

CASIO

Environmental Report 2002



2002

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Editorial Policy

- This Environmental Report 2002 was prepared on the basis of the Ministry of the Environment's (MOE) "Environmental Report Guidelines" (2000 edition).
- In response to last year's questionnaire results, this year's report employs many figures, tables, and images. Efforts have also been made so that Casio Green Product descriptions and other textual items are easy to read.
- The report explains the Casio Group's business activities and environmental aspects, describes the group-wide environmental philosophy, environmental policies, institutions, Environmental Action Plan, and other environmental management efforts to reduce the impact of the group on the environment, and presents the achievements of individual initiatives.
- To facilitate two-way communication with readers and provide information, the back cover gives contact information and our website URL. There is also a separate questionnaire form.

About the Data

- **Energy Consumption**
Data have been compiled in accordance with the method set forth in the electric and electronics industry's Voluntary Plan for Energy Consumption. The CO₂ conversion coefficient for electricity and fuel consumption is that used in the same plan.
- **Wastes**
Data are compiled in accordance with the definitions for emissions and recycling of wastes prescribed by the electric and electronics industry.
- **Air and Water Pollution**
The report uses data from compliance certificates under the Air and Water Pollution Control Laws.
- **Pollutant Release and Transfer Register (PRTR)**
Data are compiled in accordance with PRTR Guidelines (revised in March 2001) for the electric and electronics industry.
- **Designations of Casio Business Operations**
The division that produces liquid crystal displays and other electronic components is called the Electronic Component Division, while that producing electronic equipment is called the Electronics Equipment Division. (Last year's report called these "electronic component facilities" and "assembly/processing facilities," but here they are changed to make them readily understandable to the general reader.)

Period and Scope

- This Environmental Report 2002 mainly summarizes the Casio Group's environmental conservation initiatives for FY2001 (April 1, 2001 to March 31, 2002).
- Environmental performance data compiled and published are those for all Casio Group domestic sites except for sales, service, and information processing. These data therefore represent most of the group's domestic environmental burden.
- The Casio Computer Hachioji Laboratory is included in the Electronic Component Division, and the Head Office, Hamura Research & Development Center, and Tokyo Product Control and Technical Center are included in the Electronics Equipment Division.

Scope	Casio Group sites		Main businesses	Number of sites	
1- Scope of Environmental Action Plan	Scope of Compiled and Published Environmental Performance Data	Casio Computer Co., Ltd.	Head Office *2	Head Office functions	1
			Tokyo Product Control and Technical Center	Development, design, and materials procurement for system equipment	1
			Hamura Research & Development Center	Development, design, and procurement for electronic calculators, electronic timepieces, etc.	1
			Hachioji Laboratory	Research and development for electronic devices (LCDs, etc.)	1
	Domestic	Electronic Component Division	Kofu Casio Co., Ltd.*3	Manufacture of electronic calculators, mobile information devices, systems equipment, LCD devices, plastic parts, molds, and other products	2
			Kochi Casio Co., Ltd.	Development and manufacture of liquid crystals and other electronic devices	1
			Casio Micronics Co., Ltd.*3	Development, manufacture, and sales of electronic devices	2
		Electronics Equipment Division	Yamagata Casio Co., Ltd.*3	Manufacture of electronic timepieces, communications equipment, and other products	2
			Aichi Casio Co., Ltd.	Manufacture of digital cameras, electronic musical instruments, communications equipment, and other products	1
			Casio Electronic Manufacturing Co., Ltd.*2	Manufacture of page printers	1
			Casio Refre Co., Ltd.*2	Refurbishing and sales of electronic calculators and other electronic equipment	5
			Casio Techno Co., Ltd.*2	Repair, sales, and maintenance of equipment and other electronic equipment	1
			Casio Media System Co., Ltd.*4	Manufacture and sales of home audio equipment	2
CCP Co., Ltd.*4	Manufacture and sales of toys and sundry goods				
	Others (sales, service, information processing, and other sites)				
Overseas	Group companies				

*1: Overseas facilities are not included in the Environmental Action Plan for energy conservation, waste reduction, and green procurement.
*2: Facilities added since FY1998. *3: New sites added since FY2000. *4: Facilities added since FY2000.

Top Commitment



Working toward the Recycling-based Society

In the 21st century — the environmental century — the Casio Group perceives its corporate role as “building the recycling-based society to conserve the global environment and achieve sustainable development,” and to that end we conduct a wide range of environmental activities.

In FY2001 the Casio Group was presented with an entirely new set of circumstances by the passage of the Basic Law for Establishing a Recycling-Based Society, the Law for the Promotion of Utilisation of Recyclable Resources, and the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Service by the State and other Entities.

Further, with the ratification of the Kyoto Protocol in June 2002, the Casio Group is making renewed efforts at saving energy to stem global warming.

To address these circumstances, we set up a new program to recover and recycle used information and communications equipment from corporate users. This program commenced after gaining authorization from the Ministry of Economy, Trade and Industry (METI) and the MOE.

In product design we have systematized technologies for lightweight, compactness, and power saving as the Casio Group’s own

unique standards for environmental conscious design, which we have defined as “Green Products.”

The Green Product concept signifies that products are not merely energy-saving, but also strive toward the three Rs (reuse, reduce, and recycle). Environmental consciousness is the added value created by Green Products.

Henceforth we plan to set Green Products at the core of our product line, expand them to include items such as our new solar-powered and radio-controlled watches and credit-card-sized LCD digital camera, and raise the proportion of such products in our total sales.

Through these environmental initiatives we will reduce the environmental burden of products throughout their life cycles, and at the same time strive to use less energy and generate less waste at our facilities, thereby mitigating our environmental burden through the totality of Casio Group activities.

This Environmental Report 2002 provides the details and achievements of the Casio Group’s environmental activities from our FY2001 global perspective. We hope that it will help as many readers as possible understand our efforts, and that readers’ frank opinions and observations will help us broaden the scope of our endeavors.

July 2002

Kazuo Kashio
President

梶尾和雄

Benefitting the Environment with Cutting-Edge Technology



Executive Vice President Kashio

Since its foundation, Casio has always striven to “benefit society through creative products.” Now that the environment is considered paramount, engineers working on technologies in areas such as timepieces, digital cameras, and recycling got together with Executive Vice President Yukio Kashio, one of the company’s founders, and Managing Director Osamu Shimizu for an enthusiastic discussion on what Casio technology can do for the environment.

• Designing the environment into products

To keep making environmentally compatible products that deeply impress customers is one’s social responsibility as a manufacturer, and it also helps grow one’s business.

The fundamental thinking behind Casio’s product creation — “lightweight, compactness, and power saving” — performs double duty for the environment by leading to resource- and energy-saving technologies.

Customers of course expect quality, function, and reasonable pricing from manufacturers, but eco-compatibility is also an important consideration. **(Kashio)**

Through Green Product development, the Casio Group tries to mitigate the environmental burden throughout a product’s total life cycle (from planning, development, design, procurement, production, and sale, to the customers’ product use, disposal and recycling). **(Yamada)**



Yamada

• More green products needed

In 2001 the Casio Group established its “Casio Guidelines for Green Product Development” to facilitate the making of environmentally conscious products.

When developing a new product, we try to make it environmental conscious from the two perspectives of its “environmental design” and



Ozawa

“environmental compliance.” New products are rigorously assessed, and only those which meet the Casio’s Standards are approved as Casio Green Products. **(Ozawa)**

The first Green Product we developed was a USB electronic calculator. It obtained the Eco Mark, and what’s more the calculator and cable do not contain vinyl chloride and lead-free solders are used. **(Deguchi)**



Deguchi

The life cycle assessment (LCA) concept is important in making environmental conscious products. At Casio we especially work on minimizing the environmental burden of a product during customer use. **(Yamada)**

And that resulted in our solar-powered and radio-controlled watch. The solar power technology developed for the watch eliminated the environmental burden of spent batteries. For its microprocessor, the most important part, we used a newly developed LSI (SOI) that consumes 50% less power than previous processors. At a glance it looks like an ordinary wristwatch, but it incorporates several innovative technologies. **(Kasuo)**



Kasuo

Liquid crystal panels in digital watches and cellular phones have until now been the most energy-consuming component, but recently the idea of using sunlight as backlight assumed tangible form, and we developed a liquid crystal panel that saves energy and is also easy to see. We’ll build it into many products from now on. **(Sawatsubashi)**



Sawatsubashi

We are now putting all our efforts into developing fuel cells, which are indispensable as a next-



Engineers from many fields push the envelope: “How can Casio help the environment?”

generation energy supply. In the near future many Casio products will use them. Our work is directed at making them endure long-term use, as well as reducing size and improving function. **(Managing Director Shimizu)**

Our digital photo developer digital photo vending machine is helping reduce pollutant emissions because it can make just the number of prints one wants when they're needed, and without using developing fluid or film. Sometime I'd like to perform an LCA to show that its environmental burden is smaller than that of film photographs. **(Mizushina)**



Mizushina

• Eco-compatibility is now a business requirement

Since the Green Purchasing Law became effective in April 2000, more and more customers, especially corporations, are saying they'll buy only environmental conscious products. In recent years there's been a jump in the use of the general stationery supply catalog for corporate users, but these days we can't have our products listed in the catalog unless they're environmentally compatible. We mustn't hesitate to incorporate environmental concerns when developing products. Since we're all here, I'm taking this opportunity to ask this of everyone, from sales to development and manufacturing. The “Eco-Tape” consumable used in the Name Land resulted from just such a requirement. We're also working on its recovery and recycling. **(Ono)**



Ono

Pursuant to the Law for the Promotion of Utilisation of Recycled Resources, we received authorization from METI and MOE, and have begun recycling used PCs and information and communications equipment

from corporate users. In collaboration with a parcel delivery service, we got the jump on other companies by starting the recovery service, accepting even single units, and at the same price nationwide. Casio recycles 96.7% of the PCs it recovers. **(Nakazawa)**



Nakazawa

• Profit through environmental management

I'd like to dig into Casio's “lightweight, compactness, and power saving,” develop high-added-value products like solar-powered and radio-controlled watches, credit-card-sized LCD digital camera, and fuel cells, and profit through environmentally conscious business.



Managing Director Shimizu

• In-house communication about environmental technology

Today's topic led to much useful discussion, and I'd like to see these ideas used in green product development meetings for sharing environmental technologies. Sales personnel too should perceive the environment as basic to their jobs, and make it part of their work. **(Yamada)**

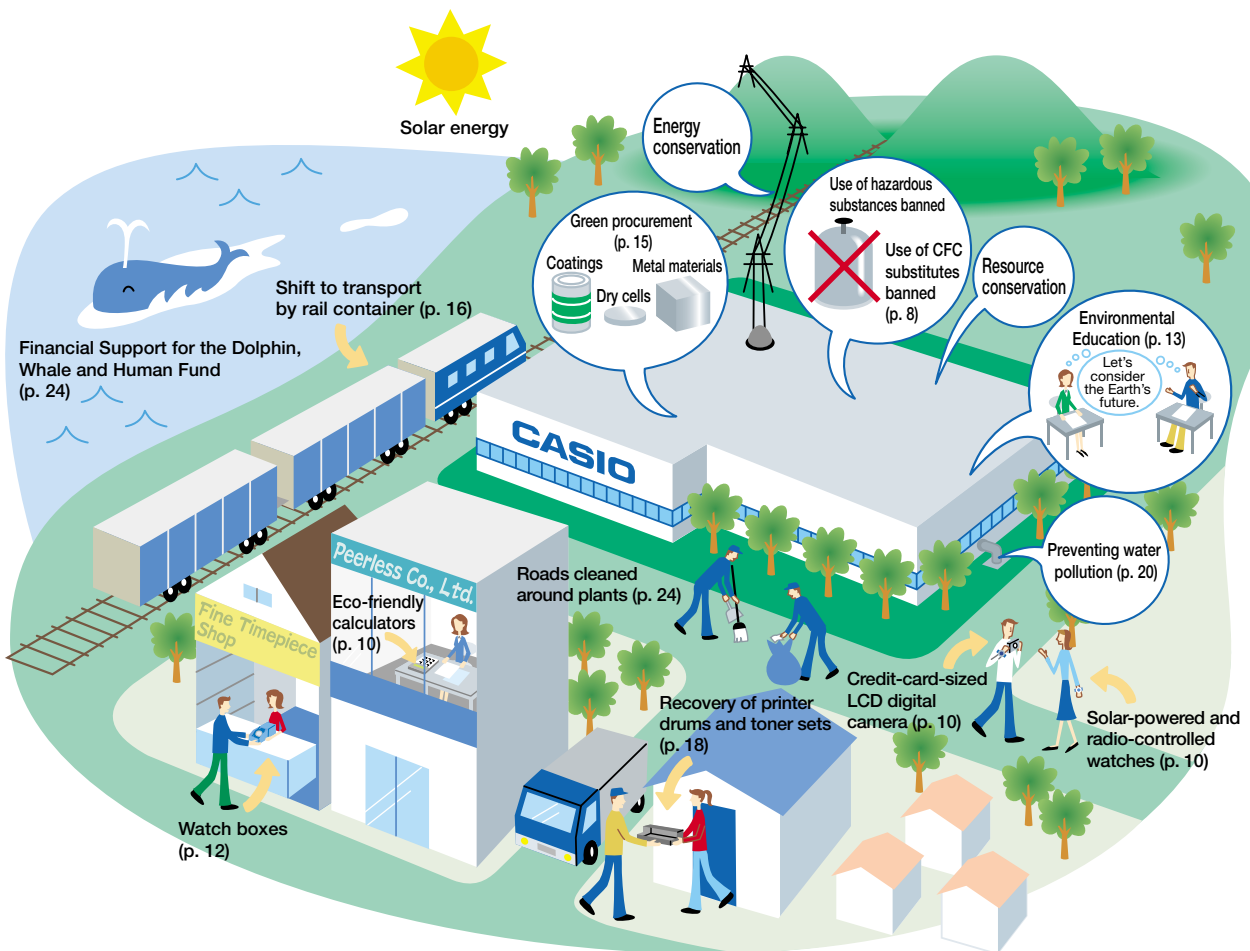


The Participants

Department	Name	Area of responsibility
Executive Vice President	Yukio Kashio	
Managing Director	Osamu Shimizu	
General Manager Quality & Environment Center	Yoshinobu Yamada	
Assistant Manager Planning Section, Development Dept.-1 Consumer Unit-1, Development HQ	Koji Deguchi	Electronic stationery
Leader Product Development Group PV project Development Center	Takahiro Mizushina	Credit-card-sized LCD digital camera
Manager, CES Marketing Section Consumer & Educational Products Department Global Marketing Headquarters	Takuya Ono	Sales
Design Section Manager TFT Department, Electronic Device Division	Takeshi Sawatsubashi	LCD devices
Leader Development Dept. Timepiece Division	Tomoo Kasuo	Timepieces
Leader Information Technology System HQ.	Yoneo Nakazawa	Recovery system
Environmental Management Section, Quality & Environment Center	Naofumi Ozawa	Environmental management

The Casio Group's Relationship with Society and the Environment

Casio's Conduct of Business



The Casio Group's business operations cover a broad range comprising development, design, procurement, production, sales, service, and recycling.

In development and design, we put new efforts into expanding solar-powered radio-controlled watches and credit-card-sized LCD digital camera as "Green Products" characterized by lightweight, compactness, and power saving.

In a bid to achieve a green procurement target of 80% in FY2003, we are moving toward this target beginning with domestic suppliers.

Production sites are actively participating in activities aimed at achieving Environmental Action Plan for reducing the amounts of energy and water used and

their emissions of wastes and carbon dioxide (CO₂), and also in community conservation activities.

Since 1994, Casio has been supporting the International Dolphin & Whale Conference as a way of doing our part for society.

Our recovery and recycling program is saving resources by recycling printer consumables (drums and toner sets), rechargeable batteries, and information and communications equipment that corporate users have scrapped.

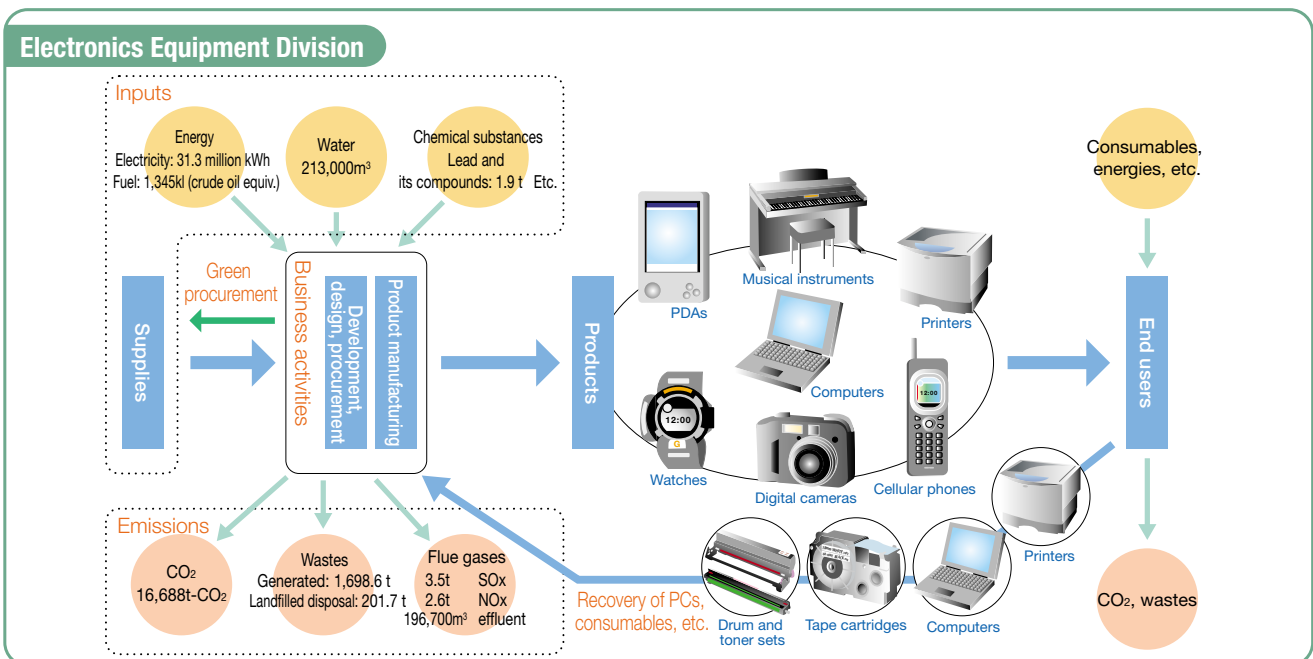
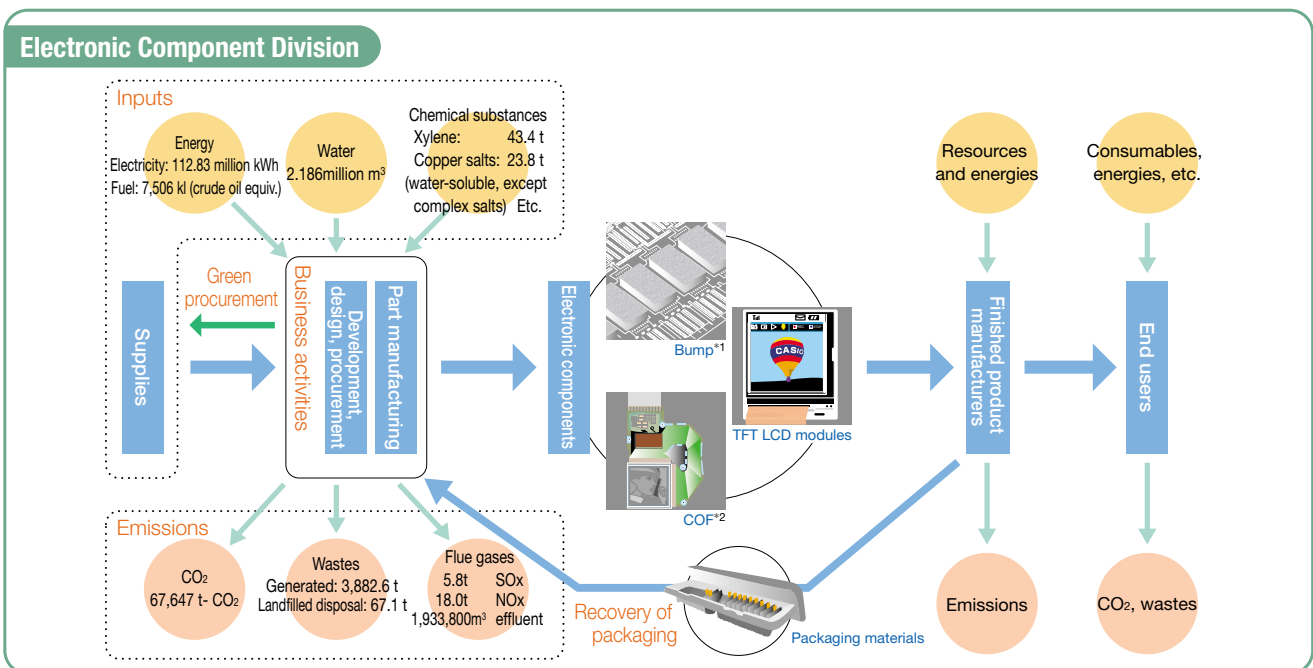
Casio employees receive environmental education by means of programs conducted via ISO 14001 maintenance and improvement.

Casio's Inputs and Outputs (environmental burdens imposed by inputs and emissions of materials and energy)

Casio's operations are divided into an Electronic Component Division that manufactures liquid crystal displays and other electronic components, and an Electronics Equipment Division that manufactures various kinds of electronic equipment. The environmental aspects that the Casio Group can directly control are development, design and procurement, and the inputs and emissions of facilities involved in manufacturing. Environmentally

conscious development and design activities, green procurement activities, distribution measures, and other efforts help indirectly reduce the environmental burdens of product use and disposal, procurement activities with suppliers, and product transport.

The Electronic Component Division tends to use more energy and water, and generate more wastes, CO₂, and other emissions, which gives it a larger environmental footprint.



Glossary

Bump

A technology for forming small projections (pins) on LSIs for joining LSI chips with chip-on-glass (COG) or tape carrier package (TCP) assemblies.

COF

Chip-on-film. A method of directly joining an LSI chip to a thin resin film to achieve high-density packaging of LSI circuits in a limited space.

Environmental Action Plan “Clean & Green 21” Initiative

Casio Environmental Charter

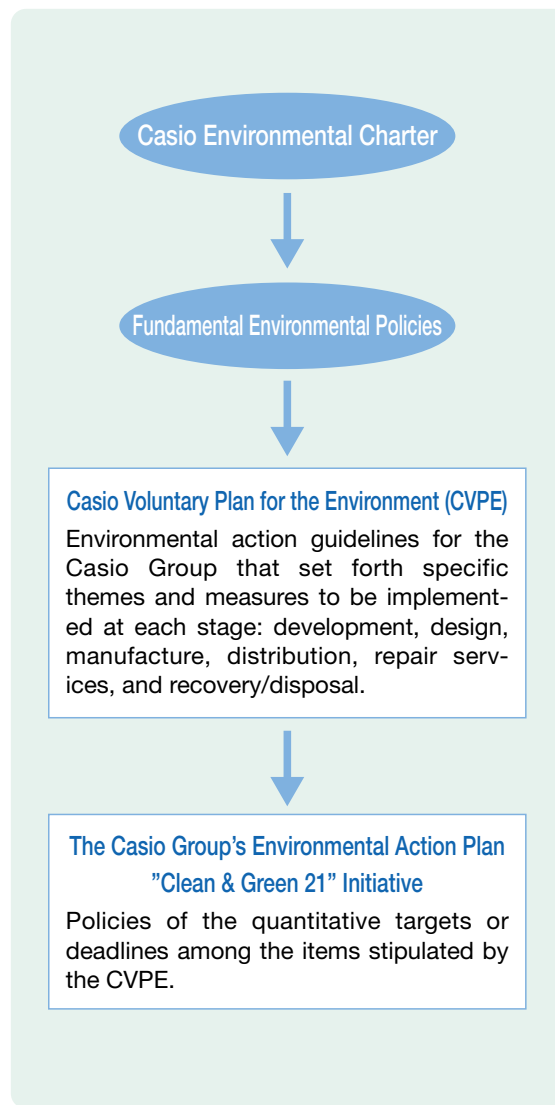
To conserve the global environment, Casio recognizes the importance of its corporate environmental responsibility across the operations of its entire group. Casio establishes basic policies and specific measures for contributing to world prosperity and human happiness from the broad perspective of international society, and endeavors to implement them.

Fundamental Environmental Policies

1. Casio Group members shall comply with all environmental laws, agreements, and standards in Japan and overseas.
2. The Group shall establish voluntary “Casio Environmental Conservation Rules”^{*1} based on consideration for the environment at all product stages of development, design, manufacture, distribution, repair services, and recovery/disposal. All Casio business divisions shall assume responsibility for their implementation, additionally auditing the degree of compliance and making continual improvements.
3. From the standpoint of corporate social responsibility, and as good corporate citizens, all Casio Group members shall apprehend the importance of global environmental conservation and try to heighten their awareness.
4. These Policies shall apply to all Casio Group business divisions in Japan and overseas.

^{*1} The Casio Environmental Conservation Rules are specific action programs for environmental conservation, set forth in the “Casio Voluntary Plan for the Environment (CVPE).”

From the Casio Environmental Charter and Fundamental Environmental Policies to Environmental Action Plan



Casio Group Environmental Action Plan

The Casio Group formulated the Voluntary Plan for the Environment (CVPE) in January 1993 to implement the Casio Environmental Charter and the four Fundamental Environmental Policies, and began pursuing environmental conservation activities as a group-wide effort. In November 2000 the CVPE was revised for the sixth time in response to changing social circumstances and progress in our activities.

The CVPE stipulates “Casio Environmental Conservation Rules,” as specific action programs for environmental conservation at each stage: development, design, manufacture, distribution, repair services, and recovery/disposal.

Based on these rules Casio established the Casio Group's Environmental Action Plan “Clean & Green 21” Initiative in June 1996. The Initiative explicitly sets forth specific quantitative targets and implementation deadlines for energy conservation, waste reduction, and other environmental activities, and clarifies the medium-term action plan for the entire Casio Group. Efforts are underway to implement the plan.

The facing page presents the June 2002 revisions to the Environmental Action Plan.

FY2001 Progress on the Casio Group's Environmental Action Plan "Clean & Green 21" Initiative

Product-related initiatives

Items	FY2001 Targets	FY2001 results	Newly added targets for FY2002
Eco-friendly product development target	FY2003 Green products account for 30% of sales	Green products account for 3% of sales	Continuing 20% reduction in packaging material use by FY2003 (compared to FY2000)
Hazardous substance phaseout target	From FY2001, gradually increase products using lead-free solder Totally phase out leaded solder by FY2004	Already began using lead-free solder in products during FY2001 Calculator: Eco-friendly calculators Watch: G-SHOCK Three product types added this year Total of 10 product types	Removed from FY2002 targets Continuing Discontinue by 2005 the use of the substances lead, cadmium, mercury, and hexavalent chromium specified in the RoHS Directive*

Facility-related initiatives

Items	FY2001 Targets	FY2001 results	Newly added targets for FY2002
Energy conservation targets	Carbon dioxide (CO ₂) emissions per unit manufactured compared to FY1990 FY2005 10% cut FY2010 25% cut	Increased 19.2% over previous year largely owing to increased energy use in the pre-production operation and adjustment in conjunction with enlargement of Casio Micronics (Yamanashi) and Kochi Casio. FY2005 target attainment appears likely because of smooth production start.	Continuing
Waste reduction targets	Achieve zero emissions (no landfilled wastes) by FY2005. FY2005 Reduce waste generation per unit manufactured by 30% (compared to FY2000).	Thanks to sorting, recycling, and other efforts, wastes landfilled in FY2001 were 269 t, down 75% from the 1,087 t of FY2000. Target attainment on schedule because of intensified efforts. Thanks to sorting, recycling, and other efforts, 5,581 t of wastes were generated in FY2001, down 1,033 t (15.6%) from the 6,614 t of FY2000. Although partly attributable to decreased production, a 6% drop in waste generation per unit manufactured over the previous year indicates steady progress.	Continuing Continuing
Hazardous substance phaseout targets	Phase out use of CFC substitutes* in the group by the end of FY2001. Phase out use of CFC substitutes at all production sites including subcontractors by end of FY2002. By FY2005 detoxify PCB-containing equipment in storage.	By the end of FY2001, the Casio Group had met its goal of completely phasing out CFC substitutes. Currently used by some suppliers (2 domestic companies, 1 overseas), but total phaseout scheduled for the end of September 2002. The Casio Group has 19 capacitors (4 still in use) and 258 small ballasts fluorescent lamp that contain PCBs. Best detoxification method under consideration.	Removed from FY2002 targets The phrase "phaseout by end of 2002" expanded to include new subcontractors and changed to "be sure of phaseout by end of 2002." Continuing
Gain certification under ISO 14001 (environmental management system)	All Casio Group overseas production sites acquire certification by end of FY2001.	All major domestic and overseas sites initially planned to do so had certification by the end of FY2001.	Removed from FY2002 targets
Green procurement implementation targets	FY2003 Green procurement rate of 80% from domestic suppliers	Domestic site suppliers had 61% green procurement rate (as of end of May 2002).	Continuing

Glossary

Substances designated by the RoHS Directive

Hazardous substances designated by the Restriction of Hazardous Substances (RoHS) Directive, which will likely take effect throughout the EU in 2006. The substances are lead, mercury, cadmium, hexavalent chromium, PBBs (polybrominated biphenyls), and PBDEs (polybrominated diphenyl ethers).

CFC Substitutes

Substances used in the semiconductor manufacturing process for cleaning and as refrigerants in refrigerators and other appliances in place of CFCs, which deplete the ozone layer. They include hydrofluorocarbons (HFCs).

Emission / Waste generation per unit manufactured

CO₂ emission per unit manufactured (t CO₂/¥1 million), obtained by dividing CO₂ emissions (t CO₂) by production (¥1 million), and waste landfilling per unit manufactured (t/¥1 million), obtained by dividing wastes generation (t) by production (¥1 million).

Green Products through Product Assessment

Making Ecologically Compatible Products

Under its Casio Voluntary Plan for the Environment (CVPE), the Casio Group conducts product assessments of new products. In May 2001 we created the "Casio Guidelines for Green Product Development"* to clarify standards for taking the environment into account and to facilitate the making of eco-compatible products. In accordance with these guidelines we prepare product environmental audit sheets that are used to conduct product assessments from the planning stage.

* Casio Group Guidelines for Green Product Development

These guidelines establish procedures for auditing and assessing the process of making eco-compatible products at every stage from product planning to design for the development of environmentally sound products (Casio Green Products).

Product Assessment Process

Product assessments are conducted at three stages: the first at the product planning stage, the second when determining the design, and the third when deciding to start mass production.

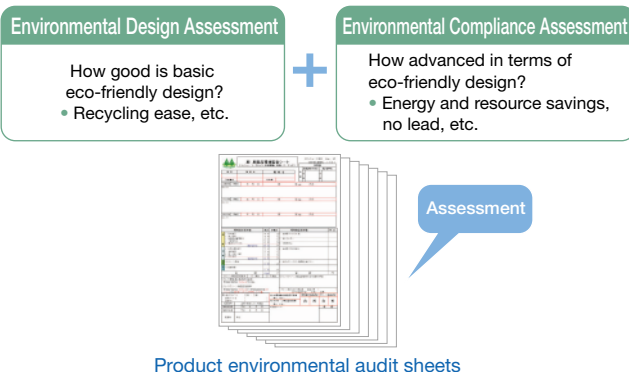
Assessment results are audited and confirmed by the Quality & Environment Center.

Product Assessment Results

Product type	FY2000 results	FY2001 results
Electronics Equipment Division products	60	121
Electronic Component Division products	61	45
Total	121	166

How Product Assessments Work

Product assessments comprise the two components of environmental design and environmental compliance. Assessing environmental design involves rating basic eco-compatible design such as design for easy recyclability, while assessing environmental compliance entails determining how much more advanced a product's environmental design is than previous or competing products in terms of energy and resource conservation, elimination of lead, and other considerations. Products that satisfy both standards, or that qualify for a type I eco-label (Eco Mark, Blue Angel, etc.) become authorized "Casio Green Products."



In-house Standards for Green Products

1. Consumer Product Assessment Contents

- Musical instruments
- Digital cameras
- Cellular phones
- Timepieces (clocks, watches)
- Electronic dictionaries
- Electronic stationery
- Electronic calculators
- LCD TVs
- PDA's (personal use)

Minimum required score is 90 out of total 100 points.	
Environmental design assessment	1 Material labeling for recycling
	2 Easily recyclable structure
	3 Use of common type of resin
	4 Easy disassembly
	5 Easy battery recycling
	6 Reuse of packaging materials
	7 No hazardous chemicals
	8 Segregated packaging materials
	9 Use of recycled resources
	10 Purchased from green supplier
	11 Production facility uses no CFC substitutes or chlorine-based solvents

Qualification under at least two of five items	
Environmental compliance assessment	1 Resource-saving, recyclability: products other than timepieces (watches) Safety (allergies): timepieces (watches)
	2 Energy conservation
	3 Good disassembly for easy part sorting, shortened disassembly time
	4 Resource-saving and easily recyclable packaging
	5 No hazardous substances: lead solder, halogenated flame retardants, PVC, etc.

2. System Products Assessment Contents

- Printers
- Handheld terminals
- Office computers
- PCs
- PDA/HPC (for business users)
- Slip issuing system (Rakuichi)
- Electronic cash registers/POS terminals

Minimum required score is 90 out of total 900 points.	
Environmental design assessment	1 Energy conservation
	2 Reducing resource use
	3 Reuse
	4 Recycling
	5 Easy processing
	6 Environmental soundness
	7 Packaging materials
	8 Information disclosure
	9 User manuals, catalogs, etc.

Qualification under at least two of nine items	
Environmental compliance assessment	1 Top runner in resource savings
	2 Top runner in energy savings
	3 Top runner in environmental burden
	4 No lead
	5 No hazardous substances
	6 No chrome
	7 No PVC
	8 Qualified for energy-saving label
	9 Recovery/recycling

Casio Green Products (Environmentally Conscious Products)

Some Authorized Green Products

Eco-friendly Calculator

This Earth-friendly photocell-powered calculator's case is made of 100% recycled materials, and it contains no hazardous substances. It is an early example of the use of lead-free solder.



Solar-powered and Radio-Controlled Watch

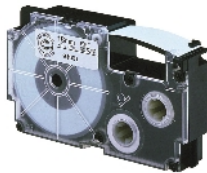
This watch not only keeps accurate time using the standard time signal, but also needs no battery because it is powered by the sun. Its silicon-on-insulator (SOI) technology reduces the circuit packaging area and power consumption (LSI section uses 50% less power than before).



* SOI: A C-MOS IC wafer structure in which circuits are set in a thin oxidized layer on a Si substrate.

Label Printer Eco-tape

The spent cartridge recovery and recycling formerly only for corporate users has now been extended to all products (excluding special products). The cartridges now use 100% recycled materials, and we actively promote recovery and recycling even from general consumers through retail stores.

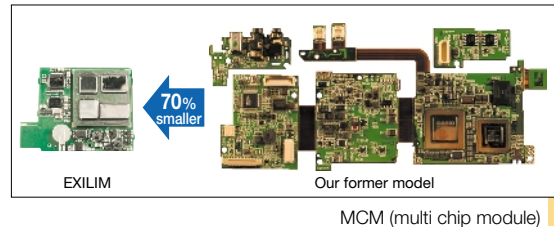


Credit-card-sized LCD Digital Camera

Casio's advanced high-density packaging technology (multi-chip module, or MCM*) substantially reduced the circuit packaging area by about 70%. We also achieved an approximate one-third reduction in power consumption and noise. The camera harmonizes technology and ecology, and it has an easily recyclable stainless steel case.



*MCM: A technology that modularizes four chips — CPU, ASIC, SRAM, and flash memory — at the silicon chip level.



Products Using Lead-free Solder*

As part of our efforts to reduce hazardous substances harmful to human health and the environment, in 1999 our Eco-friendly calculators began using lead-free solder, whose use has now expanded to 10 models. In 2002 Casio was first to use this solder in watches.

Casio set a target of totally phasing out leaded solder by FY2004, and we are currently assessing the reliability of lead-free solder in various products.



G-SHOCK



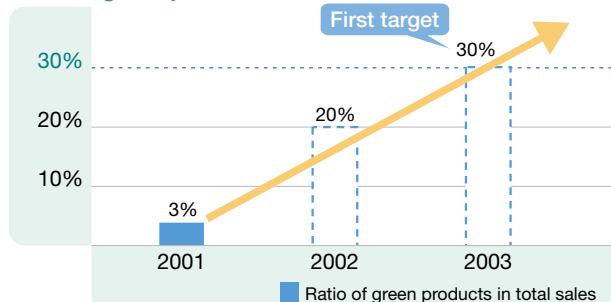
Eco-friendly calculator

Boosting Sales of Green Products to 30% of Total

Casio plans to boost sales of Green Products to 30% of total sales on a value basis in FY2003.

By pursuing this goal, we are endeavoring to make products in which the environment is added value.

Ratio of green products in total sales



Glossary

Lead-free Solder

Currently used solder is an alloy of tin and lead, which is frowned upon environmentally because lead leaches out

of discarded printed circuit boards. Lead-free solder dispenses with lead, a hazardous heavy metal, and combines tin with silver, copper, or other metals.

New Vision of Green Products

Fuel Cells: A New Environmentally Benign Power Source

In March 2002 Casio successfully completed the research and development for a small, high-performance fuel cell. Further development is underway for use in products in 2004.

Fuel cells generate power through a reaction between the hydrogen in alcohol, etc. on the one hand, and oxygen in the air on the other hand. There is no troublesome charging because one can keep using them by supplying more fuel.

Fuel cell types are the "direct type," which is structurally simple but low-output, and the "reformer type," which produces high output but is structurally complex and difficult to make small. Casio worked on reducing the size of the reformer type, which extracts hydrogen from its fuel, so that it can be combined with portable information equipment. By applying our unique semiconductor

processing technology and condensing our "microreactor technology," we succeeded in making the reformer into a postage stamp-sized plate, thereby achieving both compactness and high performance. This fuel cell's continuous use time is at least four-fold that of the usual rechargeable Li-ion batteries, and it weighs about half as much. (This comparison assumes the cell is used with a Casio notebook PC.)



The long, slim part is the fuel cell.

Casio reports the environmental burden of green products as found by life cycle assessments (LCAs).*

This table shows the results of an environmental burden analysis using the simple LCA method on our model JS-20 Keco-N Eco-friendly calculator. Five stages are covered: materials procurement, product manufacture, transport/distribution, use, and recycling/disposal.

Environmental burden is indicated quantitatively.



Eco-friendly calculator (JS-20 Keco-N)

Eco-calculator life cycle assessment analysis results (one calculator)

Category	Environmental burden type	Units	Stage				Stage total*7		
			Materials procurement	Product manufacture	Transport/distribution*5	Use*6		Recycling/disposal	
Use (inputs)	Energy consumed	MJ*1	31.57	85.66	0.05	0.00	0.21	117.49	
		Mcal*2	7.54	20.45	0.01	0.00	0.05	28.05	
	Fossil fuels*3	kg	0.54	1.83	0.00	0.00	0.00	2.37	
	Mineral resources*4	kg	0.19	0.00	0.00	0.00	0.00	0.19	
	Wood	kg	0.14	-	-	0.00	-	-	
	Water	kg	116.08	2.12	-	0.00	0.05	-	
Emissions (outputs)	Atmospheric emissions	CO ₂	kg	8.41	5.50	0.00	0.22	0.10	14.23
		SO _x	g	7.76	0.34	0.00	0.00	0.00	8.10
		NO _x	g	7.89	3.05	0.00	0.00	0.00	10.94
	Water emissions	BOD	g	-	-	-	0.00	0.00	-
		COD	g	0.08	-	-	0.00	0.01	-
	Soil emissions	Solid wastes (dry)	kg	0.02	0.00	0.00	0.00	0.22	0.24
		Sludge (wet)	kg	0.04	-	-	0.00	0.00	-
	Waste liquids	kg	-	-	-	-	-	-	

0.00: Calculated value is comparatively negligible.
 -: Data cannot be calculated or estimated.

*1 MJ (megajoules): 10⁶ J (1J = 4.19 x 1 cal).
 *2 Mcal (megacalories): 10⁶ cal (*1 and *2 are both heat quantity units).
 *3 Fossil fuels: coal, petroleum, and natural gas.
 *4 Mineral resources: iron ore, copper ore, bauxite, etc.

*5 Transport distance is set at 100 km.
 *6 Usage time is assumed to be 10 years.
 *7 Results for all stages are totaled only for those environmental burden types whose cells include no "-" but contain numerical values. Stages with a "-" have no totals in their total cells.

Glossary

Life cycle assessment (LCA)

A method of quantitatively assessing the environmental burden imposed by a single product over its entire lifetime

including materials procurement, product manufacture, transport/distribution, use, and recycling/disposal.

Reducing the Use of Resources in Packaging

Benefitting the Environment through Packaging Innovation

The Casio Group works mainly through its Packaging Committee to reduce the amount of packaging used, to use recycled resources, and to make packaging smaller. The entire group actively strives to diminish

environmental burden by extending this initiative from improvement of individual packages to the reform of packaging distribution.



Hideki Sakurai, Section Manager
Packaging Committee Design Center

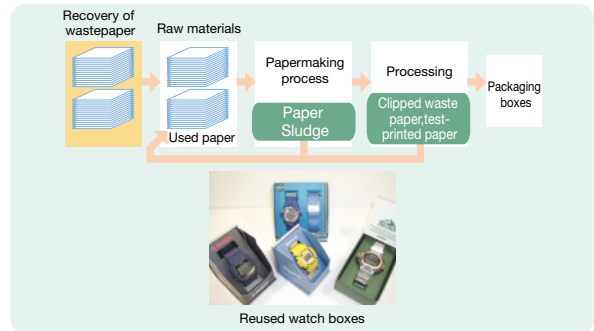
1. Packaging-related Environmental Initiatives

- **Cut use of packaging materials**
Make 20% cut in amount of packaging material used by the end of FY2003 (compared to FY2000).
- **Reduce use of polystyrene foam**
Switch from polystyrene foam to paper-based materials.
- **Use of recycled resources**
Actively use recycled paper and resins.
- **Returnable packaging**
Use same packaging repeatedly (in an effort to eliminate wastes)
- **LCA research**
Use LCA data to develop packaging with low environmental burden.

5. Using Recycled Materials

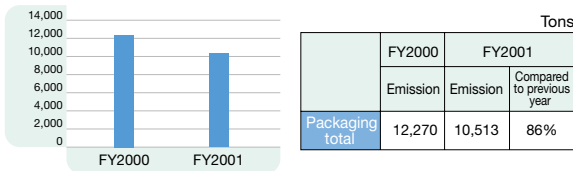
- **Increase use of recycled paper**
 - Increase use of pulp molds
 - Increase use of recycled paper through a closed system*

Increase use of recycled paper through a closed system

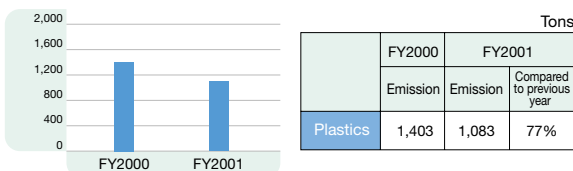


2. Total packaging used in FY2001

(Packaging materials used: total emissions of plastics, polystyrene foam, paper, cardboard)

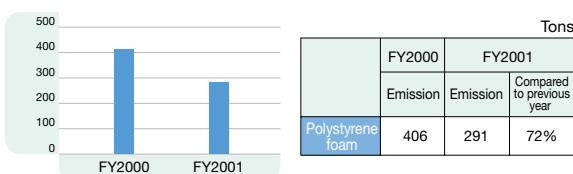


3. Amount of resin materials used in FY2001



Resin use cut 50% by changing packaging form and materials.

4. Amount of polystyrene foam used in FY2001



Switching from polystyrene foam cushioning material to pulp molds

Since June 2001 we have been recycling documents discarded from the Hamura Research & Development Center and using them as packages for G-SHOCK watches. Paper used in the center for designing and administrative tasks is collected in special recycling boxes and sent to packaging manufacturers, that make it into boxes for products.

For even greater environmental friendliness, we elected not to apply coatings that would make the packaging harder to recycle. Although non-coated paper board has the drawbacks of poor coloring and gloss, we took advantage of those characteristics to produce a design of subdued sophistication.

6. Packaging-related LCA initiatives

When designing packaging, we have to consider how serious is the environmental burden produced, give quantitative values to material selection, processing, production, disposal, and other items, and then find ways to decrease them.

Our concrete efforts for this purpose were to calculate LCA values for each packaging type, and create environmental burden determination criteria allowing us to predict the magnitude of environmental burden when designing the packaging.

From now on we shall use that LCA data in further efforts to develop and improve packaging with a lower environmental burden.

Glossary

Closed system

This describes a closed loop in which in-house use is made of recycled materials that use Casio-made packag-

ing materials and other items as part of their raw materials.

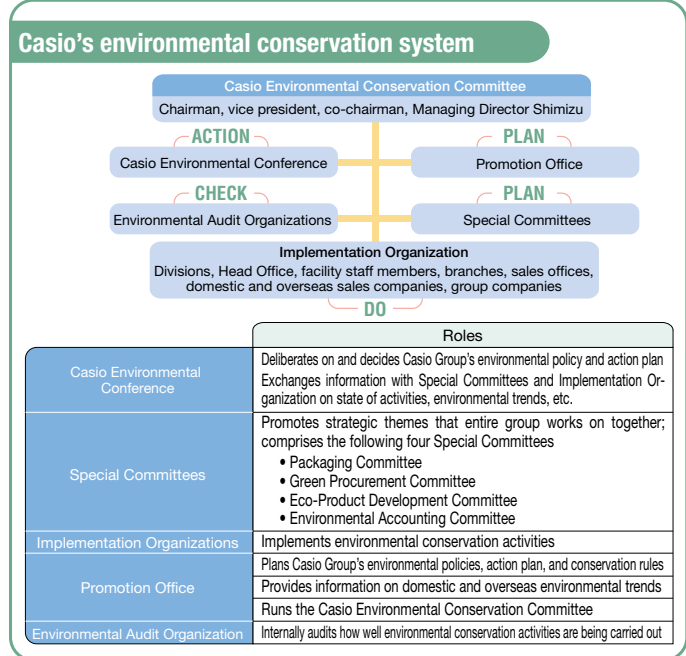
Thorough Environmental Management

The Thinking Behind Environmental Management

The environmental management system (EMS) is an important tool that places each company department into one of the parts of our PDCA (Plan-Do-Check-Action) cycle, and brings about environmental management through continual improvement of environmental initiatives.

The Casio Group strives, both as a group and at individual facilities, to diminish environmental burden.

The Casio Voluntary Plan for the Environment (page 7) and the Environmental Action Plan (page 8) are seen as a group-wide plan. Each facility uses its environmental management system to provide for continual improvement and to reduce its environmental burden.



Casio Environmental Conference

The Casio Environmental Conference meets twice a year to discuss and decide policies, plans, and other matters relating to the Casio Group's environmental conservation activities. By pursuing these in an integrated manner, the Conference endeavors to enhance environmental conservation.



Environmental Education

1. Total Environmental Education and Seminars

Casio conducts environmental education and awareness activities making it possible to be constantly mindful of the environment. New employees are given general environmental education before being assigned. General education gives all employees a thorough awareness of environmental issues and policies, goals, plans, and the like, while specialized education gives intensive procedural training to employees whose tasks have heavy environmental burden. Casio also provides the latest information on environmental laws and regulations, ISO 14001-related matters, the Casio Voluntary Plan for the Environment, industry trends, and other environment-related items. Through other activities, such as the inclusion of articles on environmental

activities in our in-house monthly magazine (page 25), Casio works to raise its employees' consciousness and give them shared expertise.

2. Site-specific Education and Seminars

Individual facilities that have obtained ISO 14001 certification endeavor to improve environmental awareness and knowledge through general and specialized education conducted separately for general employees, managers, environmental officers, and other distinct employee categories.

In FY2001 our efforts included tours of individual facilities at environmentally advanced companies, tours of final waste disposal sites, participation in classes on controlling global warming, and participation in energy conservation training sessions.

Glossary

ISO 14001

An international standard containing requirements for a company or an organization to set its own environmental policy and to construct a mechanism (environmental

management systems) for implementing, on a continual basis, a series of programs including planning, implementation operation, checking and corrective action, and management review.

Obtaining ISO 14001 Certification

The Casio Group has endeavored to get each facility certified because it believes that ISO 14001 certification is an effective means to standardize in-group environmental management systems and to work on continual improvement of environmental conservation activities.

In FY2001 certification was acquired by Casio Soft in Japan, and by the overseas sites Asahi Electronics (Thailand) Co., Ltd., Casio (Taiwan) Ltd., and Casio Electronics (Shenzhen) Co., Ltd.

Already during FY2002 Casio Techno Co., Ltd. in Japan and Casio Electronics (Zhongshan) Co., Ltd. in China have completed certification. Our certified facility total now stands at 13 domestic facilities and 12 overseas facilities.

ISO 14001-certified Facilities

As of June 2002

	Sites	When certified
Domestic	Aichi Casio Co., Ltd.	Jan 1997
	Yamagata Casio Co., Ltd.	Nov 1997
	Kofu Casio Co., Ltd.	Jan 1998
	Kochi Casio Co., Ltd.	Mar 1988
	Casio Electronic Manufacturing Co., Ltd.	Sep 1999
	Casio Refre Co., Ltd.	Jan 2000
	Casio Micronics Co., Ltd.	Mar 2000
	Casio Computer Co., Ltd., Tokyo Product Control and Technical Center	Jun 2000
	Casio Computer Co., Ltd., Hamura Research & Development Center	Oct 2000
	Casio Computer Co., Ltd., Hachioji Laboratory	Oct 2000
	Casio Computer Co., Ltd., Head Office	Dec 2000
	Casio Soft Co., Ltd.	Dec 2001
	Casio Techno Co., Ltd.	May 2002
Overseas	Casio Korea Co., Ltd.	Apr 1998
	Casio Electromex S.A. de C.V.	Dec 1998
	Casio Computer (Hong Kong) Panyu Factory	Sep 1999
	Casio Computer (Hong Kong) Ltd.	Dec 1999
	Casio (Malaysia) Sdn. Bhd.	May 2000
	Asahi Industries (Malaysia) Sdn Bhd.	Aug 2000
	Casio Electronics (Zhuhai),	Sep 2000
	Pt. Asahi Electronics Indonesia	Feb 2001
	Casio (Thailand) Co., Ltd.	Sep 2001
	Casio Taiwan Ltd.	Dec 2001
	Casio Electronics (Shenzhen) Co., Ltd.	Feb 2002
	Casio Electronics (Zhongshan) Co., Ltd.	Apr 2002

Risk Management

Casio conducts environmental risk management activities through the operation of ISO 14001 environmental management systems.

• Complaints and Accidents

In FY2001 there were no environment-related complaints or accidents.

• PRTR*

Each facility prepares a manual in accordance with the revised edition (March 2001) of the PRTR guidelines for the electric and electronics industry. Facilities track each substance and submit reports for substances whose emissions exceed prescribed levels.

• PCB-containing Equipment in Storage

As of the end of FY2001, four Casio Group facilities had a total of 19 capacitors (four still in use) and 258 small ballasts fluorescent lamp that contain PCBs. The capacitors are kept in special storage boxes to keep them from tipping over, and the small ballasts are kept in stainless steel barrels. All are under strict safekeeping that includes regular inspections. Increases since FY2000 includes spent units that were put in storage.

• Hazardous Air Pollutants

The Casio Group uses none of the 13 substances specified for control in the "Guidelines for Promoting Self-imposed Control of Hazardous Air-polluting Substance by Companies" established in October 1996 by the Ministry of Economy, Trade and Industry.

• Groundwater Monitoring

We perform regular tests of groundwater quality at regular intervals every year, but we have yet to detect hazardous substances exceeding the standard values.

Glossary

PRTR

The Pollutant Release and Transfer Register for chemical substances that may be hazardous to human health and the ecosystem is a program under which the gov-

ernment uses information from reports submitted by businesses to compile data on the transfers of substances and their releases to the air, water, and soil.

Green Procurement in Japan and Overseas

Green Procurement by the Casio Group

Pursuant to its Casio Group Green Procurement Standard Manual, the Casio Group preferentially buys components with low environmental burden from eco-conscious suppliers. Casio asks all its suppliers of products, components, and raw materials to assess the state of ISO 14001-based environmental management systems in their production facilities, and the energy- and resource-saving qualities, recyclability, and hazardous chemical substance content of products for purchase. We started this research in FY2000. Its results are put into a database and used as criteria for the preferential procurement of green components and for green product development.

Casio gives the name “green suppliers” to factories that meet our environmental standards, and the name “green components” to components that are produced at those factories and that meet our standards. The proportion in monetary terms of green components in total part purchasing from regular suppliers is defined as our “green procurement ratio.”

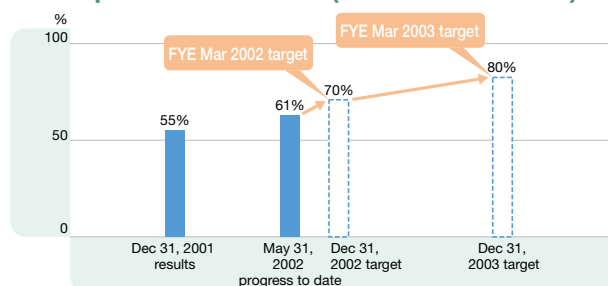
To help push the green procurement ratio higher, we determine three internal indicators called “green operation rate,” “green supplier ratio,” and “green component ratio.”



Green Procurement Committee
Plan-execution Section
Strategic Procurement Division
Hiroshi Yamada, Director

$$\text{Green procurement ratio (\%)} = \frac{\text{Green components purchasing (¥)}}{\text{Total components purchasing (¥)}} \times 100$$

Green procurement ratio (domestic facilities)



FY2001 Achievements

Our domestic facilities' green procurement ratio at the end of FY2001 was 55% (that year's target was 50%), and we are now working to attain 70% at the end of FY2002. We have also published an overseas edition of our Casio Group Green Procurement Standard Manual, and have begun green procurement at our overseas production facilities.



A green procurement presentation in China

Future Initiatives

We shall continue efforts to raise our green procurement ratio to attain the environmental action target of “80% domestic green procurement ratio in FY2003.” While preferentially purchasing green components, we shall request improvements of suppliers not yet meeting standards, and ask for cooperation from suppliers that have yet to respond.

Casio Group Green Procurement includes investigating the content of chemical substances of potential harm to the environment. We have designated 9 banned substances and 18 substances for reduction. Components containing banned

substances must not be purchased, and we cooperate with suppliers in decreasing any substances for reduction found in their components. We plan to database this information and use it to reduce hazardous chemical substances in products, to comply with WEEE, RoHS,* and other environmental laws and regulations, and to obtain eco-labels.

These data are maintained and managed so that the assessment database will allow us to correctly choose parts and materials with low environmental burden at the development and design stages.

Glossary

WEEE & RoHS

European Union directives on electric and electronic equipment. They require the recovery and recycling of

discarded equipment, and prohibit the inclusion of lead, cadmium, mercury, hexavalent chromium, PBDEs, and PBBs in products.

Improving Distribution Efficiency

Current Initiatives

1. Modal Shift*

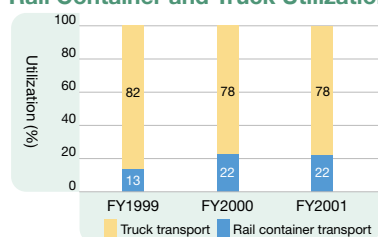
Our policy is to switch to rail freight transport from trucks, which impose a heavy environmental burden.

Our achievements so far:

1) Utilization rate

By volumetric ratio, 22% of our freight goes by rail container, and 78% goes by truck. These percentages are the same as FY2000.

Rail Container and Truck Utilization



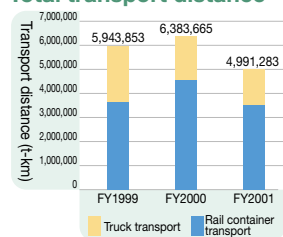
* The Environmental Report 2001 used data for a typical transport route, from the Suzuka Distribution Center to the Tobu Delivery Center.

In the Environmental Report FY 2002, data for all transport routes were used to calculate utilization and total transport distance.

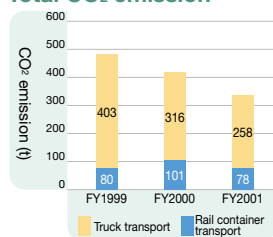
2) CO₂ Reduction

Total transport distance decreased 1,392,382 t-km from FY2000. The breakdown of decreases is 1,064,665 t-km by rail and 327,717 t-km by truck. This reduced total CO₂ emissions 81 t from FY2000, the decrease breakdown being 23 t for rail and 58 t for trucks.

Total transport distance



Total CO₂ emission



2. Fewer Delivery Trucks

We cut CO₂ emission 2.9 t by switching from chartered trucks especially for Casio products to ordinary parcel delivery services.

No. of trucks cut Nine two-ton vehicles
 Avg. distance traveled 77.1 km/vehicle/month = CO₂ reduction 2.9 t
 925.2 km/vehicle/year

Calculation: 9 vehicles x 925.2 km/vehicle/year x 2 t x 48 g-C x 44 / 12 = 2.9 t CO₂

Future Initiatives

1. Joint Delivery

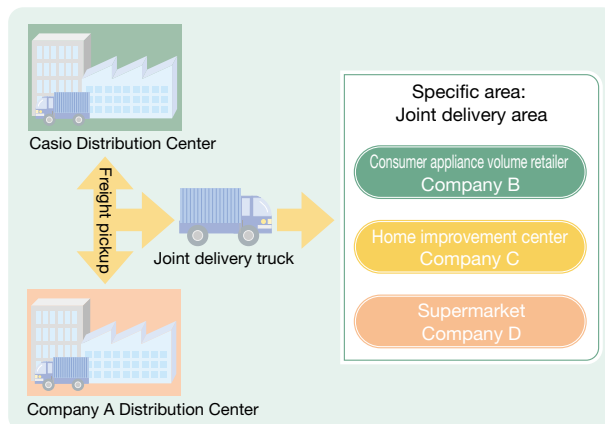
In cooperation with distribution companies affiliated with other manufacturers, Casio is currently pursuing joint delivery to large retailers in certain areas in Tokyo and other places.

From now on Casio will actively continue and expand joint delivery for both internal and sales distribution.



Logistics Department
Business System Headquarters
Yasuyuki Tsukamoto

An example of joint delivery in sales distribution



2. Distribution-inspired Efforts to Improve Packaging Design

Casio is working on improvements to product packaging design in an effort to diminish our environmental burden through better distribution efficiency.

1) Smaller box volume

- Reconsider external box material: Make cardboard as thin as possible.
- Reconsider excess space in boxes: Reduce excess space as much as possible without hindering insertion of product.
- Simplified packaging: Packaging form should reduce use of materials to the maximum.
- Discontinue inner boxes: Discontinue inner boxes enclosing small lots, and put products directly into external boxes.

2) Adopt returnable packaging

- Use resin boxboard that can be used many times.
- Use returnable simplified packaging for large products.

3) Review dropping and vibration standards

- Reduce box volume and materials through a review of dropping and vibration standards.

Glossary

Modal shift

The freight transport shift from trucks, the current primary means, to trains and other means that carry

larger volumes in a single load.

Product Recovery and Recycling

Casio Ideas on Recovery and Recycling

Many industrial products are made primarily with resources extracted from underground, such as oil and minerals. Since these resources are limited, it is clear they will be exhausted in the future if people continue extracting them as now. It is essential that we quickly reduce the further extraction of resources while reusing those which we already have.

Casio began recovering corporate-user tape cartridges from our Label Printer electronic stationery

in FY1999, and printer drums and toner sets for printers in FY2000.

In FY2001 we started recovering PCs, information and communications equipment, and rechargeable batteries from corporate users, and in FY2002 we began recovering the tape cartridges from consumer label printer appliances.

Specific Actions for Recovery and Recycling

1. Recovery and recycling of PCs and other products

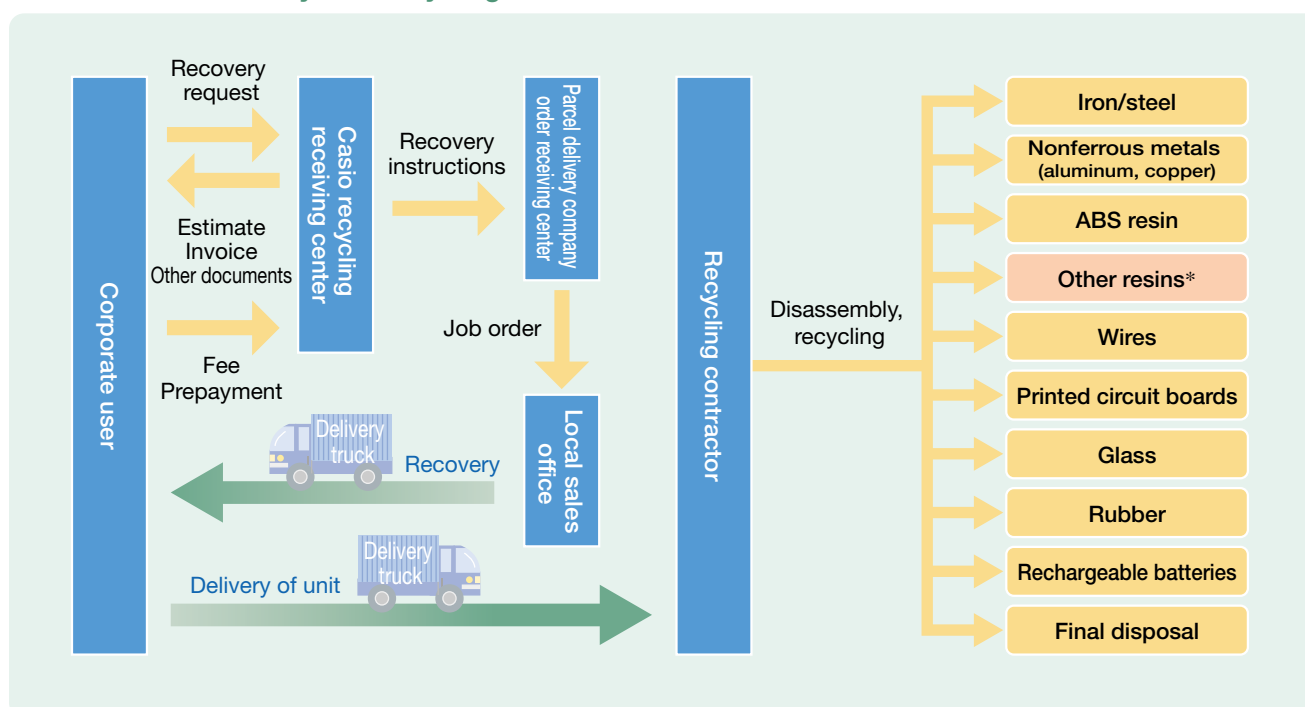
With the idea that promoting recovery and recycling necessitates creating a program by which one visits customers to take back used products, we worked out a take-back program with a parcel delivery company last year, and on February 21, 2002 launched a full-scale take-back program for corporate users (see flowchart below).

Recycling of recovered products started last year, and we have attained a 96.7% recycling rate for PCs. With plastic resins, for example, ABS resin is reused as a raw material. Other resins* that we were previously unable to reuse as raw materials are used

as the protective covers for optical fibers and other signal cables, as tire stops in parking lots, and other applications.

- **Recovered products:** Casio PCs, Servers, Work stations, Printers, Monitors, Handheld terminals, Electronic Cash Registers/POS terminals, and other information and communications equipment.

Procedure for Recovery and Recycling of PCs and Other Products

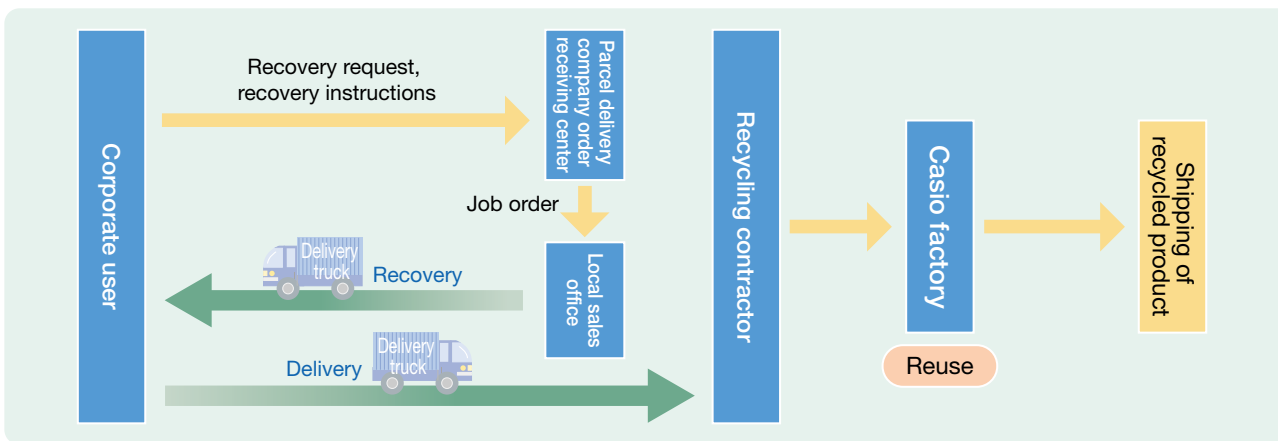


2. Recovery and Recycling of Consumables

1) Printer Drums and Toner Sets

We provide free take-back services for corporate-users (See flowchart below).

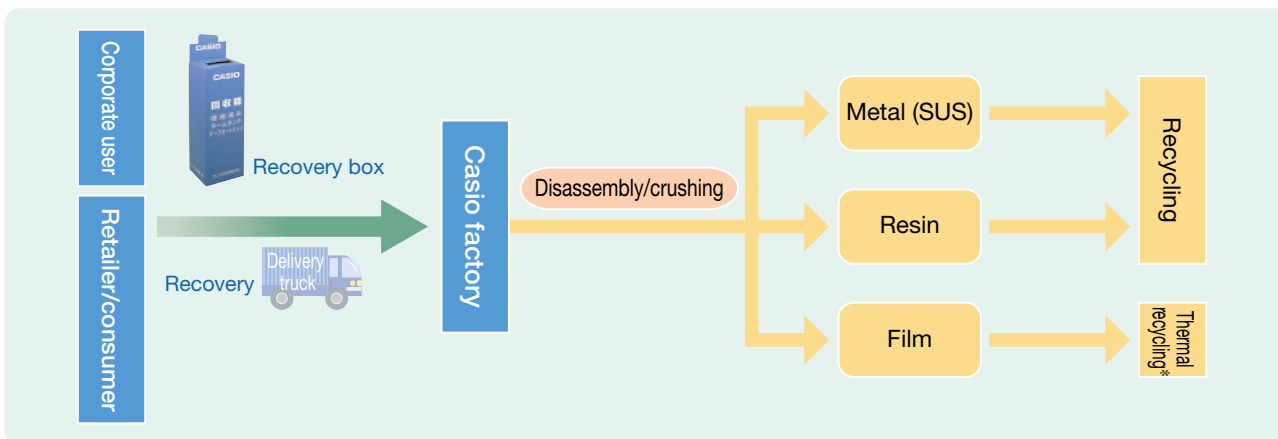
Procedure for Recovery and Recycling of Printer Drums and Toner Sets



2) Tape cartridges of label printer electronic stationery

In addition to recovery of cartridges from corporate users, we began recovering them from consumers via retailers in June 2002 (see flowchart below).

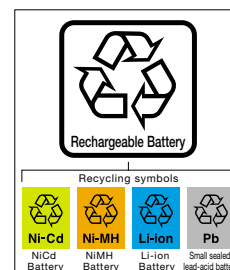
Procedure for Recovery and Recycling of Label Printer Tape Cartridges



Recovery and Recycling of Rechargeable Batteries

Rechargeable batteries are used to power PCs, digital cameras, and other products. Their materials include nickel (Ni), cadmium (Cd), cobalt (Co), lead (Pb), and other scarce resources. Creating good programs and recycling are important for using these resources without wasting them.

Casio is a member of JBRC. We have put secondary battery recovery boxes in service stations and other locations and seek to gain the cooperation of retail stores and consumers in battery recovery and recycling.



These are recycle symbols on batteries. Put them in this box at the store.



Glossary

Thermal recycling

Use of heat from combustion of wastes that cannot be recycled otherwise.

Publicly Disclosed Environmental Accounting

For FY2001 our accounting was performed under the 2002 version of the Ministry of the Environment's "Environmental Accounting Guidebooks."

Environment-Related Capital Investments and Costs

Environment-related capital investment in FY2001 amounted to ¥1,545 million owing to an investment by the Electronic Component Division of about ¥1,200 million in Kochi Casio's new Plant 3rd.

Electronics Equipment Division investment was ¥24 million in FY2001, down from the ¥229 million in FY2000, which included ¥200 million by Casio Electronic Manufacturing Co., Ltd. Total investment therefore came to ¥1,569 million, for a substantial increase over FY2000.

Total costs came to ¥949 million, for a slight increase of ¥52 million over the previous year. The reason that the management activity cost component decreased ¥32 million was that in FY2000 many facilities completed their ISO 14001 certification.

Resource cycling costs alone grew ¥18 million, but the breakdown contains that costs for waste reduction and recycling were up ¥68 million over the previous year, while those for final waste disposal declined ¥54 million, indicating that zero-emission efforts are paying off.

Economic Benefit of Energy and Resource Conservation

Overall, economic benefit was down ¥35 million to ¥279 million, which was because the cost-cutting effectiveness of energy conservation showed a considerable decline of ¥225 million due to increased utility costs. This is the result of an electricity charges increase of ¥190 million over the previous year due to, in the Electronics Equipment Division, the expansion of operations at Casio Electronic Manufacturing, and, in the Electronic Component Division, the startup of Kochi Casio's 3rd Plant and the start of a new business at Casio Micronics' Yamanashi facility.

Meanwhile, a total savings of ¥204 million over FY2000 was attained through cost reduction by resource reuse, waste cost reduction, and cost reduction by resource conservation.

Conservation Benefit

Thanks to the increased recovery of printer drums and toner sets by Casio Electronic Manufacturing, our overall amount of reused and recycled resources increased 424 t, and the amount of landfill decreased 818 t. Total CO₂ emissions increased 5,330 t over the year before, which was the result of increased energy use by Casio Electronic Manufacturing, Kochi Casio, and Casio Micronics' Yamanashi facility. Water use increased slightly.

Environment-Related Capital Investments and Costs

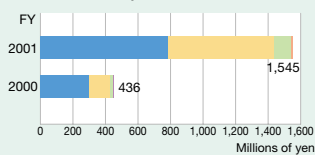
Millions of yen

Category	Capital investment amount									Costs								
	Electronic Component Division			Electronics Equipment Division			Total			Electronic Component Division			Electronics Equipment Division			Total		
	2000	2001	Change	2000	2001	Change	2000	2001	Change	2000	2001	Change	2000	2001	Change	2000	2001	Change
Business area costs	435	1,543	1,108	220	20	-200	655	1,563	908	281	302	21	189	227	38	470	529	59
(1) Pollution prevention costs	300	783	483	211	9	-202	511	792	281	107	138	31	11	16	5	118	154	36
(2) Global environmental costs	128	650	522				128	650	522	9	18	9	5	1	-4	14	19	5
(3) Resource circulation costs	7	110	103	9	11	2	16	121	105	165	146	-19	173	210	37	338	356	18
Upstream/downstream costs													82	114	32	82	114	32
Management activity costs				1		-1	1		-1	67	61	-6	146	120	-26	213	181	-32
Research and development costs		2	2	8	4	-4	8	6	-2		4	4	90	65	-25	90	69	-21
Social activity costs	1		-1				1		-1	15	17	2	27	39	12	42	56	14
Environmental damage costs																		
Environmental conservation cost total	436	1,545	1,109	229	24	-205	665	1,569	904	363	384	21	534	565	31	897	949	52

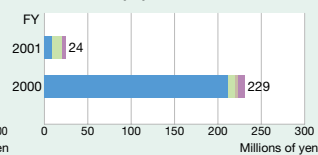
Note: The table includes only those research and development costs whose main purpose is clearly mitigating environmental burdens. There were no environmental damage costs (such as environmental remediation costs or environmental lawsuit costs).

Capital Investment

Electronic Component Division

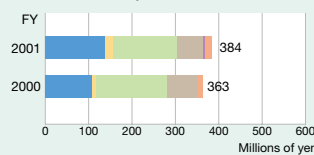


Electronics Equipment Division

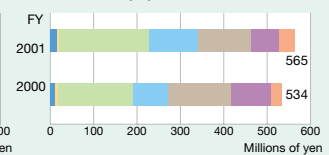


Costs

Electronic Component Division



Electronics Equipment Division



Economic Benefit of Energy and Resource Conservation

Millions of yen

Type of benefit	Electronic Component Division			Electronics Equipment Division			Costs		
	2000	2001	Change	2000	2001	Change	2000	2001	Change
Sales of used parts, materials and other valuable goods	6	7	1	15		-15	21	7	-14
Cost reduction by resource reuse	2	3	1	185	305	120	187	308	121
Waste cost reduction		41	41		4	4		45	45
Cost reduction by energy conservation	92	-117	-209	12	-4	-16	104	-121	-225
Cost reduction by resource conservation		36	36	2	4	2	2	40	38
Total effects	100	-30	-130	214	309	95	314	279	-35

Table includes only economic benefits calculated according to sound premises.

Environmental Conservation Benefit

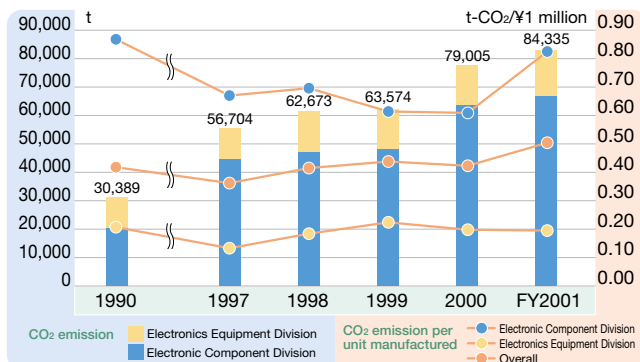
Environmental performance items	Unit	FY2000	FY2001	Change from previous year
Reused/recycled resources (group total)	t	98	522	424
Recycling after consumable recovery (Casio Electronic Manufacturing)	t	165	405	240
Landfill (group total)	t	1,087	269	-818
CO ₂ emissions (group total)	t-CO ₂	79,005	84,335	5,330
CO ₂ emissions (9-facility total)*	t-CO ₂	41,733	37,533	-4,200
Water use (group total)	1000m ³	2,246	2,399	153

Nine facilities: Kofu Casio (Head Office and Ichinomiya), Casio Micronics (Ome), Yamagata Casio, Casio Head Office, Hamura Research & Development Center, Tokyo Product Control and Technical Center, Casio Techno, and CCP.

Environmental Performance

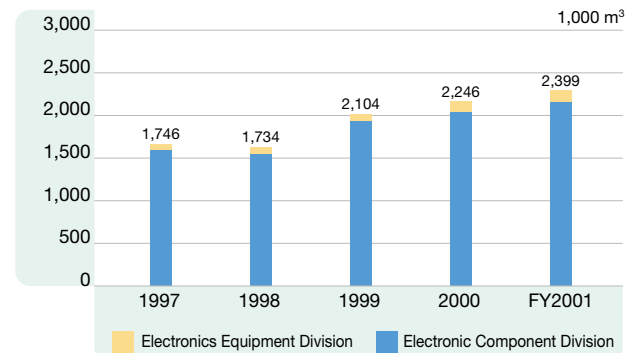
This section on environmental performance deals with items likely having large environmental burdens for the Casio Group as a whole.

CO₂ emission



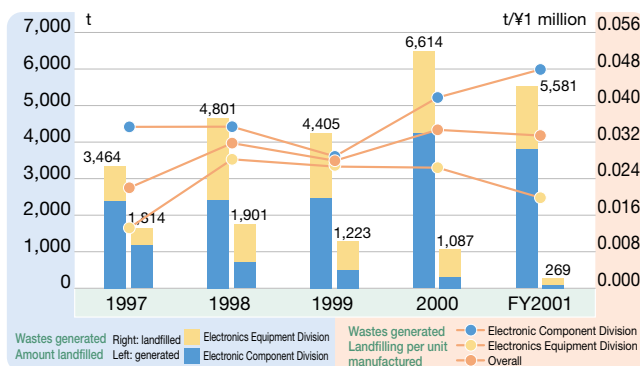
During the last five years, expansion of the energy-intensive Electronic Component Division has increased CO₂ emission. In FY2001 both total emission and emission per unit manufactured were higher than in FY2000 owing to energy consumption by pre-production adjustment work in conjunction with facility expansion at two sites.

Water Use



Water use increased owing to expansion of the Electronic Component Division, which uses much pure water in washing processes, but efforts are being made to reduce use through the adoption of closed systems and other means.

Wastes Generated and Landfilled



More wastes are generated because of higher production, but the amount of landfill decreases year by year thanks to reuse and recycling efforts.

Releases and Transfers of Class I Designated Chemical Substances under the PRTR Law, FY2000 and 2001

Tons

Names of Class I Designated Chemical Substances	Substance no.	FY2000											FY2001												
		No. of reporting facilities	Amount	Released to				Transfer to			Consumption	Re-removal	Recycled	No. of reporting facilities	Amount	Released to				Transfer to			Consumption	Re-removal	Recycled
				Air	Public water supply	Soil at site	Landfill disposal at site	Sew-erage	Wastes	Air						Public water supply	Soil at site	Landfill disposal at site	Sew-erage	Wastes					
Antimony and its compounds	25												1	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.7	0.0	0.0
Ethylbenzene	40												1	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2
Ethylene glycol	43												1	1.8	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	
Xylene	63	1	91.8	18.4	0.0	0.0	0.0	0.0	73.4	0.0	0.0	0.0	2	43.4	6.0	37.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2-ethoxyethyl acetate	101	1	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	9.9	3.3	0.0	0.0	0.0	0.0	6.6	0.0	0.0	0.0	0.0	
1,1-dichloro-1-fluoroethane *1	132	1	19.0	18.3	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.2	1	3.1	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	
Thiourea	181	2	6.4	0.0	0.0	0.0	0.0	0.0	6.4	0.0	0.0	0.0	2	9.5	0.0	0.0	0.0	0.0	0.0	9.5	0.0	0.0	0.0	0.0	
Water-soluble copper salts	207	2	27.2	0.0	0.0	0.0	0.0	0.0	27.2	0.0	0.0	0.0	2	23.8	0.0	0.0	0.0	0.0	0.0	23.8	0.0	0.0	0.0	0.0	
Toluene	227	1	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Lead and its compounds	230												1	1.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	
Hydrogen fluoride and its water-soluble salts	283	1	5.3	0.3	0.3	0.0	0.0	0.0	4.7	0.0	0.0	0.0	1	6.9	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	

Antimony and its compounds, ethylbenzene, and ethylene glycol were handled in greater amounts due to expanded operations at electronic component facilities in FY2001. Handling of lead and its compounds grew because of expanded operations at electronic equipment facilities.

0.0: None handled.

Site-Specific Information

FY2001 Site News

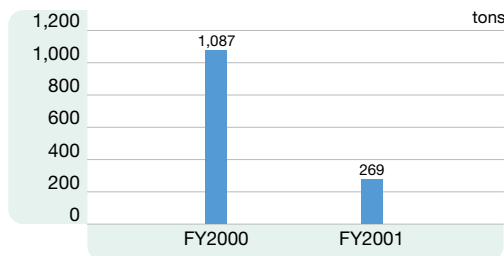
Facilities achieving zero emissions

The Casio Group defines landfilling no more than 1% of one's wastes as zero emissions, which in FY2001 was achieved by the following three facilities.

- Kofu Casio (Head Office)
- Kofu Casio (Ichinomiya)
- Casio Micronics (Yamanashi)

The use of wastes in eco-cement and the sorting and crushing of waste plastic to make it usable as blast furnace feedstock substantially reduced the amount of landfilled waste by the group, from 1,087 t in FY2000 to 269 t in FY2001.

Entire Group's landfilled wastes



Commendation Received from Director-General of Agency of Natural Resources and Energy

Kochi Casio received a commendation (electricity category) from the director-general of the Agency of Natural Resources and Energy as a plant with superior energy management. The plant was applauded for its efforts for energy conservation and management, and for the energy efficiency of its newly built 3rd Plant.



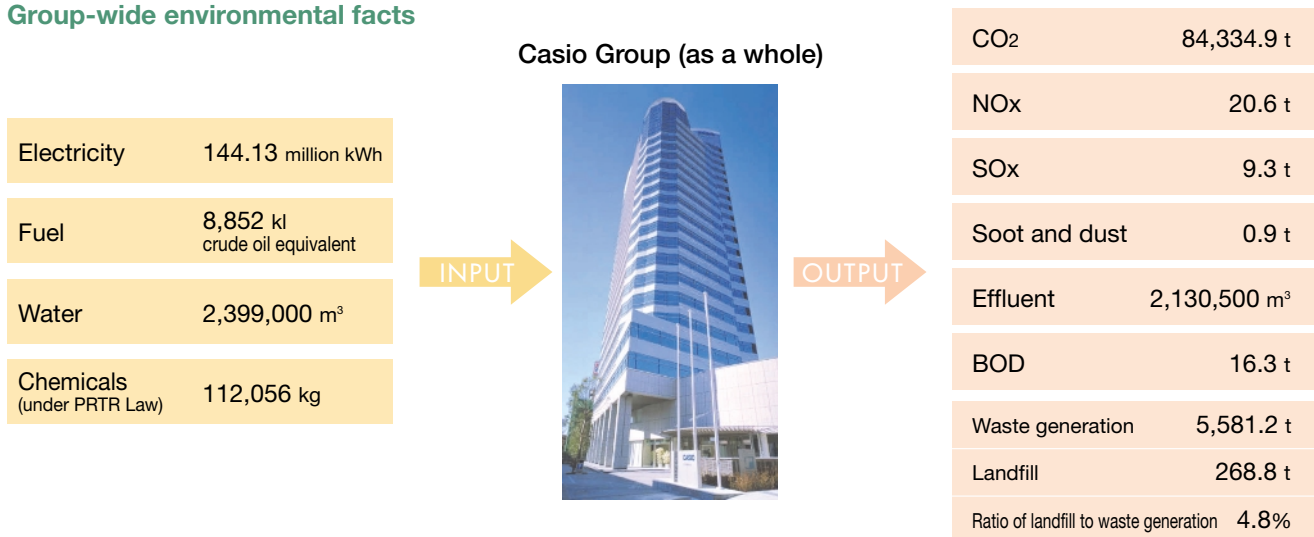
CO₂ emissions per unit manufactured

FY2001 group-wide CO₂ emissions per unit manufactured rose from 0.423 t CO₂/¥1 million to 0.504 t CO₂/¥1 million. The cause was trial operation and adjustments at Casio Micronics (Yamanashi facility) and facility enlargement at Kochi Casio. Once production reaches the planned level, emission per unit manufactured is expected to drop below the 1990 level.

Please see this Web page for details on environmental performance.

URL : <http://www.casio.co.jp/env/activity/performance.html>

Group-wide environmental facts



Glossary

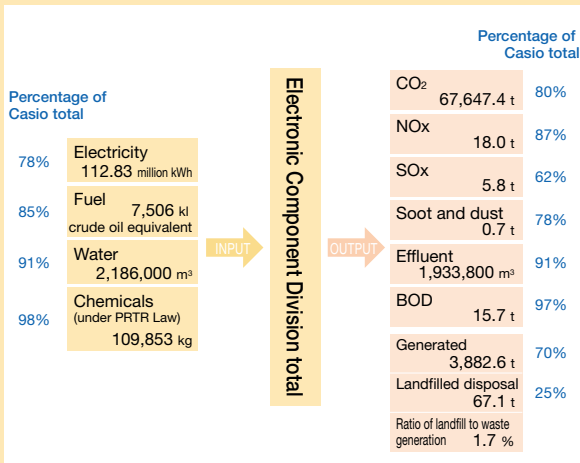
Zero emissions

If the annual amount of wastes given final disposal divided by the amount of wastes generated in that same

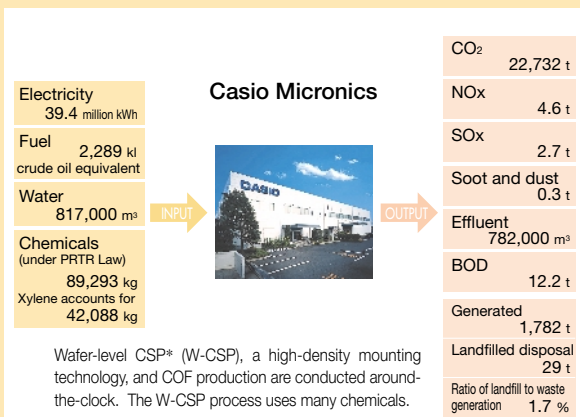
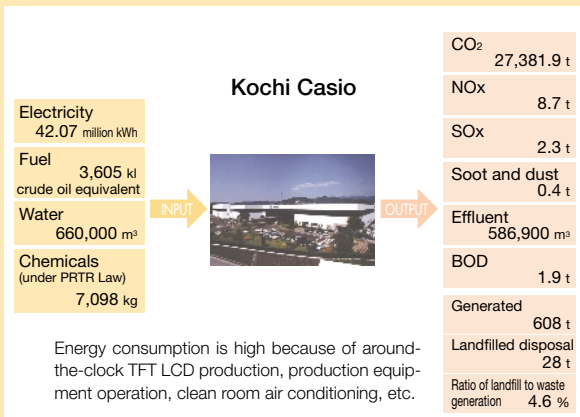
year yields a value of under 1%, the unit generating the wastes is considered to have achieved zero emissions.

Casio's business can be broadly categorized into an Electronic Component Division and an Electronics Equipment Division.

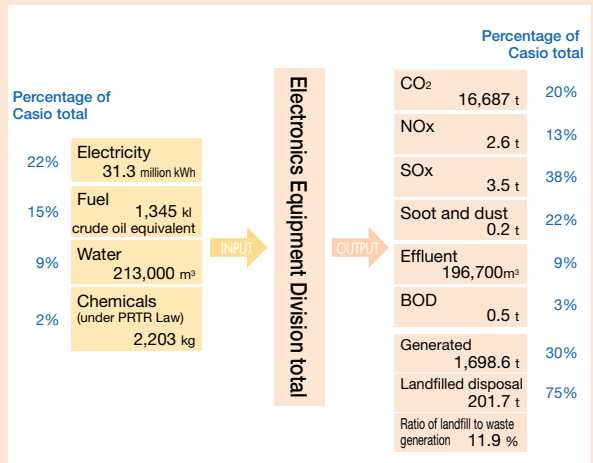
Electronic Component Division



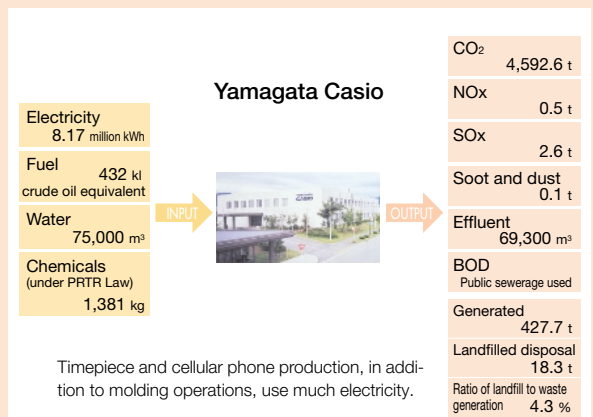
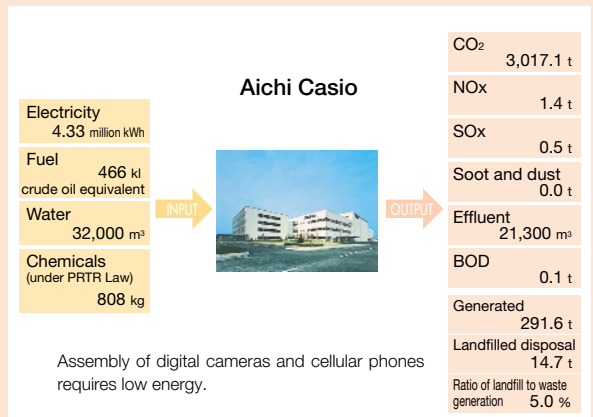
Data for Kochi Casio and Casio Micronics are presented below as typical examples of the Electronic Component Division.



Electronics Equipment Division



Data for Aichi Casio and Yamagata Casio are presented below as typical examples of the Electronics Equipment Division.



Glossary

Wafer-level CSP

Wafer-level CSP is an advanced technology making it possible, as an LSI packaging process, for copper

rewiring and formation of terminals to be performed with resin sealing in the wafer form.

Environmental Conservation Awards and Activities in Recent Years

Environmental Conservation Awards

Year	Month	Facility	Award/commendation name	Awarding body
1999	Feb	Casio Head Office	Outstanding Energy Management Facility Award from the Kanto Region Electricity Usage Rationalization Committee	Kanto Region Electricity Usage Rationalization Committee
2000	Feb	Hamura Research & Development Center	Best Energy Management Facility Award from the Kanto Region Electricity Usage Rationalization Committee	Kanto Region Electricity Usage Rationalization Committee
2000	Nov	Tokyo Product Control and Technical Center	Award for Distinguished Service by Hazardous Materials Handling Personnel	Tokyo Metropolitan Fire Department, Director of Fire Prevention Division
2001	Feb		Award for Excellence in Activities to Reduce Electricity Use	Kanto Region Electricity Usage Rationalization Committee
2002	Jan	Kochi Casio Co., Ltd.	2001 Award for Factory Energy Management Excellence (Electricity Division) Agency of Natural Resources and Energy Director-General's Commendation	Ministry of Economy, Trade and Industry, Agency of Natural Resources and Energy
2002	Feb	Hamura Research & Development Center	2001 Incentive Prize for Reducing Electricity Use	Tama Area Electricity Usage Rationalization Committee

Environmental Activities in Recent Years

Year	Month	Casio Group Environmental Conservation Activities	Other events
1999	Jun	Establishment of Casio Group's Environmental Action Plan "Clean & Green 21" Initiative	<ul style="list-style-type: none"> • Law Concerning Special Measures Against Dioxins enacted • Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management enacted
	Sep	Establishment of Green Procurement Guideline	
		Revision of Casio Voluntary Plan for the Environment (5th Edition)	
	Oct	Initiation of recovery of tape cartridges from corporate-users of electronic stationery label printer	
	Dec	Publication of Environmental Report 1999 Exhibit at Eco-Products 1999	
2000	Mar	Completed acquiring ISO 14001 certification of all domestic manufacturing facilities	<ul style="list-style-type: none"> • Basic Law for Establishing a Recycling-Based Society enacted • Waste Management and Public Cleansing Law amended • Law for the Promotion of Utilization of Recyclable Resources enacted
	Apr	Introduction of environmental accounting	
	Jun	Initiation of the full-scale recovery of printer drum and toner sets	
	Aug	Publication of Environmental Report 2000	
	Nov	Publication of "Green Procurement Standard Manual" for suppliers Revision of CVPE (6th Edition)	
	Dec	Completed acquiring ISO 14001 certification at four Casio Computer facilities Exhibit at Eco-Products 2000	
2001	Jun	Casio Group Environmental Action Plan "Clean & Green 21 Initiative" revised Implementation of Casio Green Products 30 (C.G.P. 30) Documents discarded by Hamura R&D Center start being recycled into watch product boxes	<ul style="list-style-type: none"> • Law for Recycling of specified Kinds of Home Appliances becoming effective • Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities becoming effective • Law Concerning Special Measure against PCB Waste enacted
	Aug	Publication of Environmental Report 2001	
	Sep	Joined JBRC, and began recycling secondary batteries (rechargeable batteries)	
	Dec	Acquirement of ISO 14001 certification at Casio (Taiwan) and Casio Soft Exhibit at Eco-Products 2001	
	Feb	Launch of program to recover and recycle used PCs and information/communications equipment from corporate users Acquirement of ISO 14001 certification at Casio Electronics (Shenzhen)	
2002	Mar	<ul style="list-style-type: none"> • Kofu Casio (Head Office) • Kofu Casio (Ichinomiya) • Casio Micronics (Yamanashi) Achievement of zero emissions at the three facilities:	<ul style="list-style-type: none"> • Construction Materials Recycling Act becoming effective • Kyoto Protocol ratified • Soil Contamination Control Law enacted
	Apr	Discontinuance of use of CFC substitutes at the entire Casio Group Acquirement of ISO 14001 certification at Casio Electronics (Zhongshan)	
	May	Acquirement of ISO 14001 certification at Casio Techno Head Office	
	Jun	Initiation of recovery of tape cartridges from consumers of electronic stationery label printer	
		Revision of Casio Group Environmental Action Plan "Clean & Green 21" Initiative	

Expanded Activities to Benefit Society

Financial Support for the Dolphin, Whale and Human Fund

Casio supports the Dolphin, Whale and Human Fund of the International Cetacean Education & Research Centre Japan (I.C.E.R.C Japan). This fund supports education and research efforts by cetacean researchers throughout the world, and provides information about those efforts to people in Japan interested in dolphins and whales. During FY2001 five research organizations in Japan and other countries

received support. On June 11 at the Casio Head Office building in Hatsudai we held a lecture and talk by one of the fund recipients, Dr. Kathleen Dudzinski, who is researching dolphin communication in the Bahamas. The event had 126 participants.

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I.C.E.R.C Japan homepage: <http://www.icerc.org/>



Lecture and talk by Dr. Kathleen Dudzinski



Mikura Island Bottle-nosed Dolphin Research Group watch model

Clean-Up Days

Casio strives to conserve the local environment by keeping the areas around factories clean. During FY2001 Clean-Ups were held at the Kofu Casio Head Office, Shirane Plant, and Ichinomiya Facility on July 19 (124 participating employees) and December 28 (137 participants).



Clean-Up participants in a forest near the Ichinomiya Facility of Kofu Casio on December 28.

Financial Assistance by the Casio Science Promotion Foundation

The Casio Science Promotion Foundation provides financial assistance to support pioneering and original scientific research. In FY2001 the foundation awarded a total of ¥49.8 million in 32 research projects in the

natural sciences and 5 in the humanities.

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<http://www.casio.co.jp/company/zaidan/>

Facilitating Environmental Communication

Casio Participates in Eco-Products Exhibit

Eco-Products is an exhibit that brings together eco-friendly products to encourage the building of a market for them. Casio has participated from the first exhibit. In this third exhibit, Casio displayed solar-powered and radio-controlled watches and other green products (see p. 10), and also described efforts including its personal computer and printer drum and toner set recovery program, which began full-scale operation in FY2001, and its environmental conservation system.



Casio's booth at Eco-Products 2001, held at Tokyo Big Sight in December 2001.

Environmental Reports

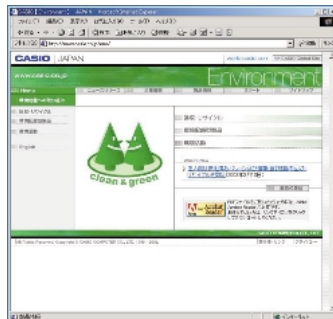
Casio began preparing environmental reports in 1999. Our website offers all the reports issued to date.

<http://www.casio.co.jp/env/activity/report.html>



Information Provided on the Web

We created a website that comprehensively describes and provides the latest information on Casio's environmental activities.



<http://www.casio.co.jp/env/>

House Organ Facilitates Environmental Communication

All Casio Group employees share information on environmental activities through the house organ.



Lectures on the Environment

Communicating Locally (FY2001)

Title		Date held	Venue	No. of participants/lecturer
Environmental Study Meeting "Clean Energy"		Feb. 2, 2001	Kofu Casio Head Office Facility	73 people (67 non-Casio) <i>Yuki Nara</i> , Edogawa Representative for Citizens Network to Consider Global Warming in Daily Life
Environmental Lectures	"What Is the PRTR?"	Jul. 6, 2001	Kofu Casio Head Office Facility	38 people Yamanashi Pharmaceutical Association <i>Mikio Kobayashi</i> , Environmental Sanitation and Testing Center Director
	"Safe Food and the Environment: From Home to the Company, and from the Company to Home"	Dec. 18, 2001	Kofu Casio Head Office Facility	60 people (4 non-Casio) <i>Kimiko Ashizawa</i> , Yamanashi Eco- Network Chairperson
Environmental Class "Handmade Postcards from Milk Cartons"		Dec. 22, 2001	Kofu Casio Head Office Facility	15 people (6 non-Casio)



Participants made New Year's cards.



Casio employees and others contemplated global warming together.

Independent Message

We solicited the views of the International Cetacean Education & Research Centre Japan (I.C.E.R.C Japan), a partner of the international whale and dolphin research activities that Casio supports, about the Casio Group's environmental activities and this environmental report.

Since Casio manufactures products like wristwatches and digital cameras that are an intimate part of everyday life, it was with great interest that I read the report to see how the company is working on environmental conservation.

We are a private volunteer organization conducting research (for correct understanding) and education (to impart information in an easily understood way) to deepen understanding about cetaceans and nature. Here I should like to state our view from outside the company on the role that Casio plays in global environmental conservation and environmental education for consumers.

I still have a fresh memory of when, in 1998, we received a proposal that the watches (G-SHOCK, Baby-G) which support our programs be packed in paper made from 100% recycled milk cartons, and in this report I find that Casio is working on "closed systems" and "non-coated paper board". Since packaging is discarded once a person takes out the product, it serves as a good way to get consumers to think about the environment. I definitely want Casio to continue its efforts toward the use and recycling of materials with a low environmental burden. Casio might also consider printing an explanation about their recycling initiatives on the packaging itself, and using it as a "mini environmental report."

With its illustrations, graphs, and other visual aids, I think the report itself is quite accessible, but perhaps a bit more inventiveness is in order to accommodate the students and children of the generations following us. For example, "Eco-friendly calculator" using lead-free

solder are cited as a typical example of "Green Products" that have undergone rigorous product assessments, but it would be a big help

to consumers when choosing products from an environmental perspective if there were an easy explanation of why using lead is not environmentally sound. Also, the recovery and recycling of personal computers and other products, now in full-scale operation, should cover more products, and be expanded to cover consumer products instead of just those used by businesses.

Credit-card-sized LCD digital camera recently put on sale is the focus of attention for its size and performance, and in fact this camera too meets the criteria for a "Green Product." I'm hoping that new products appearing from now on -- including successful fuel cells, which the report tells us is the next effort -- will be products that amaze us not only with their technology and sense, but also their eco-friendliness. I have hopes that Casio will continue its unrelenting efforts toward carrying out the environmental action plan and its broad initiatives for the environment.

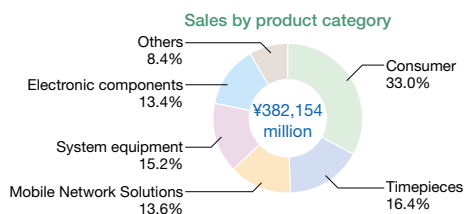


Views were exchanged at a meeting before this message was penned.

Hidekazu Oshita, Representative
International Cetacean Education & Research Centre Japan

Corporate Data (as of March 31, 2002)

Registered name: Casio Computer Co., Ltd.
Established: June 1, 1957
Head Office: 6-2, Hon-machi 1-chome, Shibuya-ku, Tokyo 151-8543, Japan
President: Kazuo Kashio
Paid-in Capital: ¥41,549 million
Net sales: ¥382,154 million (consolidated)



Main lines of business: **Consumer:** Electronic calculators, electronic stationery, electronic dictionaries, LCD TVs, visual-related products, digital cameras, electronic musical instruments
Timepieces: Digital watches, analog watches, clocks
Mobile Network Solutions (MNS): Mobile PCs, cellular phones, pocket computers, handheld terminals
System equipment: Electronic cash registers/POS terminals, office computers, page printers
Electronic components: LCDs, Bump processing assignments, TCP assembly and processing
Others: Factory automation equipment, molds, toys
Number of employees: 3,408 (non-consolidated), 14,670 (consolidated)
Consolidated companies: 63 subsidiaries (domestic and overseas)
 8 equity-method companies (domestic and overseas)

Casio Group Consolidated Financial Highlights Profile

	FY1997	FY1998	FY1999	FY2000	FY2001
Net Sales	502,012	451,141	410,338	443,930	382,154
Domestic	268,202	245,180	231,181	269,536	222,684
Overseas	233,810	205,961	179,157	174,394	159,470
Operating income	37,757	12,551	19,477	17,905	- 10,418
Total assets	537,013	506,566	507,105	445,883	449,224
Shareholders' equity	182,657	170,721	169,634	162,375	134,317
Capital investment	53,824	31,212	35,546	30,278	15,737
Employees	18,668	17,269	19,325	18,119	14,670



This logo symbolizes all the environmental activities that the Casio Group must work on together for the 21st-century global environment.

Contact Information:

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Published in August 2002.