributed such reports.

Sony Mizunami's Site Report

Sony Alsace's Site Report

● Sony Eco Plaza

Sony established an Eco Plaza in 1995 at its head office in Tokyo to disseminate information and enlighten employees about environmental issues. To inform the general public as well of the company's activities, the plaza was redesigned. The new exhibition space, now called Sony Eco Plaza, opened in May 1999.

Sony Eco Plaza introduces visitors to the company's broad spectrum of programs, ranging from care exercised in selecting tiny circuit components to research into technologies for the future. Sony believes that products must reflect environmental considerations throughout their entire life cycles—from design and production through their use and eventual disposal. Based on this philosophy, Sony has done its utmost to design the plaza so that visitors can see this cycle for themselves.

Visitors to Sony Eco Plaza are greeted by guides who offer explanations in Japanese and English. They cover subjects as diverse as work at the Sony Environmental Technologies Center, "green" products and viewing the plaza's computer simulations.
For reservations and further information, please contact:
Tel: 81-3-5448-4455
Fax: 81-3-5448-2560

● Eco Plaza in Germany

Europe also has a Sony Eco Plaza. Located within the Stuttgart Technology Center, which includes the Environmental Center Europe, the European plaza is open to the public as well as employees. The facility plays a leading role in Sony's efforts in Europe to increase knowledge about the effects of the company's products on the environment and to reduce their impact. Exhibits include newly developed products, new or improved production processes and some of the organizations in which Sony is active. Since this Eco Plaza is modular, it can be easily transported to make its exhibits accessible to Sony sites throughout Europe.

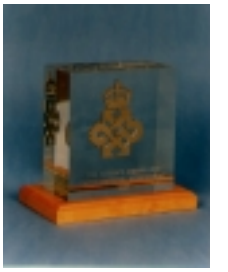
Stakeholder ☞ page 47
Site Report ☞ page 47

HISTORY

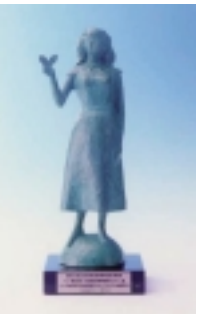
Highlights of Environmental Activities

April	1976	The Environmental Conference is formed, chaired by the President. Prevention of hazardous waste materials and safety and hygiene are promoted in Sony Group operations.
May	1976	The Environmental Science Center is established. Hazardous waste materials and working environments of Group operations in Japan are evaluated.
April	1985	Sony Corporation of America begins environmental audits.
March	1989	A special committee is convened to study measures to eliminate the use of chlorofluorocarbons (CFCs).
August	1990	The President's Policy on the Environment is disseminated among Sony Corporation staff.
October	1990	The Environmental Conservation Committee organization is initiated.
October	1991	The Policy for Product Assessment is formulated.
November	1991	Sony signs the Business Charter for Sustainable Development of the International Chamber of Commerce.
January	1993	The Environmental Fund, a program to support technology related to environmental protection, is inaugurated.
March	1993	The Sony Global Environmental Policy and Environmental Action Plan are formulated and implemented.
April	1993	CFC cleaning agents are eliminated from all production processes of the Sony Group worldwide.
February	1994	The Sony Environmental Award program is launched.
April	1994	The Center for Environmental Technologies (CET) is established within the Sony Research Center.
May	1994	The Greenplus Project is launched.
July	1994	Guidelines for achieving environmental ISO certification are established.
May	1995	Sony Kohda Corporation becomes the first Sony company in Japan to attain ISO-14001 certification.
July	1996	The Sony Deutschland Service Division becomes the first non-manufacturing base in the Sony Group to attain ISO-14001 certification.
October	1996	The Sony Environmental Action Plan is revised. The Green Management Plan 2000 program is established. Sony Semiconductor Company of America wins the San Antonio Water Systems Environmental Excellence Award, which is sponsored by the city of San Antonio.
January	1997	The CCD-TRV91 home-use camcorder is awarded the Energy Conservation Vanguard 21 and Energy Conservation Center Chairman's Award, which was sponsored by the Energy Center Foundation.
April	1997	Sony is awarded the Minister of International Trade and Industry's 6th Environmental Grand Prize, which is sponsored by Fujisankei Group and Nihon Kogyo Shimbun.
June	1997	Sony Manufacturing Company U.K. wins 1997 The Queen's Award for Environment, which is sponsored by the U.K. government. Sony's Environmental Report captures the 1st Environmental Action Plan Grand Prize sponsored by the Japan Environmental Protection Promotion Federation.
December	1997	In Singapore, 4 Sony non-manufacturing bases attain ISO-14001 certification.
April	1998	Composition of Sony Environmental Conservation Committee is revised to give each committee member responsibility for a specific task.
November	1998	The Sony Environmental Action Plan is implemented uniformly across the Sony Group worldwide. The Green Management 2002 program is established. Sony's styrene foam recycling system using limonene captures the 8th Nikkei Environmental Technology Prize, which was sponsored by the Nippon Keizai Shimbun.
December	1998	Sony Magnetic Products (Thailand) are awarded the Thailand Prime Minister's Prize, which is sponsored by the government of Thailand.
February	1999	Sony completed the process of obtaining ISO-14001 certification at all 38 manufacturing bases in Japan.
March	1999	Sony Electronics Inc. receives 1999 Energy Star Home Electronics Partner of the Year Award from the U.S. Environmental Protection Agency.

San Antonio Water Systems Environmental Excellence Award (America)



Fiscal 1997 Queen's Award (Europe)



The 8th Nikkei Environmental Technology Prize (Japan)

The Thailand Prime Minister's Award (Asia)

Explanation of Terms

PRTR (page 21)

1. The PRTR System

The Pollutant Release and Transfer Register dates back to 1992 when the first Earth Summit was held in Brazil. The summit had as its primary objective the formation of an action plan called Agenda 21 for mankind to promote sustainable development strategies. Article 19 covers suitable ways to conduct the environmental management of harmful substances. The article includes risk evaluations of various chemicals, the supply and exchange of related information, risk management and other subjects.

Based on this agreement, the OECD directed in 1996 that member countries prepare and implement a system for registering the release and transfer of pollutants. This system was to be modeled on similar systems in place in Europe and North America. Furthermore, the information was to be formulated so that it could be used by the public.

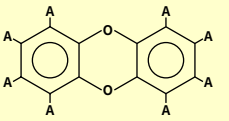
In Japan, Keidanren, through the Environment Agency, implemented a system for monitoring the emissions and movements of chemicals in 1997 at 45 participating industrial organizations.

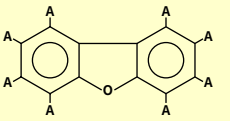
2. How PRTR Functions

1) Monitors emissions, disposals and other releases into the environment (air, water, soil) of potentially harmful chemicals.
2) Data are provided to the applicable government agencies.
3) Data are released to the public either in their unaltered form or after revisions.

Halogen-Free Flame-Retardant Plastics (page 30)

The chemical structure of conventional bromine-based flame-retardant materials closely resembles that of the toxic compounds dibenzo-dioxin or dibenzo-furan. As a result, the reaction of such materials with dioxin or furan compounds can occur quite easily at high temperatures. Preventing these chemical interactions demands the use of "halogen-free" flame-retardant materials, which contain no chlorine, bromine, fluorine or other halogens.


Brominated dibenzo-dioxin
(A— : H or Br)

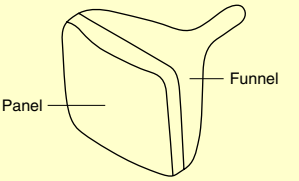

Brominated dibenzo-furan
(A— : H or Br)

CEM-3: A substrate composed of a material made from nonwoven glass fibers and a woven fabric that is copper plated on both sides.

FR-4: A substrate composed of a woven glass fiber fabric that is copper plated on both sides.

Panel/Funnel (page 35)

The panel is the surface over which the image is generated. The funnel-shaped rear section is enclosed with a special type of glass that is impregnated with lead.



CRT= Cathode Ray Tube

Stakeholder (page 45)

In the case of environmental matters, a stakeholder refers to customers, shareholders, other investors, vendors, government agencies, the media, research organizations, non-governmental organizations, employees and all other parties that come into contact with Sony in any manner.

Site Report (page 45)

At Sony, a Site Report is an environmental report issued by an individual business location or business unit.

To Readers of the Sony 1997 Environmental Report

This report does not include a number of articles that were published in the 1997 Sony Environmental Report due to a different report layout and space limitations. For the benefit of readers of the last report, a brief follow-up on selected topics is presented below.

Page of 1997 Report	Activity	Status
8	Recycling dyes in printer ribbons	No recycling system in place yet.
12	Environmental monitoring center	The center continues to measure and analyze working environments in Japan
21	Participation in WBCSD	As of April 1999, Sony is still an active WBCSD member.
24	Promoting of "green" purchasing	a) Purchasing guidelines have been established for each area and activities are proceeding. b) Refer to the procurement discussion on page 27–28. c) Sony is still studying this subject.
25	Stop idling campaign	Sony continues to promote this campaign.
25	Work with Hino Jr. High School	Sony remains in contact with the school but, unfortunately, there has been no further direct interaction on a regular basis.

Articles by Geographic Area

There is no classification of Sony's extensive environmental protection activities by geographic area in this report. Activities performed in Japan and relating to the Sony Head Office are explained throughout the publication. Please use the index below to locate activities in other regions.

Region	Pages
Americas	Energy conservation—pg. 17, Resource conservation—pg. 18; Environmental audits and risk management—pg. 24; Products—pg. 33; Recycling—pg. 37-38; Environmental promotion—pg. 41; Social responsibility—pg. 43; Environmental audits—pg. 44
Europe	Energy conservation—pg. 17, Resource conservation—pg. 18; Reduction and management of chemicals—pg. 22; Research and develoment—pg. 26; Design support—pg. 31; Products—pg. 33; Sales and logistics—pg. 34; Recycling—pg. 36, 38; Education and training—pg. 40; Environmental promotion—pg. 41; Social responsibility—pg. 43; Disclosure activities—pg. 45
Asia (outside Japan)	Energy conservation—pg. 17, Resource conservation—pg. 18; Reduction and management of chemicals—pg. 22; Products—pg. 33; Recycling—pg. 37; Education and training—pg. 40; Environmental promotion—pg. 41; Social responsibility—pg. 43

The spectacular Rainbow Lorikeet is found mainly on the east coast of Australia and Tasmania in forests that have been designated as world heritage sites.

Sony welcomes questions, comments and suggestions regarding the environmental activities of the entire Sony Group. Please contact us at any of the following locations:

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This report is available on Sony's home page at http://www.world.sony.com/eco/

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SONY

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