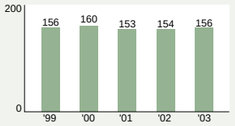
Overview of Environmental Strategy and Environmental Impacts

Clarification of material flow is important for analyzing the relationship between the environment and a company and to promote protection of the global ecosystem and biodiversity. As Toshiba Group's products and services range from home appliances and information and communications equipment to semiconductor devices, electronic components and heavy electrical apparatus and their environmental impacts vary, this section provides an overview of the environmental impacts of Toshiba Group. These environmental impacts are utilized as indices for verifying sustainability.

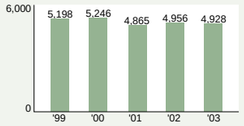
Environmental Impacts on the Global Ecosystem

Energy Calculated in CO_2 (ten thousand t-CO_2)



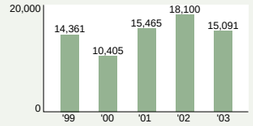
(Scope of data: ④)

Water (ten thousand m^3)



(Scope of data: ④)

Chemical substances Amount used (t)



(Scope of data from 2001: ③)

Energy: Electricity, heavy oil, kerosene, LPG, city gas, steam
Water: City water, industrial water, groundwater

INPUT

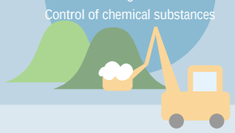
Environmental Management P36-39

Environmental audits | Environmental management | Disclosure | Environmental protection system
Environmental accounting | Voluntary environmental plan | Basic policy for environmental protection | Environmental education

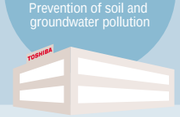
Business Activities

R&D and Design P42-49,P58
Environmentally conscious products
Environmentally conscious technology

Procurement P48-49,P52-53
Green procurement
Environmental measures for logistics
Control of chemical substances



Manufacturing P50-51,P54-55
Prevention of global warming
Zero emission
Prevention of soil and groundwater pollution



Logistics P49
Environmental measures for logistics

Sales

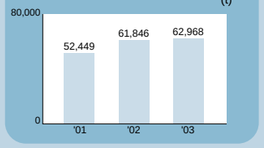
Customers P40-41,P42-49
Environmental accounting
Transparent production and investment
Environmentally conscious products

Collection of four products covered by the Home Appliance Recycling Law in Japan

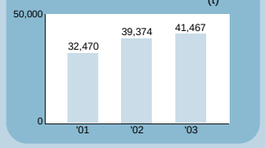
Recycling P56-57
Recycling of end-of-use products

Utilization of resouces outside Toshiba

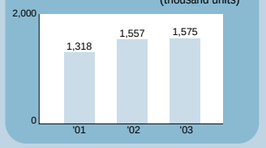
Weight of items processed (t)



Weight of items recycled (t)



Number of items processed (thousand units)

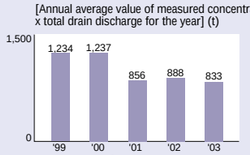


∗Data on four products (refrigerators, washing machines, televisions and air conditioners) covered by the Home Appliance Recycling Law in Japan

OUTPUT

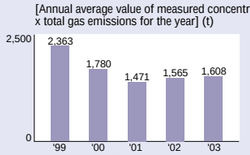
Environmental Impacts on the Global Ecosystem

Environmental impacts on water* [Annual average value of measured concentration x total drain discharge for the year] (t)



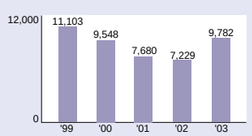
(Scope of data: ④)

Environmental impacts on air* [Annual average value of measured concentration x total gas emissions for the year] (t)



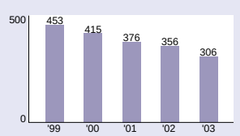
(Scope of data: ④)

Final disposal of waste (t)



(Scope of data: ④)

Chemical substances [Emissions to the environment] (t)



(Scope of data from 2001: ③)

- Environmental impact data are aggregated results of Toshiba Corp. and its 89 subsidiaries and affiliates (63 in Japan and 26 overseas).
- Data on chemical substances are data for substances subject to PRTR. Data for fiscal 1999 is for Toshiba Corp. on a non-consolidated basis for 179 types of substances, data for fiscal 2000 is for Toshiba Corp. and four group companies (Toshiba TEC Corp., Toshiba Lighting & Technology Corp., Toshiba Carrier Corp., Toshiba Elevator and Building Systems Corp.,) for 354 types of substances, and data for fiscal 2001 onward are for Toshiba Corp. and its 63 subsidiaries and affiliates in Japan.
- Environmental impacts on water are calculated as follows: annual average value of the measured concentration of a substance at the drain mouth multiplied by total drain discharge for the year.
  In the case that measured concentration is less than the lower detection limit, 1/2 of the lower detection limit is used as concentration for calculation.
- The increase in final disposal of waste in fiscal 2003 reflects starting of operation of new factories overseas.

∗Environmental impacts on water: Biochemical oxygen demand, suspensoid, N-hexane extracted substances, zinc, dissolving iron, general chromium, fluorine, total nitrogen, total phosphorous, nickel, lead, arsenic, hexavalent chromium
∗Environmental impacts on air: Particles of soot, nitrogen oxide, sulfur oxide

Gathering and Analysis of Material Flow Data

The figures show 5-year trends of inputs of energy, water and chemical substances, and of outputs, such as environmental impacts on water and air and discharge of waste. Toshiba intends to expand collection of data that can be utilized for efforts to reduce the environmental impacts of its activities. These data are significant components of indices of environmental protection benefits in the environmental accounting of Toshiba Group.

Environmental Management

Since the Earth's environment with its biodiversity is humankind's life-support system, issues associated with it are intimately involved with the very foundation of our existence. The orientation of society and the economy toward mass production, mass consumption and mass disposal needs to be tempered by adherence to other values. Mindful of our responsibility to future generations, we are making a concerted corporate-wide effort to utilize resources with the utmost efficiency. As an enterprise committed to sustainable development, Toshiba is resolved to raise consciousness as well as innovate technology.

Environmental Management

■Environmental Protection System

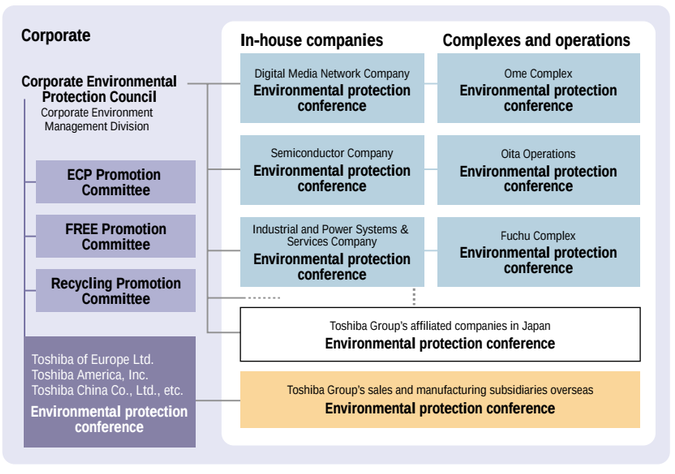
With the aim of enhancing the commitment to environmental protection throughout Toshiba Group and making it integral to the operation of every Toshiba Group company, Toshiba set up the Corporate Environmental Protection Council in 1991. Chaired by an executive officer responsible for environmental protection throughout Toshiba, the council has a wide-ranging brief: it proposes solutions to environmental problems affecting management, technological development, production and sales, determines basic policies, and reviews the progress of in-house companies and operations.

Its subordinate organizations include the Environmentally Conscious Products (ECP) Promotion Committee, which promotes development of environmentally conscious products and technologies, the FREE Promotion Committee, which promotes environmental protection at operations, and the Recycling Promotion Committee. Individual in-house companies and operations hold environmental protection conferences at which goals are set and projects launched for specific products and regions.

■Basic Policy for Environmental Protection

(1) Toshiba considers environmental protection to be one of management's primary responsibilities.
(2) Toshiba specifies objectives and targets for its business activities, products and services with respect to the reduction of environmental impacts and prevention of pollution.
(3) Toshiba strives to continuously improve the environment through vigorous implementation of environmental measures.
(4) Toshiba contributes to society through its environmental protection activities, which include the development and supply of excellent, environmentally conscious technologies and products and cooperation with the local community.
(5) Toshiba complies with all laws and regulations, industry guidelines which it has endorsed, and its own standards for environmental protection.
(6) Toshiba recognizes that natural resources are finite and promotes their efficient utilization.
(7) Toshiba strives to enhance the awareness of all its employees with respect to the environment and requires that they make a practical contribution to environmental protection through their work.
(8) Toshiba operates globally, and accordingly, promotes environmental activities throughout Toshiba Group.

■Organizational chart of the corporate environmental protection system



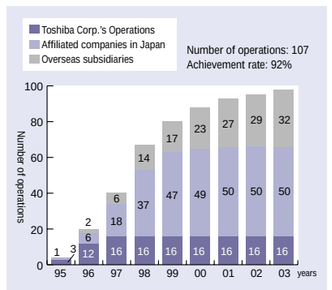
Environmental Management System

Toshiba considers ISO-14001 certification to be a passport to inclusion in the ranks of the world's most environmentally responsible enterprises.

As shown below, by September 1997 all 16 of Toshiba Corp.'s operations had gained ISO-14001 certification and have maintained that certification ever since. Of the 57 operations of affiliated companies in Japan, 50 operations have gained ISO-14001 certification. Of the 34 operations of Toshiba's overseas subsidiaries, 32 operations have gained certification and we are working to achieve certification for all our overseas facilities.

Internal auditing of environmental management systems covers all requirements of ISO 14001 in addition to items required for internal auditing and evaluates qualitative improvements compared with the previous year.

■ISO 14001 Certification




Corporate Environmental Protection Council

EASTER

In accordance with Toshiba's audit system called EASTER (Environmental Audit System in Toshiba on the basis of ECO Responsibility), annual audits of operations of Toshiba Corp. and those of subsidiaries and affiliates have been conducted since 1993. As well as improvement of the quality of environmental protection technology throughout Toshiba Group, another objective of internal audits is the enhancement of auditors' skills. Audits are performed by a group consisting of a chief auditor and auditors who are qualified in accordance with Toshiba's internal standards for auditors.

Environmental Education

In order to maintain and enhance the level of environmental protection, all Toshiba personnel receive environmental education according to their positions and the tasks in which they are engaged. The curriculum consists of education programs according to position, general environmental education, specialty education and ISO 14001 education.

For corporate-wide general education, e-learning is utilized to eliminate travel time and improve the participation rate. Programs for managerial personnel include a course designed to cultivate environmental awareness. On that course, in addition to gaining knowledge of a more general nature, participants disassemble personal computers so that they recognize the importance of environmentally conscious products.

Specialty education programs consist of ECP education and internal auditor education. The objective of ECP education is to ensure that engineers engaged in development and design fully understand the concept of environmentally conscious product (ECP) design.

Toshiba intends to continue provision of environmental education for all employees, and enhance content of education, enrich ECP education and expand IT-based education.


Auditing a workplace

■Environmental Education System Chart

Education according to position	General environmental education	Specialty education: ECP education	Specialty education: Education for internal auditors	ISO 14001 education
Education for managerial personnel	Environmental awareness cultivation course (e-learning (corporate general education))	Introduction to environmentally conscious design; Practical implementation of environmentally conscious design for recyclability	Internal auditor certification education •Workplace and system auditor •Technical auditor	General environmental education (all employees at operations); Education for fostering of internal auditors; Education for specific employees
Education for non-managerial personnel				
Education for new employees	Environmental education for new employees			

Voluntary Action Plan (Voluntary Environmental Plan)

Following the announcement of its first voluntary plan in March 1993, Toshiba achieved the seven initial targets by the end of fiscal 1995 as planned.

The second voluntary environmental plan was launched in fiscal 1996 and 10 of the 12 targets were achieved by the end of fiscal 2000, the final year of the plan.

Toshiba's third voluntary environmental plan, covering the period from fiscal 2001 to 2005, is now being implemented. This new voluntary plan is being promoted throughout Toshiba Group, including affiliated companies.

Zero Emission of Waste

Following 0.8% in fiscal 2002, the total quantity of waste for final disposal was equivalent to 0.7% of the total quantity of waste discharged, and so Toshiba achieved zero emission for the second consecutive year. Total discharge was 7% lower compared with fiscal 2002.

In fiscal 2003 Fuchu Complex, Kitakyushu Operations and Yokohama Complex achieved zero emission, bringing the total number of Toshiba operations that have achieved zero emission to 17 out of 19 operations.

Reduction in Release of Chemical Substances

In fiscal 2003 release of chemical substances was reduced by 42% compared with fiscal 2002. The shift from organic solvent-based paint to water-soluble paint, changes to processes and installation of equipment for recovery and removal are having decisive impacts.

In addition to these measures, Toshiba is working to ensure compliance with the industry's voluntary action plan concerning greenhouse gases.

Reduction in CO_2 Release

Although the ratio of CO_2 release to net sales decreased 10% in fiscal 2003 compared with fiscal 1990, the benchmark year, it deteriorated compared with fiscal 2002 because of the increase in the amount of CO_2 released by the semiconductor operations and other growth fields and due to the reshaping of the business. Toshiba intends to invest in energy-saving measures for clean rooms and to improve control with the aim of achieving the target.

Environmentally Conscious Products

The average green procurement ratio was 78% (4,310 suppliers out of 5,506 suppliers) in fiscal 2003.

Regarding provision of product information, 56.9% of the products on a monetary value basis are in compliance with the voluntary environmental standards.

Electricity consumed per product function was reduced by 46%.

Toshiba's target was to apply lead-free soldering to all products by fiscal 2003, but the actual achievement rate was 84% because lead-free soldering could not be applied to certain products for special applications and old models.

No new models introduced in 2004 contain HCFCs.

Third Voluntary Environmental Plan

		Items	Target	Result for fiscal 2003	Evaluation
1	Concerning operations	Zero emission of waste	The quantity of final disposal to be 1% or less of total discharge in fiscal 2003	0.8% in fiscal 2002 0.7% in fiscal 2003	○
2		Reduce release of chemical substances	30% reduction in fiscal 2005 compared with fiscal 2000	42% reduction compared with fiscal 2000	○
3		Reduce CO_2 release	25% reduction in fiscal 2010 compared with fiscal 1990	10% reduction compared with fiscal 1990 (6% increase compared with fiscal 2002. The amount of CO_2 released decreased by 153 kt compared with fiscal 1990.) The amount of CO_2 released by Toshiba Group in Japan increased by 267 kt compared with fiscal 1990.	△
4	Concerning products	Green procurement	100% of suppliers to be certified as green partners by fiscal 2005 (80% in 2003, 90% in 2004)	Green procurement ratio of 78%	△
5		Provide product information (Ratio of ECPs to net sales)	50% of products to be in compliance with the voluntary environmental standards by fiscal 2005	57% of products are in compliance with the voluntary environmental standards.	○
6		Reduce electricity consumed per product function	30% reduction in fiscal 2005 compared with fiscal 2000	46% reduction in power consumption of registered models	○
7		Apply lead-free soldering	Application of lead-free soldering to all products by fiscal 2003 (100%)	84% of products use lead-free soldering. Lead-free soldering is not applied to certain products for special applications and old models.	△
8		Abolish HCFCs	Abolition by December 2004	97% of refrigerators and 89% of air conditioners do not use HCFCs. No 2004 models use HCFCs.	○

Preserving Biodiversity at the Yokohama Complex

A view of the lagoon Camphor trees and camellias, planted by Toshiba, overlook The Lagoon; several varieties of grass flourish on its banks

With several bodies of water on its site, Toshiba's Yokohama Complex is well placed to pursue its project of monitoring the environment qualitatively and quantitatively. By recreating a wildlife habitat that was lost to industrial development, it is helping to preserve biodiversity.

Creating an Aquatic Environment

On its site Yokohama Complex has created several bodies of water collectively known as The Lagoon. When the original works was constructed on land reclaimed from the Negishi Bay, all the water was drained away—along with the wildlife. In 1980 a plan was formulated to use purified wastewater to create a wooded marsh environment teeming with wildlife. The idea was to restore an attractive, ecologically desirable environment providing a habitat for wildlife on the premises, while at the same time minimizing the factory's impact on water quality.

The Lagoon comprises seven bodies of water with a combined surface area of 5,500 square meters. The project sought to create and maintain an aquatic environment rich in biodiversity. Upstream from The Lagoon a rotary machine has been installed to produce a current and oxygenate the water, which is subjected to advance sewage treatment and further purified by the sun and microbial activity. Downstream, fences and banks have been constructed to provide a habitat for aquatic insects and birds.

Activities at The Lagoon

Besides day-to-day maintenance such as improvements to the fences and channels and clearance of undergrowth to allow certain species to flourish, The Lagoon is the scene of various thoroughly worthwhile activities—research into sustainable methods of using wooded marshland, environmental education including nature study and bird watching, and the construction of footpaths. The Lagoon is among the responsibilities of the environmental manager of Yokohama Complex. The state of water quality is constantly monitored online. A record is kept of the species of birds and their numbers every day, rain or shine.

Yokohama Complex encourages local elementary schools to make full use of The Lagoon as an outdoor classroom for interdisciplinary learning. Local residents also enjoy strolling along the footpaths, delighting in the wildlife.

The Lagoon teems with fauna. Indeed, colorful creatures such as dragonflies and spot-billed ducks breed there. Every spring several pairs of spot-billed ducks nest at The Lagoon. Flocks of tufted ducks and pochard winter there each year.

Children love the Lagoon The Lagoon serves as a wonderful outdoor classroom for local elementary school children

Using recycled industrial water to create a home for ducks and other wildlife is a fantastic idea. Thank you for the fascinating field trip. The machine for flattening drums was impressive and I greatly enjoyed doing the experiments.

Masatsugu Ueda,
5th grade, Sugita Elementary School

Outdoor panels depict bird species The habitat is closely monitored; the species of birds visiting The Lagoon and their numbers are recorded each day.

Woodland footpaths Footpaths composed of bedded wood chips have been constructed alongside the factory buildings.

Environmental Accounting

Toshiba introduced environmental accounting in fiscal 1999 in order to quantitatively grasp the costs and benefits of environmental protection and utilize the quantitative data as guidelines for business activities.

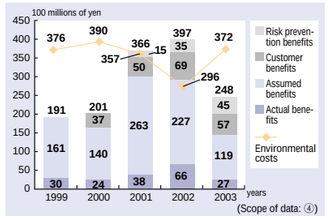
Basic Framework

Toshiba's environmental accounting for fiscal 2003 covers Toshiba Corp. and its 63 domestic subsidiaries and 26 overseas subsidiaries.

Classification of environmental costs and the calculation criteria are in accordance with the Environmental Accounting Guidelines issued by the Ministry of Environment, Japan. Regarding benefits, since no unified standards have been established, environmental impact reduction benefits are indicated quantitatively and also calculated in monetary value in Toshiba's environmental accounting. Environmental costs increased by 25% from fiscal 2002 to 37.2 billion yen due to higher business area costs as a result of the increase in the number of companies covered by environmental accounting. Meanwhile, environmental benefits decreased by some 40% from fiscal 2002 to 24.8 billion yen due to the increased environmental impacts resulting from opening of new factories overseas.

Regarding the five-year trend, environmental costs increased in fiscal 2003 partly due to the expansion of the boundary of environmental accounting. While customer benefits and risk prevention benefits are stable or on an upward trend, actual benefits and assumed benefits, which are in inverse proportion to production activities, are on a downward trend because the increase in environmental impacts exceeded the reduction benefits due to rising production. In order to ensure the accuracy and transparency of data, Toshiba has commissioned a third-party review of its environmental accounting by Shin Nihon Environmental Management and Quality Research Institute. (See Page 59)

■5-year Trend of Environmental Costs and Benefits



(Scope of data: ④)

■Environmental Costs

Millions of yen

Classification		Content	Expenditure		Costs		Change in costs from fiscal 2002	
Business area costs		Reduction of environmental impacts ①–③	7,920	(4,454)	21,343	(9,815)	7,102	(831)
Content	①Pollution prevention costs	Prevention of pollution of atmosphere, water, soil, etc.	5,833	(3,646)	12,899	(6,531)	5,003	(1,211)
Content	②Global environmental protection costs	Prevention of the greenhouse effect, protection of the ozone layer, etc.	1,210	(712)	2,302	(757)	333	(△481)
Content	③Resource circulation costs	Effective utilization of resources, reduction of volume of waste, etc.	877	(96)	6,142	(2,527)	1,766	(101)
Upstream/downstream costs		Green procurement, recycling, etc.	294	(17)	1,395	(208)	452	(17)
Administration costs		Environmental education, maintenance of EMS, planting of greenery at factories, etc.	400	(274)	5,235	(2,088)	△572	(△1,068)
R&D costs		Development of environmentally conscious products	517	(259)	8,338	(4,079)	542	(733)
Social activity costs		Support of environmental activities, contributions, etc.	0	0	163	(108)	146	(102)
Environmental remediation costs		Recovery from soil pollution, etc.	123	(121)	764	(700)	△ 23	(114)
Total			9,254	(5,125)	37,238	(16,998)	7,647	(729)

Total expenditure during the period	296,040	(168,430)
Total R&D expenditure during the period	336,714	(256,910)

Figures in parentheses are figures for Toshiba Corp. on a non-consolidated basis

∗**Actual benefits:** Total of the monetary value of the reductions of electricity charges, costs of waste disposal, etc. compared with the previous year and the proceeds from sale of items with value.

∗**Basis for calculation of assumed benefits:** Monetary values were calculated by giving each substance, calculated in terms of cadmium, a weighting based on environmental standards and ACGIH-TLV (allowable concentration of each substance as determined by the American Conference of Governmental Industrial Hygienists) and multiplying the result by the amount of compensation in the case of cadmium pollution. Reduction in environmental impacts on atmosphere, water and soil is indicated quantitatively and the environmental impact reduction volumes are compared with the previous year's results, and also reduction of environmental impacts is calculated in terms of monetary value to enable comparison of various environmental impacts on the same basis.

∗**Basis for calculation of customer benefits:** Benefits of reduction of environmental impacts of products throughout their life cycles are calculated in terms of physical quantity units and monetary units. A life cycle comprises several phases: 1) procurement of raw materials, 2) manufacturing, 3) transport, 4) use, 5) collection, 6) recycling and 7) appropriate processing. Toshiba's environmental accounting focuses on the benefits of reduction of environmental impacts at the use phase. Energy-saving benefits are calculated using the following formula:
Benefits (yen) = Σ [(power consumption per year of the former model – power consumption per year of the new model) x number of units sold per year x benchmark unit price of electricity charge]

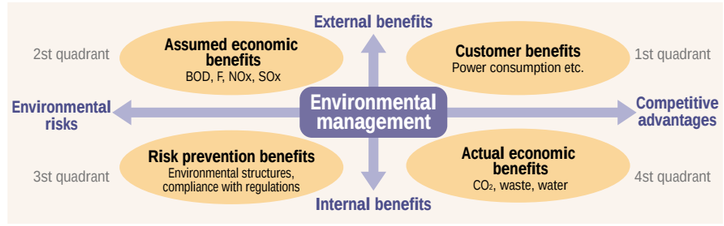
∗**Basis for calculation of risk prevention benefits:** Benefits of investment in environmental structures, such as dikes, for the purpose of preventing pollution of soil and groundwater are evaluated as benefits to prevent risks that might otherwise occur in the future. Risk prevention benefits for each capital investment item are calculated according to the following formula:
Risk prevention benefits = Quantity of chemical substances stored x Standard amount (monetary value) required for purification and restoration x Impact coefficient x Occurrence coefficient
where the standard amount required for purification and restoration and the occurrence coefficient are values unique to Toshiba. Risk of occurrence of leakage of chemical substances etc. is evaluated.

A Tool for Environmental Management

The figure indicates the outline of Toshiba's environmental accounting. Although Toshiba's environmental accounting initially concerned the second and the fourth quadrants, subsequently the first and third quadrants were included. Toshiba is working to establish a better approach so that measured benefits serve as appropriate indices for environmental management.

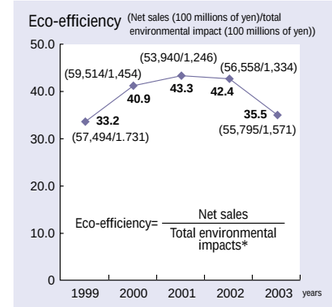
The graph at right indicates the trend of eco-efficiency, an environmental management index unique to Toshiba. Definition of eco-efficiency was revised from the previous year in order to achieve consistency with Factor T, an eco-efficiency concept for products. Eco-efficiency is a ratio of net sales to total environmental impacts. This index is useful for evaluating the benefits of routine environmental measures, provided that the content of the business does not change greatly. We are working to integrate the eco-efficiency index with Factor T for products throughout their lifecycles.

■Environmental Accounting as an Environmental Management Tool



Additionally, as a part of its efforts to strengthen internal control, Toshiba has started to introduce material flow cost accounting. A project for implementation of this accounting practice has been launched for the light bulb production process of Toshiba Lighting & Technology Corp., a subsidiary, following the project launched for the hard disk drive production line of Ome Complex in fiscal 2002. In both these projects, Toshiba is benefiting the guidance of Dr. Michiyasu Nakajima, professor of Kansai University, and Shin Nihon Environmental Management and Quality Research Institute. Based on findings obtained through these projects, we intend to expand the scope of implementation of material flow cost accounting.

■Eco-efficiency



∗Total environmental impacts are the total amount of environmental impacts on water and atmosphere calculated in monetary value in accordance with the method of calculating assumed benefits.

■Environmental benefits

Millions of yen

Classification	Contents	Toshiba	Affiliated companies	Total
Actual benefits	Benefits that can be directly converted into monetary value, such as reduced charges for electricity, water, etc.	1,552	1,178	2,730
Assumed benefits	Benefits concerning reduction in environmental impacts expressed in monetary value	7,709	4,249	11,958
Customer benefits	Reduction of environmental impacts at the usage phase expressed in monetary value	273	5,412	5,685
Risk prevention benefits	The extent to which risks are reduced after the investment compared with before the investment is calculated	1,828	2,633	4,461
Total		11,362	13,472	24,834

(1) Breakdown of actual benefits

Millions of yen

Item		Amount of reduction in environmental impacts	Monetary value of benefits
Energy	Toshiba Corp.	△107,140 GJ	645
	Affiliated companies	△800,034 GJ	△873
	Total	△907,174 GJ	△228
Waste	Toshiba Corp.	126 t	781
	Affiliated companies	△4,512 t	2,144
	Total	△4,386 t	2,925
Water	Toshiba Corp.	844,303 ㎥	125
	Affiliated companies	△576,699 ㎥	△92
	Total	267,604 ㎥	33
Total			2,730

∗Indicated in the above table are differences in volumes of environmental impacts between fiscal 2002 and fiscal 2003. Minus figures indicate that increase in environmental impacts exceeded reduction benefits due to increased production etc.

(2) Breakdown of assumed benefits

Millions of yen

Item		Amount of reduction in environmental impacts	Monetary value of benefits
Environmental impact reduction benefits at the manufacturing phase	Toshiba Corp.	38 t	7,709
	Affiliated companies	△26 t	4,249
	Total	12 t	11,958

∗Indicated in the above table are differences in volumes of environmental impacts between fiscal 2002 and fiscal 2003.

(3) Customer benefits

Millions of yen

Item		Amount of reduction in environmental impacts	Monetary value of benefits
Environmental impact reduction benefits at the usage phase	Toshiba Corp.	4,245 t–CO_2	273
	Affiliated companies	31,400 t–CO_2	5,412
	Total	35,645 t–CO_2	5,685

Environmental Considerations for Products

Growing concern about global warming, waste disposal and other environmental issues reflects heightened awareness of the vulnerability of the Earth's environment. Prompted by an earnest desire to hasten emergence of a recycling-based society, Toshiba Group strives to create environmentally conscious products (ECPs) with minimal environmental impacts throughout their lifecycles.

Factor T

Toshiba Group has introduced Factor T, its unique eco-efficiency indicator for evaluating functions and environmental aspects of a product. Eco-efficiency is calculated by dividing the "value" of a product by the product's "environmental impact". The smaller the environmental impact and the higher the value of the product, the greater is the eco-efficiency. The value of a product is calculated based on its functions and performance, taking the voice of customer into consideration. The environmental impact of a product is calculated, taking into consideration various environmental impacts throughout its lifecycle (from procurement of materials, manufacturing and distribution, through to consumption and disposal).

The factor is calculated by dividing the eco-efficiency of a product subject to assessment by the eco-efficiency of the benchmark product. The higher the eco-efficiency of the product, the larger the factor is. We refer to creation of environmentally conscious products (ECPs) through calculation of factors as "Factor T" and are widening its application.

■Definition of Eco-efficiency

$$\text{Eco-efficiency} = \frac{\text{Value of a product}}{\text{Environmental impact of a product}}$$

■Definition of Factor

$$\text{Factor} = \frac{\text{Eco-efficiency of a product subject to assessment}}{\text{Eco-efficiency of the benchmark product}}$$

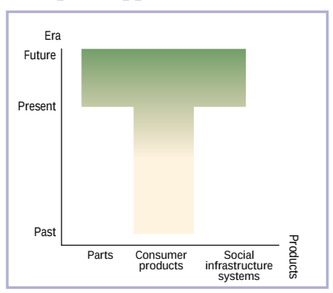
Application of Factor T and Calculation Examples

Toshiba Group has completed development of a method for quantitatively calculating eco-efficiency using Easy-LCA, a convenient environmental assessment tool, and LCPlanner (Lifecycle Planner), a tool for identifying desirable functions of a given product, in combination. Assessment of a product using Easy-LCA at every check point during the design phase facilitates development of ECPs. Based on the factor, which is an eco-efficiency ratio, relative evaluation of a product's environmental impact and value is executed and the results are reflected in product development.

Factor T is applied to a wide range of products including social infrastructure systems and medical equipment.

The graph below shows the trends of factors of 10 products and explanation is provided on Pages 44 to 46.

■Scope of Application of Factor T



■Factor Trends

■Eco-labeling

In 1999 Toshiba introduced Toshiba Group Earth Protection Mark as a part of its efforts to strengthen disclosure of products' environmental performances. Products in conformity with Toshiba's voluntary environmental standards, which cover such criteria as energy saving, no use of toxic substances, green procurement, design facilitating recycling, and recycling of end-of-life products, bear this mark.

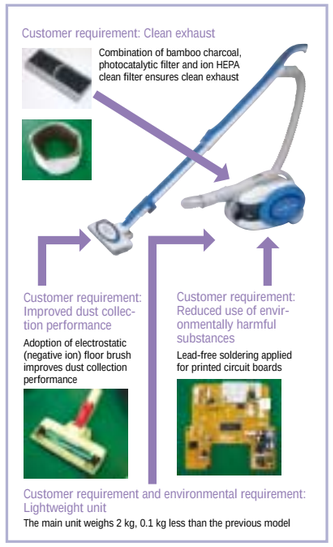
Toshiba Group Earth Protection Mark

Lifecycle Planning (LCP)

LCP is a technique for formulating a concept of an environmentally conscious product at the planning stage that satisfies the quality and cost requirements while at the same time decisively reducing environmental impacts throughout the lifecycle. Effective utilization of data obtained by lifecycle assessment (LCA) and quality function development (QFD) contributes to determination of environmental specifications, taking the product's lifecycle into consideration, and identification of ideas for improving maintainability and reusability at the parts level.

At present, we are using LCP in the planning of an environmentally conscious vacuum cleaner. From now on, we will expand application of LCP step by step to a wide range of products. Toshiba will continue development of practicable techniques for designing ECPs and apply them in product development.

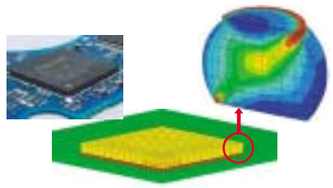
■Example of an Environmentally Conscious Design Concept Formulated by LCP (VC-P8X)



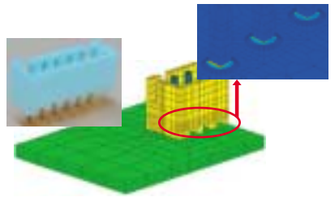
Use of Lead-free Soldering Throughout the Group

In accordance with the third voluntary plan, Toshiba Group is emphasizing use of lead-free soldering for printed circuit boards. Starting from selection of materials, taking their environmental impacts into consideration, we have performed various experiments to verify mounting, bonding reliability, fatigue life prediction, etc. and accumulated analytical results in databases. Our systematic approach to promotion of lead-free soldering includes preparation of a manual on application of lead-free, covering mass-production procedures, training, etc. These efforts have resulted in application of lead-free soldering for 84% of our products. We intend to apply lead-free soldering for industrial equipment for which a high degree of reliability is required.

■Life Prediction for Solder-bonded Portions



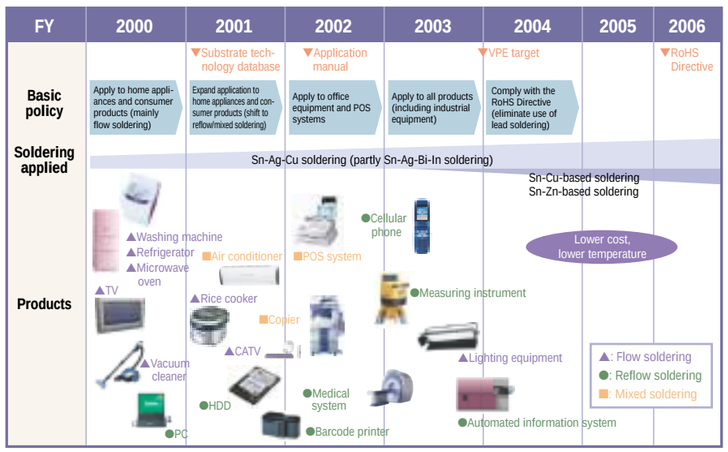
Flow soldering (BGA)



Reflow soldering (connector)

■Manuals and Databases

■Application of Lead-free Soldering to Products



Environmentally Conscious Products

Refrigerator “Non-Freon the Senzoko”

GR-NF415GX
Factor 8.6
(2004/1995)*

1) The lowest energy consumption in the industry

The winning combination of maximum capability to preserve the freshness of foods and minimum energy consumption defines the performance of an excellent refrigerator. Toshiba's new freon-free refrigerator, Non-Freon the Senzoko GR-NF415GX released in January 2004 combines high performance with the lowest power consumption in the industry—just 150 kWh/year.

The GR-NF415GX is Toshiba's first household refrigerator to incorporate a two-stage inverter compressor housing two compression mechanisms within a single compressor and a pulse motor valve (PMV) control system enabling two-stage cooling cycle for simultaneous cooling of refrigeration and freezer compartments.

2) Improvement in insulation performance

The GR-NF415GX is equipped with the twin plasma system for the cold air circulation routes for refrigeration and freezing, respectively. Also, the digital signal processor (DSP) controlled inverter has been optimized in relation to the two-stage cooling cycle. Further, adoption of vacuum insulation panels and optimization of the insulation thickness of parts resulted in higher insulation performance. The GR-NF415GX received the 2003 Award of the Director-General of the Agency for Natural Resources and Energy in Japan.

Washing Machine/Dryer “Ginga 21”

THE TOP IN DRUM TW-80TA
Factor 1.4 (2003/1993)

1) Decreased water consumption

The major environmental impact of washing machines is their high water consumption. In recent years, high hopes have been pinned on drum-type washing machines that use less water than the non-drum-type machines that have been the mainstream in Japan. Water consumption of the drum-type TW-80TA Toshiba introduced in March 2004 is the lowest** in the industry. With the newly developed disentangling hand-baffle, clothing entanglement during washing is reduced by 60%. Also, Toshiba's unique DSP control and DD motor reduce uneven distribution of laundry in the drum during spin-drying. Reduction in vibration and noise during spin-drying makes faster spin-drying possible. This has resulted in reduction in the amount of detergent remaining in laundry before rinsing. So although the TW-80TA executes rinsing twice, as opposed to three times for the previous model, the quality of the rinse is in no way compromised. The TW-80TA can wash 8 kg of laundry using only 79 liters of water, 11 liters less than the previous model.

2) Decreased use of environmentally harmful substances

Lead-free solder is used for printed circuit boards. Also, for the sliding door and other new structures environmentally friendly materials such as polypropylene are used.

Vacuum Cleaner “Aerocyclone Cleaner”

VC-R14C
Factor 1.9 (2003/1990)

1) Reducing waste by doing away with paper dust bags

By dispensing with paper dust bags, the VC-R14C vacuum cleaner produces less waste. What is more, it also saves energy thanks to its excellent cleaning performance. The New Aerocyclone System regulating the two types of inner airflow, direct flow and spiral flow, ensures that the compact VC-R14C achieves high dust collection performance without a great increase in energy consumption. Its maximum suction power of 560 W (an approx. 12% improvement on the previous model) is among the highest among cyclone-type vacuum cleaners. Also, wasteful power consumption is eliminated by the DSP-controlled Brushing Power Head, which detects floor conditions and adjusts the power output to the Power Head.

2) Reduction in the use of environmentally harmful substances

Because lead-free solder is used for the printed circuit board and chrome-free steel plate for the motor frame, the quantity of environmentally harmful heavy metals used is reduced.

Air Conditioner “Daiseikai”

RAS-285NDR
Factor 2.4 (2004/1993)

1) Remarkable energy saving

Air conditioners account for more than 20% of household electricity consumption in Japan. Energy-saving air conditioners are highly desirable also from the viewpoint of preventing global warming. The Daiseikai NDR series of air conditioners introduced in January 2004 received the 2003 Award of the Director-General of the Agency for Natural Resources and Energy in recognition of their excellent energy-saving performance. In modern houses, increased awareness of the importance of energy saving has led to better insulation and more airtight construction. As a result, a slight load due to heat generation in the unit may persist for a long period of time. To achieve energy saving, Toshiba has developed the Dual Stage Compressor that switches simultaneous operation of two compression cylinders to operation of a single cylinder when the load is low. Compared with the model introduced 11 years ago, energy consumption of the NDR series is halved in the case of conventional homes and reduced to a quarter in the case of well insulated homes. The coefficient of power (COP), an indicator for basic cooling performance is 127% (2.8 kW class) compared with the energy saving standard for fiscal 2004.

2) Reduced environmental impacts

As well as use of a CFC substitute and lead-free printed circuit boards, we strive to reduce waste materials through improvement of yield during manufacturing.

* Factor 8.6(2004/1995): This indicates that the eco-efficiency of the 2004 model is 8.6 times that of the 1995 model.
** As of February 3, 2004; among washing machines/driers and fully automatic washing machines; for washing 8 kg of laundry

Environmentally Conscious Products

Notebook PC “Satellite”

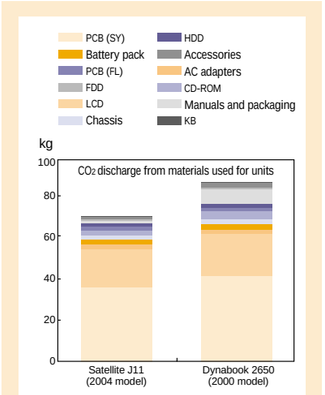
PSJ1122
Factor 2.6 (2004/2000)

Toshiba has reduced the power consumption of notebook PCs through a multifaceted approach, including adoption of Power Saving Utility to optimize energy-saving by Advanced Configuration and Power Interface (ACPI), Basic Input Output System (BIOS), hardware and software.

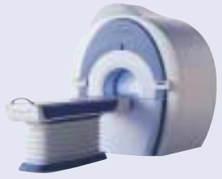
Because light weight and compactness have a direct bearing on resource saving, manuals are provided on CD-ROMs, thereby saving paper, and every effort is made to reduce the weight of the LCD and other units. To facilitate recycling, plastic components are labeled to indicate the material and recyclable plastics are used.

To prevent the emission of dioxins during incineration, multilayer printed circuit boards for the Satellite series contain neither halogen nor antimony. In addition, lead-free solder is used.

Reduction in environmental impacts



Medical System “Vantage” MRI System

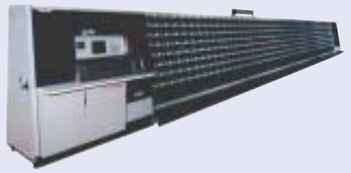


Factor 3.2
(2003/1997)

When placed within a magnetic field, hydrogen atoms in the human body exhibit a reaction known as magnetic resonance. Magnetic resonance imaging (MRI) systems convert this resonance into computerized images. Because cancer cells exhibit resonance different to that of cells in normal tissue, the degree of malignancy of a tumor can be diagnosed. With the development of a small-axis magnet and a corresponding stage, Toshiba has succeeded in reducing the weight of the system by 56%.

Also, power consumption has been reduced by 58% thanks to development of a high-speed imaging method and optimization of the design. In addition, resource saving is achieved through recycling of replacement parts, reduction in waste by extending the life of the system, and a 20% reduction in the volume of the fiber reinforced plastic (FRP) stage cover. At the same time, the Vantage is equipped with Toshiba's unique noise reduction system that cuts by 90% the noise an examinee experiences. Thanks to these attributes together with the open, short-axis, the Vantage is a thoroughly patient-friendly system.

Automation Systems



Mail Sorting System
Factor 1.6 (2004/2001)

Automated Ticket Gate
Factor 2.6 (2003/1998)

Bank Note Checker for Export
Factor 1.9 (2004/2000)

In automation systems, as for everything else, Toshiba has focused on developing systems with minimal environmental impact. Dissemination of best practice throughout Toshiba Group has resulted in the adoption of lead-free soldering and hexavalent chromium-free technologies for mail sorting systems, automatic ticket gates and other automated systems, thereby ensuring compliance with international environmental regulations, such as the RoHS Directive.

While enhancing system performance, both power consumption and weight have been reduced. For example, power consumption per function of an automated ticket gate has been reduced by 47% and weight per function has been reduced by 35%. Also Factor T, Toshiba's unique index for products' environmental impacts and values is utilized to reduce environmental impacts throughout product lifecycles.

Permanent Magnet (PM) Motors for Feed Pumps

Factor 3.8 (2003/1998)

Conventionally, induction motors have been used for feed-pump units for condominiums etc. In recent years however, permanent magnet (PM) motors have become an increasingly popular choice due to their environmentally friendly attributes, such as energy saving, high efficiency, compactness, and light weight.

Not only does a direct-feed booster pump using a Toshiba PM motor achieve a high rotating speed (6,000 rpm), but its direct-shaft design is smaller and more efficient than previous models. Use of aluminum die cast brackets and frame results in higher cooling power while also facilitating recycling. For example, Toshiba's 1.5kW motor weighs 65% less than Toshiba's conventional induction motor and its volume is 20% less. According to the lifecycle assessment, its CO_2 emission is one third of that of a conventional induction motor.

Toshiba PM motors are suitable for wind and hydraulic power systems and various other applications. These compact, lightweight motors save energy and improve efficiency.

Green Procurement

Green Procurement Guidelines Revised

As a key element of Toshiba's drive to create environmentally conscious products (ECPs), in cooperation with our suppliers we are promoting green procurement of products, parts and components, processed materials and raw materials that have less environmental impact.

Since April 2000, Toshiba has been conducting green procurement of parts and materials in accordance with the Green Procurement Guidelines established in December 1999. At present, Toshiba procures green items from some 5,000 suppliers.

Toshiba revised its Green Procurement Guidelines in June 2003 to accommodate the revisions to laws and regulations in Japan and issue of the RoHS Directive by the EU. This revision also reflected our stepped-up efforts to reduce environmental impacts in cooperation with our suppliers.

Evaluation and Selection of Suppliers Taking Green Procurement into Consideration

Suppliers are required to evaluate their environmental protection activities by completing forms provided by Toshiba. Priority is accorded to suppliers ranked high. In addition, upon request Toshiba's in-house specialists advise suppliers on how to raise their environmental performance. The results of suppliers' self-evaluation are improving with every passing year.

Environmental Performance Survey of Procurement Items

In cooperation with suppliers, Toshiba conducts an environmental performance survey of procurement items. Ratios of environment-related substances (environmentally harmful substances) and scarce resources to the weight of a procurement item are checked and Toshiba accords priority to items superior in terms of environmental impacts.

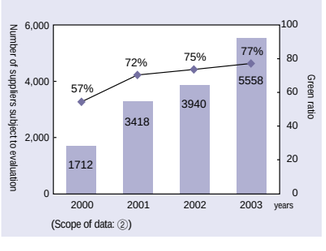
In the context of green procurement, environment-related substances are chemical substances contained in parts and materials to be incorporated in Toshiba products. Substances used only during manufacturing processes and unlikely to be contained in products are controlled separately. A database containing the results of the environmental performance survey is utilized for developing ECPs.

Issues to be Addressed

Toshiba, a member of the Japan Green Procurement Survey Standardization Initiative (JGPSSI)*, intends to promote compliance with the Green Procurement Survey Standardization Guidelines step by step. We expect introduction of the standardized guidelines will reduce the burden on suppliers and facilitate green procurement in the electronics industry.

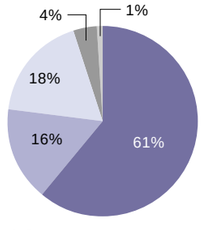
Improvement of Green Ratio

Green ratio = Number of suppliers in Rank S + Rank A / Total number of suppliers evaluated

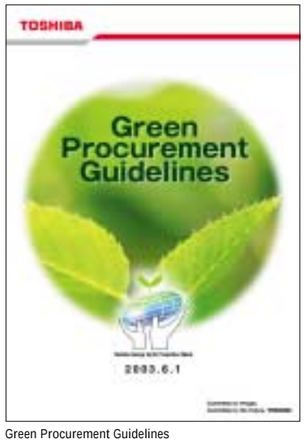


(Scope of data: ②)

Level of Suppliers' Environmental Protection Activities for Fiscal 2003



- **Rank S** (priority accorded for procurement: ISO 14001 certification gained or equivalent level)
- **Rank A** (priority accorded for procurement: Sufficient environmental protection activities are conducted.)
- **Rank B** (priority accorded for procurement: Environmental protection activities are conducted.)
- **Rank C** (Improvement required: Acceptance of guidance and support is a prerequisite for procurement)
- **Rank D** (Improvement required: Acceptance of guidance and support is a prerequisite for procurement)



Green Procurement Guidelines

*Japan Green Procurement Survey Standardization Initiative (JGPSSI): JGPSSI is a voluntary activity involving companies in the electronics and IT industries. Its purpose is to reduce the workload associated with green procurement surveys while enhancing the quality of responses through standardization of the list of items covered by the surveys and the response format.

Environmental Measures for Logistics

Reduction of Environmental Impacts of Transport and Distribution

Toshiba Group is working to reduce environmental impacts at every phase of the supply chain (flow of procurement, production and sales).

Major activities are described below.

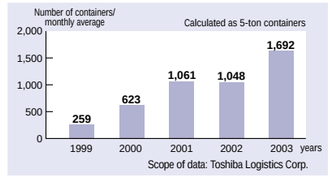
1) Reduction in CO_2 emission through expansion of modal shift.

2) Optimization of transport using trunk routes by means of integration and sharing of freight information; optimization of distribution to customers through establishment and expansion of a flexible vehicle assignment system attuned to the daily fluctuation of freight volumes

3) Reduction in the number of vans and trucks by optimizing the shipment of freight and utilization of vehicles among logistics subsidiaries of electronic/electrical companies (Reduction in the number of vehicles by joint transport of freight destined to the same area and by preventing long-distance transport vehicles from returning empty)

Modal shift is on the rise as shown in the figure below. Toshiba intends to widen use of rail transport, introduce low-pollution vehicles and expand application of the flexible vehicle assignment system.

Trend of Modal Shift (Conversion to Rail Transport)

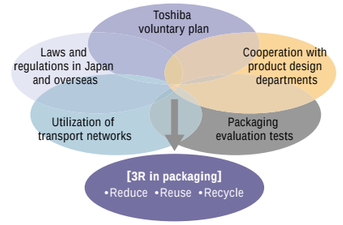


Scope of data: Toshiba Logistics Corp.

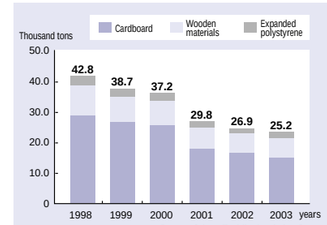
Environmentally Conscious Packaging

Toshiba Group is promoting 3R (reduce, reuse, recycle) in packaging and developing optimum packaging specifications that satisfy stringent conditions. As a result, the total volume of packaging materials used has been reduced by 40% in the last six years.

Basic Concept of Environmentally Conscious Packaging



Reduction in Discharged Packaging Materials



Scope of data: Toshiba Logistics Corp.

Development of Returnable Block Packaging for Super Heavy Goods Toshiba Wins METI Minister's Japan Star Award for Packaging

Conventional packaging for transporting heavy equipment such as a large generator is one-way skid packaging, requiring a lot of timber. Once used, the packaging is disposed of because most such equipment is unique in size and shape. As befits a friend of efficiency and an enemy of waste, Toshiba has developed reusable metal blocks.

Red lines in the figure indicate the conventional skid and the newly developed one. The blocks can be dismantled when not in use, as shown in the photo on the right, and they can be configured into the desired shape according to the product. An amount of timber equivalent to that needed to build 1.5 houses was previously used for each item of equipment transported. This translates into the saving of 100 tons of timber every year.

By virtue of its functionality and the great saving in timber it achieves, the block packaging received the Minister of Economy, Trade and Industry (METI) Award in the Packaging Contest of the Japan Packaging Institute.

Conventional packaging and newly developed block packaging


Conventional packaging | Block packaging | Dismantle blocks for storage

Reduction in the amount of waste timber

Q. How much timber is saved per item of equipment transported?

(house with a floor area of 100m²)

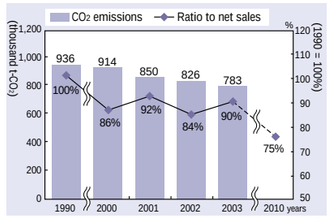
Prevention of Global Warming

Global warming, caused by increasing emissions of CO_2 and other greenhouse gases as a result of human activities, is an environmental issue of fundamental importance to our existence on the planet. The impact of global warming on the ecosystem is becoming apparent; temperatures increase, causing sea levels to rise, climate to change and disasters to occur. Toshiba is contributing to the prevention of global warming by providing energy-efficient products and systems and by acting decisively throughout its operations to save energy and reduce emissions of CO_2 and other greenhouse gases.

Targets and Results for Reduction of CO_2 Emissions at Operations

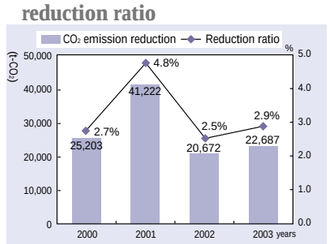
The target for reduction of CO_2 emissions at Toshiba Corp.'s factories and laboratories is a 25% improvement in the ratio of CO_2 emissions to net sales by fiscal 2010 compared with fiscal 1990. CO_2 emissions for fiscal 2003 were 5% lower than for the previous year; 16% lower than for fiscal 1990. The ratio of CO_2 emissions to net sales improved by 10% compared with fiscal 1990.

■CO_2 emission reduction targets and results



(Scope of data: ①)

■Reduction of CO_2 emissions and reduction ratio



(Scope of data: ①)

Energy-saving Measures

Toshiba is promoting energy saving from a medium- to long-term perspective. As well as pursuing greater efficiency, we are proactively disclosing our progress on the energy-saving front. Toshiba applies a threefold approach in a consistent, balanced manner as described below.

(1) Improvement in control

In order to ensure compliance with control standards and eliminate waste, Toshiba promotes reduction in energy consumption by improving production processes and efficiency.

■Semiconductor Company's PFC reduction targets and results

Targets	•Reduce emissions of PFC gas by the end of fiscal 2010 to 90% or less of emissions in fiscal 1995 (adoption of alternative substances and introduction of scrubbers) •Reduce emissions of liquid PFC by the end of fiscal 2010 to 30% or less of emissions in fiscal 1995 (adoption of alternative substances)

Results	PFC gas emissions		Liquid PFC emissions	
	Thousand ton-CO_2/year	Compared with fiscal 1995	Thousand ton-CO_2/year	Compared with fiscal 1995
Fiscal 2000	827	183%	152	85%
Fiscal 2001	617	136%	122	68%
Fiscal 2002	592	131%	80	45%
Fiscal 2003	604	133%	80	45%

■HFC reduction targets and results

Targets	Reduce use of HFC promoting use of substitutes Eliminate use of HCFC by 2004 (Use of HCFC for refrigerators ceased in 2003.)

Results	Refrigerators		Air conditioners	
	Emission (ton-CO_2/year)	Compared with fiscal 2000	Emission (ton-CO_2/year)	Compared with fiscal 2000
Fiscal 2000	529	100%	10,894	100%
Fiscal 2001	445	84%	1,348	12%
Fiscal 2002	356	67%	1,748	16%
Fiscal 2003	122	23%	1,607	15%

(Scope of data: ②)

(2) Investment in energy-saving equipment

Toshiba invests systematically in order to replace power facilities, production facilities, air-conditioning and lighting systems. Also, Toshiba is developing its energy service company (ESCO) business.

(3) Energy-saving clean rooms

Air conditioning systems for clean rooms consume a lot of energy. Energy saving is promoted by enhancing the efficiency of air conditioning through local cleaning, optimization of circulation airflow and adoption of more energy-efficient manufacturing processes.

These efforts reduced CO_2 emissions by 22,700 tons in fiscal 2003, an amount equivalent to 2.9% of Toshiba Corp.'s CO_2 emissions.

Commitment on Greenhouse Gases other than CO_2

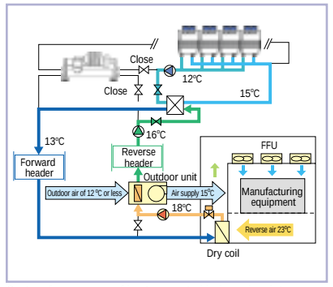
In the semiconductor manufacturing process, perfluorocarbons (PFCs) are used for cleaning chemical vapor deposition (CVD) equipment and dry etching. Toshiba is advancing toward attainment of its target (which corresponds to the target set by the World Semiconductor Council): emissions of PFC gases in 2010 amounting to less than 90% of the 1995 level.

As for hydrofluorocarbons (HFCs), used as refrigerant for air conditioners and refrigerators, and hydrochlorofluorocarbon (HCFCs), applied as heat insulating material, Toshiba is reducing their use in accordance with its voluntary targets.

Case Studies on Energy Saving and CO_2 Emission Reduction Measures

■New 300 mm Wafer Plant

For a new clean room for fabricating semiconductor devices on 300 mm wafers, Oita Operations has achieved energy saving equivalent to 640 kl of crude oil per year by optimizing circulation airflow based on measurement and analysis of the clean room's heat environment, recovery of the thermal load, and adoption of free cooling in winter. Also, high-efficiency turbo refrigerators have been adopted that use HFC134a, a refrigerant whose ozone-depleting potential is 0.



System for recovery of heat generated indoors in winter

■Toshiba Receives METI Minister's "2003 Excellent Energy Saving Case" Award

The increasing energy consumption associated with office buildings is becoming a concern. Toshiba headquarters building's energy consumption for air conditioning has been reduced thanks to the introduction of the Comfortable Air Conditioning Control System, a building energy management system (BEMS). For this achievement Toshiba won the Minister of Economy, Trade and Industry's Award for Excellent Energy Saving Cases in fiscal 2003. Implementation of BEMS for the building—to which inverter control of airflow volume, cooling with outside air, use of total heat exchangers and optimum start-up, and other energy-saving measures had already been applied—yielded further energy saving, while control of factors other than temperature, such as humidity changes and the impact of radiant heat due to incoming sunshine, is also automated. Compared with the three-year average before introduction of BEMS, energy expended on cooling water was reduced by 6,274 GJ or 12% and electricity consumption by 1,728 MWh or 6.8%, thereby reducing CO_2 emissions by 1,000 tons per year.

Development of New Energy Equipment

■Micro Wind-power Generation System

Toshiba Plant Systems & Services Corp. provides Wind Flower, a hybrid micro wind-power generation system combining wind-power generation, solar power and batteries. Wind Flower, which uses an efficient vertical-axis windmill, operates so quietly that it is suitable for installation even in urban areas. Following the 400W model, the line-up will be expanded.

400W Wind Flower EWF-400

Yuuichi Hanada
Building Energy Solutions Development Group
Building Systems Technology Department
Infrastructure Systems Division
Industrial and Power Systems & Services Company

■Developing the Comfortable Air Conditioning Control System

Temperature control of air conditioning is a headache for building facilities managers because they have to ensure comfort while at the same time saving energy. So we have developed a system that automatically fine-tunes temperature setting based on the degree of comfort of rooms, which is indexed using computers. By introducing the system at Toshiba headquarters building, we saved a great deal of energy. We also won a prestigious award. I hope people will recognize the significance of what we accomplished and apply the system in as many buildings as possible.

■Polymer Electrolyte Fuel Cells

Toshiba International Fuel Cells Corp. achieved the power generation efficiency of 38% at a rating of 700W and 30% at the minimum load of 250W in fiscal 2003 with its 1kW-class system for home use—the world's highest power generation efficiency in its class. The company is working to enhance reliability and reduce costs in preparation for commercialization.

1kW-class polymer electrolyte fuel cell for home use

Control of Chemical Substances

Chemical substances fulfill indispensable roles in contemporary industrialized society. However, safety concerns, notably those associated with heavy metals and endocrine disrupters, are on the rise. Mindful of humankind's responsibility to ensure that succeeding generations inherit a healthy environment, Toshiba is strengthening control of chemical substances and promoting technological innovation to hasten emergence of a recycling-based society.

Control of Chemical Substances

Although chemical substances are indispensable, they may cause serious pollution that harms human health and the environment if appropriate controls are not implemented or accidents occurs.

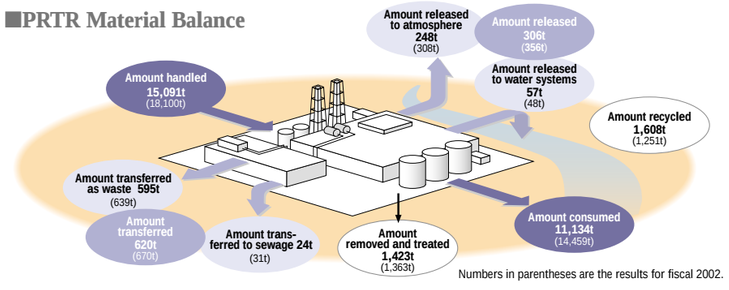
Toshiba's use of chemical substances is based on three fundamental policies: avoid use of toxic substances to the maximum extent possible, promote reduction and substitution to the maximum extent possible, and subject use to appropriate controls.

Toshiba Group's PRTR

Since April 1, 2002, reporting of the types of chemical substances released and their quantities has been mandatory in accordance with the Law Concerning Reporting etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (PRTR* Law). Since March 2003 a system has been established for disclosure of individual premises' results upon request from any member of the public.

Toshiba was among the first in the industry to disclose PRTR data when it published the data for fiscal 1997 in Toshiba Environmental Report 1998. Subsequently, in 2001 the scope of PRTR data was expanded to include the four subsidiaries, and in 2003 to include the subsidiaries and affiliates in Japan subject to Toshiba's environmental accounting. PRTR data for individual sites of Toshiba Group is available on the Toshiba website at http://www.toshiba.co.jp/env/en/data/. A comparison of the results for fiscal 2003 with those for fiscal 2002 reveals that the amount of chemical substances Toshiba handled decreased by 3,000 tons, primarily due to wider use of lead-free soldering. The amount released to the environment was reduced by 50 tons thanks to technical measures, such as substitution of water-soluble paints for organic solvent-based paints and the installation of scrubbers.

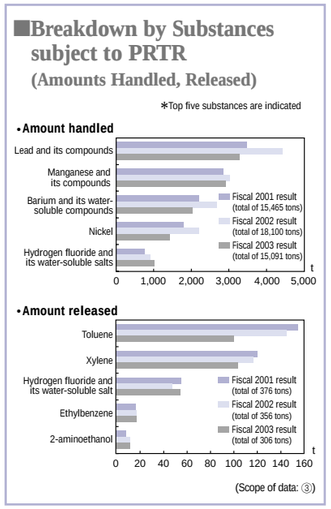
■PRTR Material Balance



Numbers in parentheses are the results for fiscal 2002.

*The scope of companies subject to PRTR was expanded from fiscal 2003. The comparison of the PRTR data for fiscal 2003 with the data published in the Environmental Report 2003 is available on the Toshiba website at http://www.toshiba.co.jp/env/en/data/ .
*The amount consumed includes the amount of the substance subject to PRTR that changed to other substances by reaction and the amount that left facilities in products or together with products.
*The amount removed and treated includes the amount of the substance subject to PRTR that changed to other substances due to incineration, neutralization, decomposition, reaction treatment, etc. within a facility.
*Landfill at operations (stable type, control type, and shield type) is categorized as release. Release to the public sewage system is categorized as transfer.
*The difference between transfer and recycling depends on whether a monetary transaction is involved or not. Therefore, even if the purpose is recycling, if treatment of the substance is contracted out to a third party with charge, the transaction is categorized as transfer of waste.

■Breakdown by Substances subject to PRTR (Amounts Handled, Released)



*PRTR data for other substances is available on the Toshiba website at http://www.toshiba.co.jp/env/en/data/ .

Ranking of Substances and Control Classification

Some 2,000 substances, including 354 substances covered by the PRTR Law, are classified into three ranks, A, B and C, based on the laws and regulations and the hazard. Control classifications (prohibition of use, reduction of release, control of use) for substances are determined based on the risk associated with the substance. Toshiba adopts a quasi-risk assessment approach in which the risk posed by a substance is expressed as the product of the hazard and the level of exposure.

Toshiba forbids purchase of any substance whose use is prohibited (41 substances). For substances whose use is subject to control, Toshiba is clarifying the amounts used. For substances whose release is to be reduced (24 substances including those whose release is high according to PRTR data), Toshiba's target set in its voluntary environmental plan is to achieve a 30% reduction in the amounts released in fiscal 2005 compared with fiscal 2000. The reduction plan and the amounts released by Toshiba Corp. and the spun-off companies are shown below. We expect to achieve the target earlier than scheduled thanks to use of substitute materials and process changes. We intend to revise the target, as necessary.

Disclosure and Risk Communication

Since companies are accountable to their stakeholders, the demand for disclosure of information is bound to increase. Toshiba is making every effort to disclose information in an appropriate manner, for example, by providing easy-to-understand explanations in the CSR Report and promoting interactive dialog with stakeholders.

PCB Storage and Control

Since 1972 when manufacturing of products using polychlorinated biphenyl (PCB) ceased in Japan, some 16 Toshiba operations in Japan have retained PCB and products containing PCB in storage under strict control. As of 2003, the products and items stored by Toshiba Corp., and major affiliated companies, include 240 transformers, 6,500 high-voltage capacitors, and about 200,000 low-voltage capacitors, amounting to some 360 tons of PCB. In addition to the prescribed storage rules, installation of dikes and double containers (receiver tanks) ensures safety.

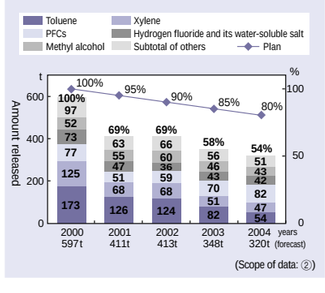
Recognizing that a definitive solution to the PCB problem would necessarily involve treating PCB and products containing PCB as soon as possible using reliable technology, Toshiba has set itself the goal of completing treatment of its entire stock of PCB stored in house by fiscal 2010. Toshiba's Ukishima Resource Recycling Center is conducting PCB detoxification, albeit on a small scale, using a photocatalytic decomposition method characterized by reaction conditions similar to those in a normal environment, use of readily available substances and no use of highly active substances.

Hideki Tanaka
Recycling Promotion Group
Planning and Administration Department
Industrial and Power Systems & Services Company

■Detoxification of PCB

Since September 2002 my co-workers and I have been running a PCB detoxification system. We've treated about 120 kg of PCB so far. I feel very good about being part of a team effort to solve the PCB problem as soon as possible.

■Reduction of Release of Substances Covered by the Voluntary Environmental Plan



■Substances Whose Release is to be Reduced (Substances Covered by the Voluntary Environmental Plan)

24 types listed below:

- Ammonia
- Isobutyl alcohol
- Ethylene glycol Monoethyl ether
- Xylene
- Styrene
- Toluene
- Formaldehyde
- Methyl alcohol
- Methyl isobutyl ketone
- Hydrogen chloride
- 2-ethoxyethyle acetate
- Ethyl acetate
- Sulfuric acid
- Hydrazine
- Phenol
- Bisphtalate (2-ethylhexyl)
- Hydrogen fluoride and its water-soluble salt
- Chlorine
- Inorganic cyanide compounds (except complex salts and cyanates)
- Hydrogen sulfide
- Sulfur hexafluoride
- PFCs
- HCFCs
- HFCs

Storage of PCB-containing products on a tray

Photocatalytic decomposition treatment system

*PRTR: Abbreviation of Pollutant Release and Transfer Register. This register enables reductions in environmental risks posed by chemical substances and environmental pollutants to be measured. Companies are required to report to the government how much waste they discharge on-site and how much they transfer off-site. PRTR is mandated by the Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (The Pollutant Release and Transfer Register Law).

Commitment to Zero Emissions

Industrialized society wedded to convenience and characterized by mass consumption and mass disposal has put enormous pressure on the environment, causing the destruction of natural habitats and depletion of resources. The zero emissions concept, first proposed by the United Nations University in 1994, is based on complete and efficient utilization of natural resources and minimization of the environmental impacts of human activities. To hasten emergence of a recycling-based society gentle on the global environment, Toshiba Group is promoting zero emissions.

Zero Emissions Achieved

According to Toshiba's definition, zero emissions is achieved when the quantity of waste for landfill after treatment is equivalent to 1% or less of the total quantity of by-products and other items generated (total amount of waste discharged) as a result of business activities. The rate of final disposal, which was 1.9% for fiscal 2000 when the voluntary environmental plan was launched, was reduced to below 1% for the first time in fiscal 2002. The rate was 0.7% for fiscal 2003, thus maintaining zero emissions. Toshiba is striving to maintain zero emissions for fiscal 2004.

Characteristics of Toshiba's Activities for Zero Emissions

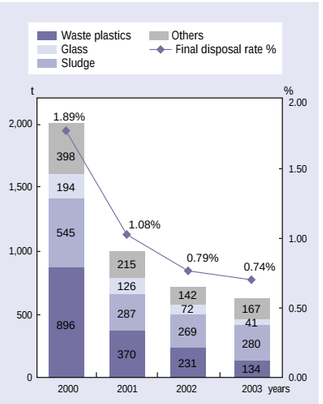
Given that Toshiba's product portfolio ranges widely, from semiconductors and other electronic devices to power systems and home appliances, many types of materials are used in production processes, and accordingly, the types of waste discharged also vary greatly. Moreover, because the recycling needs vary among operations, it has been necessary to optimize zero emissions activities attuned to the needs of individual operations. Therefore, while thorough disassembly and separation for discharge is the overreaching theme, individual operations are working to achieve zero emissions by promoting waste treatment in accordance with regional characteristics and cooperation with the steel, cement, chemical and other industries.

Moreover, in view of the recent transfer of businesses to affiliated companies and ongoing globalization, Toshiba is working to achieve zero emissions throughout its operations worldwide.

Activities From Now On

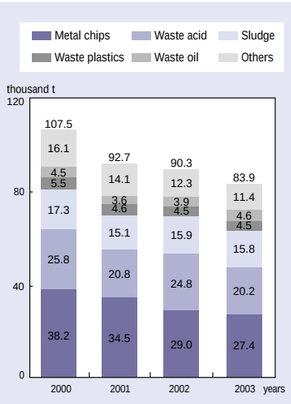
The total quantity of waste generated by Toshiba in fiscal 2003 amounted to 83,900 tons. We intend to reduce the quantity of waste generated while at the same time maintaining zero emissions. Also, we will promote development of recycling technologies and vigorously utilize recycled materials so as to help establish a recycling-based society. At the same time, we will work to minimize overall environmental impacts by reducing the amount of energy used for recycling and transport, for example.

■Quantity of Waste for Final Disposal and Final Disposal Rate



(Scope of data : 19 domestic operations at the time of establishment of the voluntary environmental plan in fiscal 2000)

■Total Amount of Waste Discharged



(Scope of data : 19 domestic operations at the time of establishment of the voluntary environmental plan in fiscal 2000)

Preventing Soil and Groundwater Pollution

As well as monitoring soil and groundwater pollution at factory sites and executing purification, Toshiba Group is implementing fail-safe measures for facilities to prevent pollution and reduce risk.

Measures for Pollution Caused by Volatile Organic Compounds

Toshiba Group is conducting purification and monitoring of pollution caused by volatile organic compounds at 15 sites. At these sites 422 pumping wells or gas suction wells are installed to recover and purify volatile organic compounds, and 168 observation wells are used to monitor trends of the concentration of pollutants in groundwater. 1,287 kg of compounds was recovered in fiscal 2003.

With the current purification technology, as the concentration of organochlorine compounds contained decreases due to purification, the recovery rate decreases. Toshiba is introducing advanced technologies to raise the efficiency of purification.

Preventing Recurrence of Pollution

Toshiba has guidelines for the following eight types of structural design: dikes and pans, exhaust gas scrubbers, waste storage sites, chemical storage sites, piping for liquid chemicals and effluents, waste water treatment facilities and in-site waste water systems, plating facilities, and oil storage facilities. By ensuring that structures are in conformity with these guidelines, pollution is prevented. As indicated in the radar chart showing the conformity, whereas Toshiba Corp.'s conformity ratios are high for all eight structural guidelines, Toshiba Group companies are lagging in terms of scrubbers, piping and oil storage facilities. We intend to focus our efforts on improvement in these three areas.

■Examples of Pollution Countermeasures

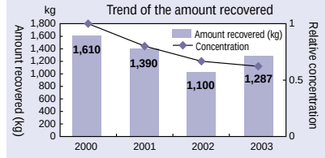
1) Site of the former Yokohama Operations of Asia Electronics Inc.

As a result of the investigation of soil coinciding with the closure of Yokohama Operations, it was found that concentrations of PCB etc. exceed the regulatory limits. At present, the company is preparing to implement measures in accordance with the instructions of the City of Yokohama.

2) Other

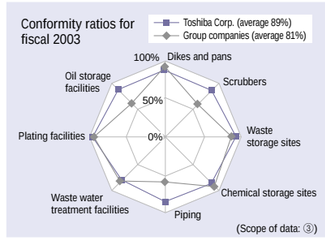
It was detected that soil of the site of Kitakyushu Operations' Development Evaluation Center—a site not previously used by Toshiba Group—contains lead exceeding the environmental regulatory limit. As the owner of the land, Toshiba is remedying the situation in accordance with laws and regulations.

■Amount of Volatile Organic Compounds Recovered from Soil and Groundwater



(Scope of data: Sites listed in the table below)

■Conformity Ratios according to Structural Design Guidelines



(Scope of data: ③)

■Purification of Volatile Organic Compounds in Soil and Groundwater

Site	Location (Japan)	Progress	Purification method*	Amount recovered* (kg)
Fukaya Operations	Fukaya, Saitama prefecture	Purification in progress	A	0.2
Komukai Operations	Kawasaki, Kanagawa prefecture	Purification in progress	A	76.0
Microelectronics Center	Kawasaki, Kanagawa prefecture	Purification in progress	A	8.7
Yanagicho Complex	Kawasaki, Kanagawa prefecture	Purification in progress	A,B,C	2.9
Taishi Area of Himeji Operations	Taishi-cho, Ibo-gun, Hyogo prefecture	Purification in progress	A	550.7
Oita Operations	Oita, Oita prefecture	Purification in progress	A	5.1
Fuji Operations, Toshiba Carrier Corp.	Fuji, Shizuoka prefecture	Purification in progress	A,B	359.0
Osaka Works, Toshiba HA Products Co., Ltd.	Ibaraki, Osaka prefecture	Purification in progress	A	0.2
Toshiba Electric Appliances Co., Ltd.	Maebashi, Gunma prefecture	Transition to monitoring	D,F	—
Kimitsu Operations, Toshiba Components Co., Ltd.	Kimitsu, Chiba prefecture	Purification in progress	A,B	208.8
Site of the former Yokohama Works, Toshiba Components Co., Ltd.	Yokohama, Kanagawa prefecture	Purification in progress	A	69.3
Kawamata Seiki Co., Ltd.	Kawamata-machi, Date-gun, Fukushima prefecture	Purification in progress	A	0.1
Kitashiba Electric Co., Ltd.	Fukushima, Fukushima prefecture	Purification in progress	A	1.3
Site of the former Kawasaki Works, Toshiba Shomei Precision Co., Ltd.	Kawasaki, Kanagawa prefecture	Purification in progress	A,F	4.8
Site of the former Yokohama Operations, Asia Electronics Inc.	Yokohama, Kanagawa prefecture	Preparation	E	—

*Purification method: A: Groundwater pumping, B: Soil gas suction method, C: Reduction decomposition method (fine iron permeation piles), D: Oxidation decomposition method, E: Interception containment method, F: Removal by excavating soil

*Amount recovered: Amount recovered during the period from April 2003 to March 2004

Recycling of End-of-Use Products

In accordance with the legal framework introduced in 2001 for a recycling-based society, Toshiba is promoting recycling of a range of end-of-use products, including not only the four types of home appliances stipulated by the Home Appliance Recycling Law in Japan, but also personal computers and compact secondary batteries as well as other equipment. Recycling has become second nature thanks to cooperation among all parties concerned.

Recycling of Household Appliances

■High Recovery Rate Maintained

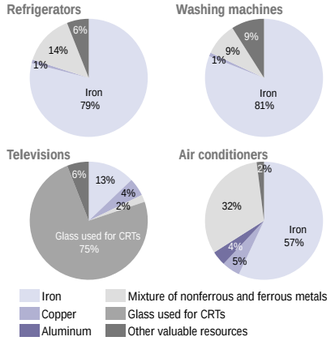
In accordance with the Home Appliance Recycling Law that came into force in April 2001, end-of-use home appliances (air conditioners, televisions, refrigerators, washing machines) are first taken back by retailers and then transferred to take-back sites designated by manufacturers.

According to data for fiscal 2003 announced by the Ministry of Economy, Trade and Industry, 10.46 million end-of-use home appliances (four products) were collected at designated facilities, a 3% increase year on year, while shipments of the four products in Japan decreased 8% year on year. Toshiba Group collected 1.58 million end-of-use home appliances (a 1% year-on-year increase), accounting for 15% of the total number of units collected nationwide; a percentage virtually unchanged from the previous year.

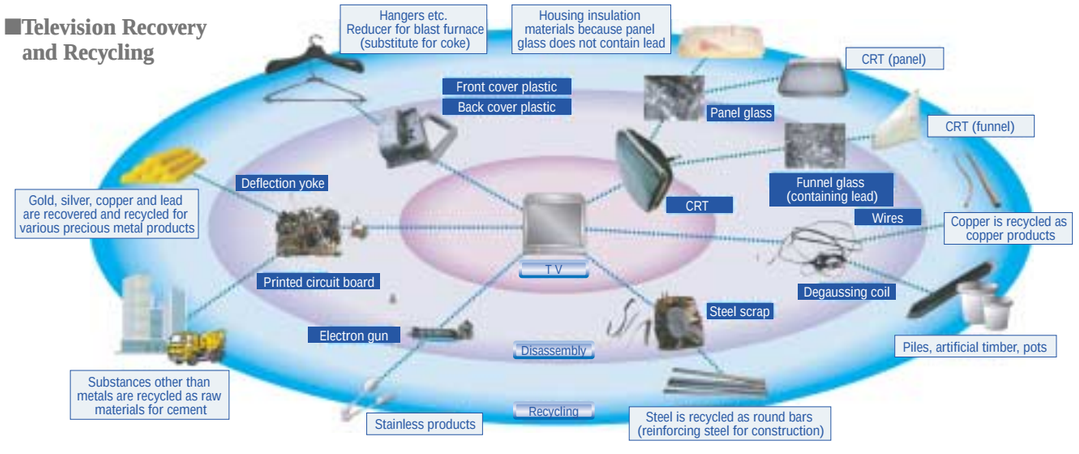
■Next-generation Recycling

For effective utilization of resources contained in end-of-use home appliances, recovery of high-purity materials is vital. Toshiba has developed several industry-leading technologies for disassembly and separation of products and removal of foreign matter, such as high-performance halogen lamp separation equipment to separate CRT glass of televisions at high speed, a method for disassembly of washing machines, and a technique for cleaning waste plastics. These technologies have made it possible to use recovered resources for new products.

■Materials Recycled from End-of-use Home Appliances (ratio by weight)



■Television Recovery and Recycling



Recycling of Personal Computers

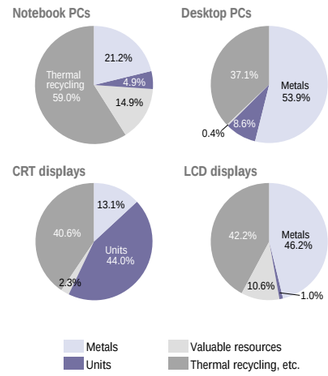
■Recycling of End-of-use PCs Discharged by Consumers

In accordance with the revision of the ministry ordinance for the Law for Promotion of Effective Use of Resources, a system for collection and recycling of end-of-use PCs discharged by consumers was introduced in October 2003. Toshiba opened the dynabook Recycling Center, which is the contact point for customers, and set up a PC recycling system in October 2003. Customers can request collection of end-of-use PCs either via the Toshiba website or by telephone.

For collection, PC manufacturers have teamed up with Japan Post to take advantage of its Eco Yu-Pack parcel post service. PCs to be discharged are collected from customers' homes without surcharge or customers take their PCs to the more than 20,000 post offices nationwide designated as collection points. Collected PCs are manually disassembled at recycling facilities in Japan.

From October 2003 to March 2004, Toshiba collected 1,132 units discharged by consumers, amounting to 10 tons of notebook and desktop PCs and PC monitors. In order to increase the recycling rate, Toshiba is recycling the plastic casing that accounts for 25% of the weight of a notebook PC (average of Toshiba notebook PCs) and endeavoring to increase the amount recycled and reduce recycling costs.

■Materials Recycled from End-of-use PCs (ratio by weight)

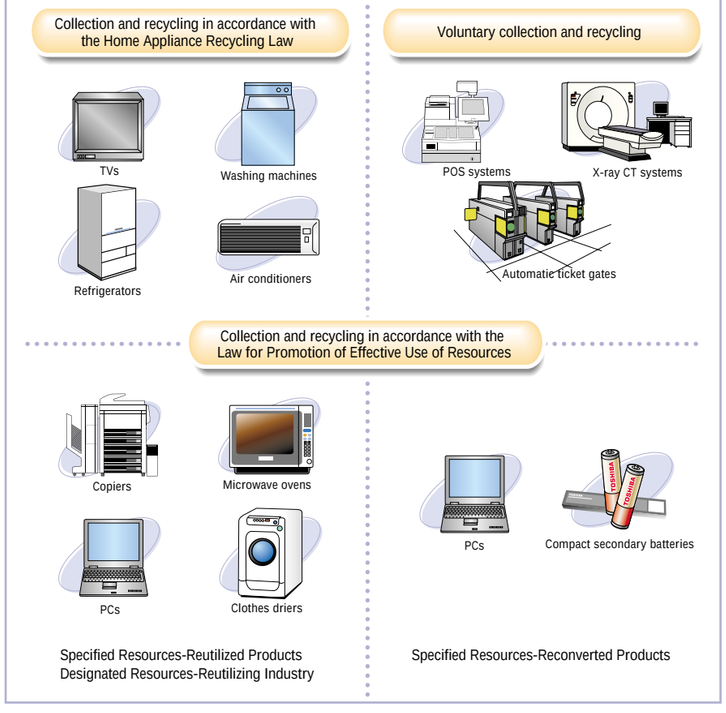


Recycling of Other Products

In addition to the four types of home appliances and PCs, Toshiba is promoting recycling of a wide range of end-of-use products, including POS systems, X-ray CT systems and automatic ticket gates, in cooperation with customers (see figure below).

Toshiba is emphasizing development of technologies to enable effective utilization of the materials recovered and reduction of recycling costs. Since reuse of parts and components is an important issue, we are promoting environmentally conscious design that facilitates reuse.

■Products Covered by Recycling



Environmentally Conscious Technologies

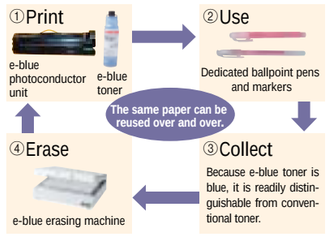
In addition to engaging in environmentally conscious product development and production, Toshiba Group seeks to contribute to the "Creation of a Society Ensuring Sustainable Development with Reduced Environmental Load," a principle set forth in The Basic Environment Law. To that end, we develop, commercialize, and introduce new environmental technologies in a number of fields.

Decolorable e-blue™ Toner

More than 90% of printed matter used in routine office work is material for temporary use that is not saved for long periods of time. Toshiba's e-blue decolorable toner can eliminate much of the wastepaper generated in office work. Text and images printed using e-blue toner can be erased using a dedicated erasing machine that features a low-power design, and photocopy paper can be used over and over. Costing about the same as conventional toner, e-blue combines environmental friendliness with economy.

In Toshiba's testing presented in the chart below, a 60% reduction in purchases of photocopy paper was achieved.

■Use of e-blue



Carbon Dioxide Absorbing Ceramics

Toshiba has developed a new CO_2 absorbing ceramic material that has 10 times the absorption capacity of conventional ceramics. It can absorb 400 times its own volume of CO_2 and repeatedly absorb and release CO_2 at high temperatures exceeding 500°C. The new ceramic material, which makes it possible to separate CO_2 from commercial boiler exhaust, is expected to be applied widely.

CO_2 absorbing ceramics

Monitoring of Groundwater Pollutants using Biosensor

Toshiba has developed a new type of biological function-emulating biosensor that can assess the toxicity of groundwater pollutants regardless of substance type or quantity. Experimental investigations have been conducted to detect low concentrations of groundwater-polluting volatile organic compounds (VOC), heavy metals, agricultural chemicals, and environmental hormones. The installation of biosensor systems in observation wells around the circumference of production facilities to constantly monitor for toxic substances in the groundwater has made possible the early detection of the leakage of toxic substances from such facilities.

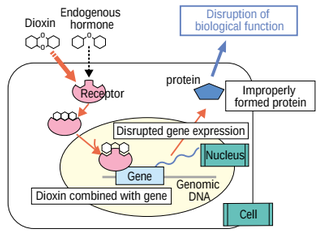
Toshiba aims to realize an advanced environment monitoring system (AEMS) that will infer the spread of pollution and its source, making possible a rapid response.

■Biosensor Concept

Risk Assessment of Endocrine Disruptors using Gene Analysis

Toshiba has developed a simple system for rapidly screening endocrine disruptors and assessing their neurotoxicity on the basis of gene analysis performed by adding test substances to homogeneously cultured nerve system cells. To help protect the natural environment and society from toxic substances, Toshiba will increase the number of marker genes and the range of types of toxicity that can be assessed using the system.

■Endocrine Disrupter Action Mechanism



Third-party Review of Environmental Accounting

TRANSLATION

Independent Review Report on Environmental Accounts
indicated in the "Toshiba Corporate Social Responsibility Report 2004"

May 20, 2004

Mr. Tadashi Okamura
President and Chief Executive Officer
Toshiba Corporation

1. Purpose and Scope of our Review

We have reviewed the "Environmental Accounts" for fiscal year ended March 31, 2004 indicated in the "Toshiba Corporate Social Responsibility Report 2004 " (the "Report") of Toshiba Corporation (the "Company") and its group companies, which was published by the Company responsible for its contents. The review consisted of performing certain procedures as described below, in relation to the collection, compilation and calculation of the information included in the Report.

Our work does not constitute an audit or examination. We therefore do not express an opinion on the "Environmental Accounts".

2. Procedures Performed

We have performed the following review procedures agreed to by the Company.

(1) We reviewed the procedures performed by the Company and the methods of accounting that were followed in the preparation of the "Environmental Accounts" information.
(2) We compared the "Environmental Accounts" information presented in the Report with the respective supporting documents and reviewed the accurateness of the calculations on a sample basis.
(3) We made inquiries to the individuals that are responsible for the Company's and group company's manufacturing sites, which were selected on a sample basis, and conducted on-site inspections of these sites and reviewed the decision-making process at each location.

3. Results of the Procedures Performed

As a result of the procedures we performed;

(1) "Environmental Accounts" of each site that was selected for inspection were identified and aggregated in accordance with the Company's policy.
(2) We found no figures that were inconsistent with supporting evidence obtained in the process of inspection at each site and are not aware of any material modifications that need to be made to the information.
(3) All information prepared by each site was summarized accurately in the corporate aggregation and disclosed properly.

Yasuo Kurihara
Representative Director
Shin Nihon Environmental Management
and Quality Research Institute

Operations covered by the review

Toshiba Corp.

- Fukaya Operations
- Fuchu Complex
- Hino Operations
- Ome Complex
- Yanagicho Complex
- Komukai Operations
- Kitakyushu Operations
- Corporate Research & Development Center
- Keihin Product Operations
- Yokohama Complex
- Yokkaichi Operations
- Himeji Operations
- Oita Operations
- Corporate Manufacturing Engineering Center
- Microelectronics Center

Subsidiaries

- Toshiba Lighting & Technology Corp.
- Toshiba Carrier Corp.
- Toshiba TEC Corp.
- Toshiba Medical Systems Corp.
- Toshiba Electron Tubes & Devices Co., Ltd.
- Toshiba HA Products Co., Ltd.

∗ The above operations were selected based on comprehensive judgment, taking the amount of environmental impact, amount of environmental protection costs and business characteristics into account.
∗ The above operations accounted for 60.8% (22.6 billion yen) of total environmental protection costs (37.2 billion yen) and 27.9% (43.9 billion yen) of total environmental impacts (157.1 billion yen).

■Good points

- Toshiba has established a method of recognizing benefits as four types of economic benefits out of environmental costs, that are an indicator of a company's environmental protection efforts.
- The Plan-Do-Check-Act (PDCA) cycle of environmental management is based on a three-tier structure—namely the corporate level, sites and major environmental facilities—and is a source of benefits in terms of environmental accounting.
- It should be noted that PDCA at major environmental facilities is done in tandem with disclosure of information to internal and external parties by means of environmental bulletin boards.
- It should also be noted that Toshiba uses risk prevention benefits as a means of evaluating environmental investments that do not lead to cost reduction and uses assumed benefits to measure the social value of reducing environmental impacts concerning air and water pollution.

■Improvements made

- The scope of aggregation of environmental accounting and calculation procedures have become clearer because the criteria of affiliated companies covered by environmental accounting and criteria for appropriation of combined costs regarding capital investments and R&D expenditures are clearly specified.
- Processes from the gathering of raw data to output of environmental accounting data and approval procedures at individual sites have been improved, and thus, the company easily could show evidence for reliability of the output.

■Issues to be addressed

Customer benefits are calculated, in principle, from the difference between the environmental impacts of previous models and succeeding models, and the calculation results tend to be lower than the actual customer benefits. We recommend establishing procedures for calculating actual customer benefits and social benefits throughout product lifecycle, as Toshiba is already engaged in this task.

The current environmental accounting should be made more sophisticated so that it will be possible to apply environmental accounting data in the management of workplaces. Utilization of environmental accounting data at workplaces is vital for achieving continual improvement.