

# Toshiba Environmental Report 2000



**TOSHIBA**

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## Corporate Profile

Company name	Toshiba Corporation
Foundation	July 1875
Establishment	June 25, 1904
Paid-in capital	¥274.9 billion (as of March 31, 2000)
Number of employees	Non-consolidated: 56,746
	Consolidated: 190,870 (as of March 31, 2000)
Group	Number of consolidated subsidiaries: 217 (Japan), 104 (Overseas)



\* Please refer to the Toshiba Annual Report 2000 for details of Toshiba's business and financial information.  
The information is also available on the Internet at [www.toshiba.co.jp/about/ir/](http://www.toshiba.co.jp/about/ir/)

# Message



At the threshold of the 21st century, based on a recognition that global environmental issues are becoming ever more pressing, Toshiba has recognized that environmental protection activities as a key task for management.

While manufacturers, to their credit, have helped create our contemporary society in which millions of people enjoy unprecedented affluence and convenience, their activities have also contributed to global environmental difficulties.

In 1988 Toshiba established a section devoted to environmental issues and promoted environmental protection activities as a practical expression of Toshiba Group's slogan—"Committed to People, Committed to the Future. Toshiba".

This environmental report is, we believe, an effective tool for communicating the breadth and depth of Toshiba's environmental protection activities to all stakeholders and the public at large.

This is the second issue of the report. We have enriched the content by including items which were not covered in the previous issue, new measures, and the changes that have taken place in the fiscal years 1995 through 1999. Also, the scope of the report has been expanded from Toshiba Corp. to Toshiba Group. Furthermore, Toshiba's goals for the coming 21st century are announced in the form of the third voluntary environmental plan.

This report includes several new items: the mid-term environmental plan which covers environmental protection measures and forms an integral part of the mid-term business plan for the period from fiscal 2000 through 2002,

environmental accounting to clarify costs concerning environmental protection and the corresponding benefits, green procurement to prioritize procurement of parts and materials that have less environmental impact, and the Toshiba Group Earth Environment Mark, a symbol of environmental protection activities.

In Japan, Year 2000 has been dubbed the first year of the recycling society. Moreover, legislation designed to promote the recycling society has come into force, as part of a concerted effort to encourage responsible use of scarce natural resources and deal with waste-disposal problems, notably the shortage of suitable sites available for final disposal and the occurrence of illegal disposal. Thus, the foundations of the recycling society are being laid.

Twelve years have passed since Toshiba started formal environmental protection activities. Based on that experience, Toshiba has graduated to a new and more sophisticated phase respecting environmental matters. In order to play a leading role in making the recycling society an everyday reality, Toshiba will enhance its environmental protection activities on five fronts: effective utilization of resources, prevention of global warming, strengthening of control of chemical substances, development of environmentally-conscious products, and recycling of end-of-use products.

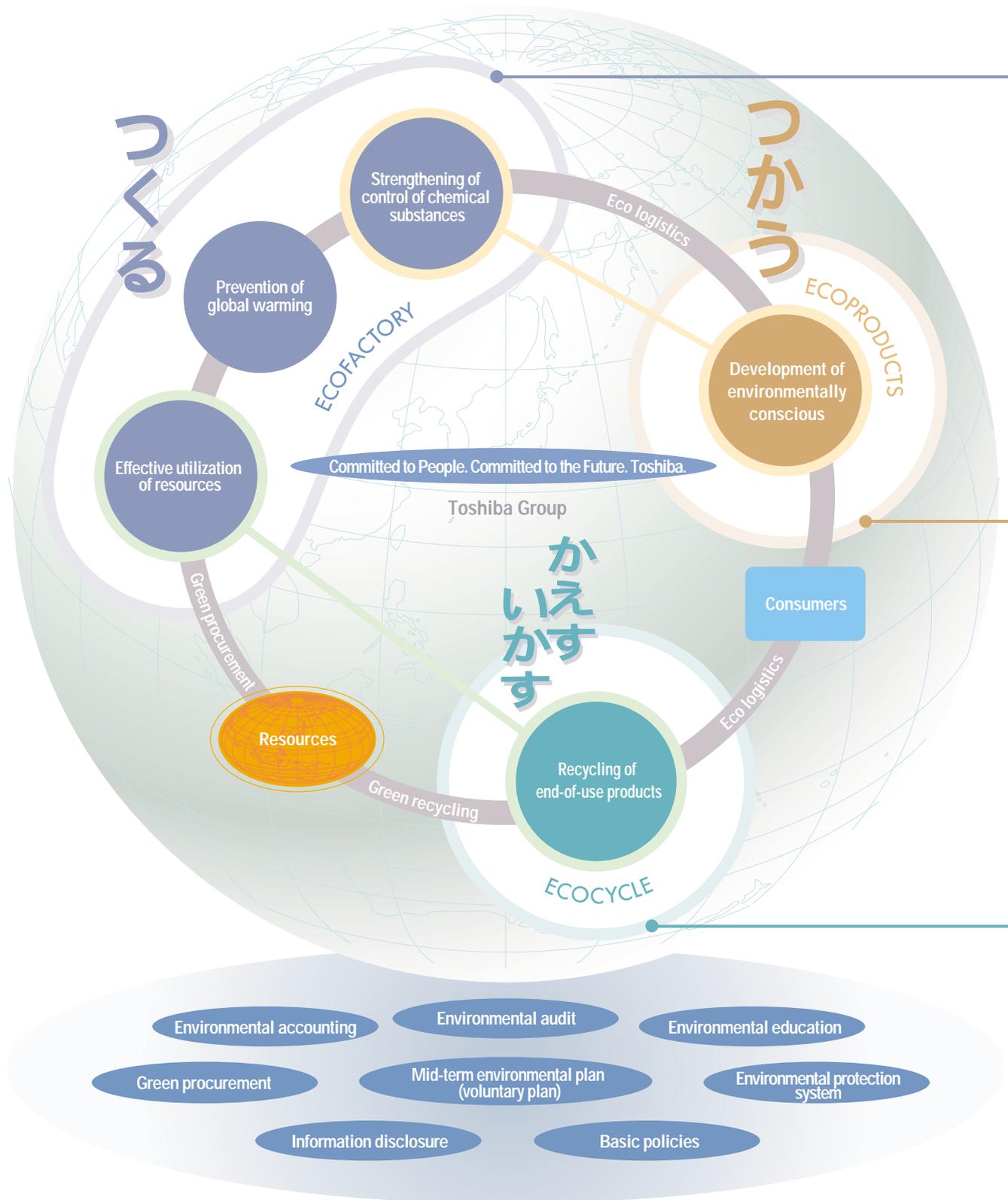
On a continuous basis, Toshiba will disclose information on these activities in environmental reports and at its website.

We will be delighted if this report helps you to arrive at a better understanding of the extent and nature of Toshiba's commitment to the environment. And we welcome your comments and suggestions.

Taizo Nishimuro  
Chairman of the Board

## Taking the lead in creating the recycling society

Integral to the product-development process at Toshiba are a searching examination of the impact of usage of the contemplated product and an effort to maximize recyclability and/or ease of disposal when it has come to the end of its life. As a practical expression of Toshiba Group's slogan— "Committed to People. Committed to the Future. Toshiba"— we are striving to reduce our impact on the Earth's environment. Concretely, our efforts encompass effective utilization of resources, prevention of global warming, strengthening of control of chemical substances, development of environmentally conscious products, and recycling of end-of-use products. These activities are underpinned by environmental accounting, environmental audits and environmental education, and furthermore, a proactive approach to the disclosure of environmental information. Thus, Toshiba is at the forefront of the drive to make the recycling society an everyday reality.





### Editorial policy

Toshiba Environmental Report 2000 mainly presents the results of Toshiba Group's environmental protection activities in fiscal 1999. This is the second issue of Toshiba Environmental Report. The first issue, Toshiba Environmental Report 1998, was published in February 1999. In accordance with the editorial policy, when analyzing changes of environmental impact data with the passage of time, we focus on sustainability. We also expanded the scope of the report from Toshiba Corp. to Toshiba Group. This report, unlike its predecessor, includes environmental accounting, green procurement and environmentally conscious logistics. However, certain items dealt with in the previous report, namely the results of measurement of quality of atmosphere and water and activities to protect the ozone layer, are excluded due to constraints of space.

#### Energy Saving Award Special Commendation ● P12-13

Toshiba received the award from the government of Japan in recognition of its commitment to energy saving and prevention of global warming, and moreover, its proactive approach to information disclosure.

The award scheme was introduced in fiscal 1999.

Energy saving equivalent to 29,000kl of crude oil was achieved in fiscal 1998.

#### Reduction of waste ● P18

The volume of waste was reduced to 9% compared with fiscal 1990.

Zero emission of waste is within reach.

#### All incinerators withdrawn from use ● P18

In view of the problem posed by dioxin, all 14 in-house incinerators were withdrawn from use by August 1999.

#### Strengthened control of chemical substances ● P14-15

Use of dichloromethane has been abolished. As a result of executing PRTR for three years, Toshiba reduced emissions of chemical substances by 239 tons.

#### Purification of ground water ● P16-17

In fiscal 1999, approx. 800kg of organochlorine solvent was collected.

#### Gains Energy Saving Award for two years running ● P12-13

Toshiba air conditioners won the Minister of International Trade and Industry Award and Toshiba refrigerator won the President's Prize of the Japan Energy Conservation Center, both for two consecutive years.

#### Toshiba Group Earth Environment Mark ● P21

This mark, introduced in June 1999, is a symbol associated with Toshiba's environmental protection activities. It is affixed to products whose environmental performance is excellent.

#### Guidelines for environmentally conscious products ● P21

These guidelines for designing environmentally conscious products and for selecting eco materials were drawn up to promote 3Rs design.

#### Green procurement starts ● P27

Green Procurement Guidelines were established and green procurement has started, initially covering 30 product categories from 1,330 companies. Green procurement will be introduced at affiliated companies step by step.

#### Network for recycling consumer electronics ● P28

In response to the law mandating recycling of certain household appliances which will come into effect in April 2001, Toshiba and partner companies have set up facilities for collection and recycling.

#### Nishi Nihon Consumer Electronics Recycle Co., Ltd. ● P28

This company was established in Eco Town, Kita-Kyushu, in response to the Household Appliances Recycling Law and has started trial operation.

#### Sapporo Plastic Recycling Co., Ltd. ● P31

This company was established in response to the law mandating recycling of containers and packages which came into effect in April 2000 and reclaims oil from waste plastics.

## Core activities

#### Mid-term environmental plan starts ● P7

The mid-term environmental plan covering environmental protection measures was drawn up and forms an integral part of the mid-term business plan for the period from fiscal 2000 to 2002. Additionally, the third voluntary environmental plan (voluntary action plan) was announced.

#### Introduction of environmental accounting ● P10-P11

Environmental costs amounting to ¥37.6 billion on a consolidated basis resulted in environmental impact reduction benefits worth ¥19.1 billion (total of direct economic benefits and assumed benefits).

#### Disclosure of information ● P35

Toshiba is committed to a proactive approach regarding disclosure of information on its environmental activities. In addition to the publication of environmental reports and the disclosure of information on environmental matters at its website, Toshiba held environment-related exhibitions and the Environmental Technology Exhibition.

#### Eco logistics ● P32

The number of vans and trucks was cut by 18% and emissions of NOx and PM were reduced by 39%, and 42%, respectively, compared with fiscal 1995.

#### Note

PXX indicates the pages concerning the item.

# Foreword

The Earth's environment is humankind's life-support system, and issues associated with it are intimately involved with the very foundation of our existence. Given that natural resources are finite, the orientation of society and the economy toward mass production, mass consumption and mass disposal needs to be tempered by adherence to other values. Throughout its operations, Toshiba has embraced preservation of the Earth's environment for future generations as a top priority. We are convinced that economic activities should be informed by the fact that our planet's resources and capacity to absorb waste are limited. 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 to innovate technology.



## Basic policy for environmental protection

Toshiba Corporation recognizes that the Earth is an irreplaceable asset, and that it is mankind's duty to hand it on to future generations in a sound state. Therefore, Toshiba promotes environmental protection activities, in a technically and financially appropriate way, and in accordance with the Basic Commitment of Toshiba Group and this 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 respecting 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 consciousness of the environment of all its employees 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.

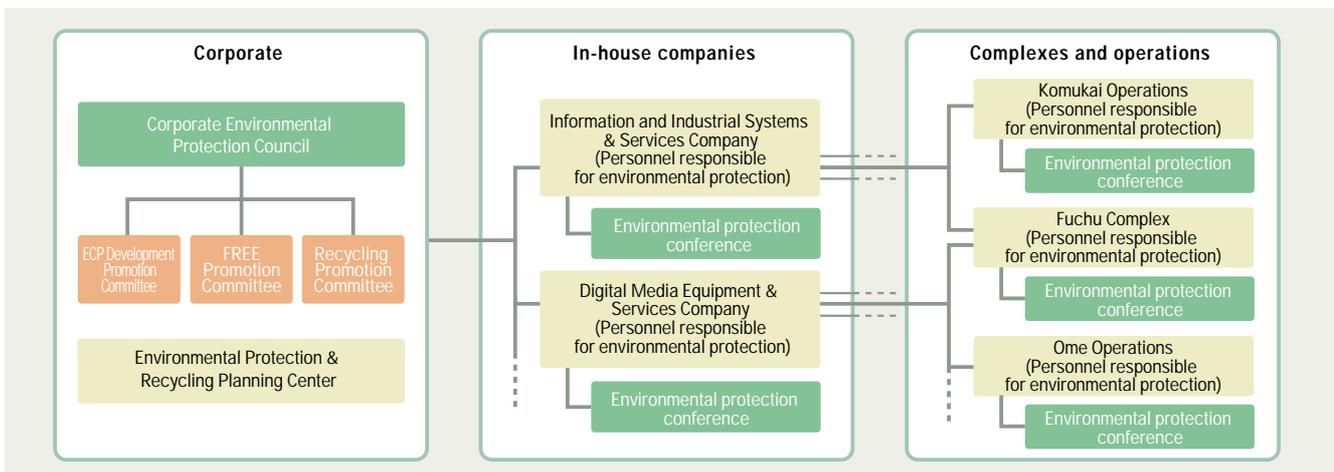
## Environmental protection system

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

specific products and regions. To heighten employees' environmental awareness and facilitate exchanges of information, Toshiba holds an annual Environmental Technology Exhibition, in which domestic and overseas subsidiaries participate. In April 1999 the organization with primary responsibility for environmental matters at Toshiba was renamed the Environmental Protection & Recycling Planning Center and its functions were enhanced.

### Organizational chart of the corporate environmental protection system



## Environmental management system

ISO-14001 certification, the international standard for environmentally-friendly systems and processes, is designed to promote sustainable economic development and an equitable apportionment of responsibilities among countries. The certification process requires that companies maintain a system to evaluate the environmental impact of their operations and products, and make continuous efforts to improve their environmental performance. Toshiba considers ISO-

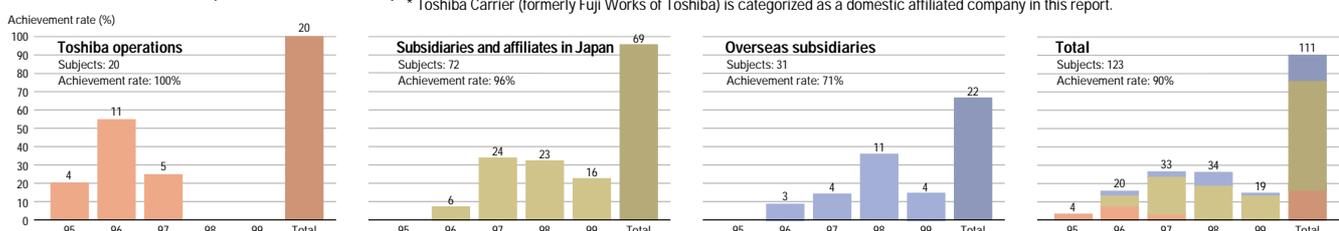
14001 certification to be a passport to inclusion in the ranks of the world's most environmentally-responsible enterprises.

Within Toshiba Group, all 20 of Toshiba Corp.'s production facilities have gained ISO-14001 certification. Overseas subsidiaries and domestic subsidiaries and affiliates are working to achieve certification for all their facilities, an achievement that will strengthen Toshiba's standing as an

environmentally-friendly enterprise.

To date, 69 domestic subsidiaries and affiliates have gained ISO-14001 certification. Regarding overseas subsidiaries, all five Toshiba production facilities in Europe have gained certification, as have many Toshiba factories in Asia and the U.S. In all, 21 overseas subsidiaries have gained ISO-14001 certification.

**ISO-14001 certification (as of March 31, 2000)** \* Numbers at the top of the bar graph indicate the number of operations which gained certification during the corresponding year.  
\* Toshiba Carrier (formerly Fuji Works of Toshiba) is categorized as a domestic affiliated company in this report.



## Voluntary Action Plan — Execution of the second voluntary plan —

The ultimate objective of all environmental endeavors is to create an economy and society that function in harmony with the Earth's environment. For this purpose, it is incumbent on companies to assume greater social responsibility and act as good corporate citizens. Indispensable to this is the formulation

of comprehensive voluntary environmental plans (action plans). Toshiba announced its first voluntary plan in March 1993, and achieved the seven initial targets specified as planned, by the end of fiscal 1995.

The current fiscal year is the final year of the second voluntary environmental

plan launched in fiscal 1996. In accordance with the plan, a corporate-wide effort has been made respecting the 12 items listed below. As of March 31, 1999, all targets had been achieved except for the three items highlighted in yellow.

### Achievement of the voluntary environmental plan

	Commitment items	Targets: compared with fiscal 1995*	Results in fiscal 1999
1	Implement product assessments	All products (continued implementation since fiscal 1993)	100% implementation
2	Reduce use of parts and materials that are difficult to recycle	Subject: Consumer products and information equipment Target: 30% reduction by fiscal 2000	32% reduction
3	Reduce weight per product function	Subject: Information equipment and control devices Target: 10% reduction by fiscal 2000	25% reduction
4	Reduce electricity consumed per product function	Subject: Consumer products and information equipment Target: 10% reduction by fiscal 2000	64% reduction
5	Reduce weight of product packaging	Subject: All industrial-use products Target: 30% reduction by fiscal 2000	25% reduction
6	Reduce time required to disassemble products	Subject: Consumer products and information equipment Target: 50% reduction by fiscal 1997 compared with fiscal 1992	54% reduction
7	Reduce use of styrofoam packaging	Subject: All products Target: 50% reduction by fiscal 2000	40% reduction
8	Reduce ratio of waste to net sales	Subject: All production and research facilities Target: 75% reduction by fiscal 2000 compared with fiscal 1990	91% reduction
9	Reduce ratio of energy consumption to net sales	Subject: All production and research facilities Target: 15% reduction by fiscal 2000 compared with fiscal 1990	5% increase
10	Secure ISO-14001 certification	Subject: All production and research facilities Target: All production and research facilities by fiscal 1997	100%
11	Establish and implement a product environmental vision	Subject: All operations Target: Establish vision by fiscal 1996 and then implement	100% implementation
12	Reduce utilization of toxic chemical substances	Subject: Electronic component and semiconductor production facilities Target: 33% reduction of the ratio of toxic chemicals used to net sales by fiscal 1997 and 50% reduction by fiscal 2000, measured against fiscal 1994	95% reduction

This color indicates that the item has been achieved.

## Mid-term environmental plan and the third voluntary plan

Toshiba announced its first mid-term environmental plan in March 2000. The mid-term environmental plan covers environmental measures and is an integral part of the mid-term business plan for the period from fiscal 2000 to 2002. Thus, environmental activities are integrated with business activities. With the objective of systematic implementation of measures, the corporate-level intention is fully reflected in the plans of in-house companies. Fiscal 2000, the first year for the mid-term plan, is the final year of the second voluntary plan launched in fiscal 1996. The third voluntary plan for the period from fiscal 2001 to 2005 was drawn up and incorporated in the mid-term environmental plan to ensure achievement of the targets set. This new voluntary plan covers Toshiba Group; that is, subsidiaries and affiliates will carry out the plan alongside Toshiba Corp.

The principal themes included in the mid-term environmental plan are

achievement of zero emission of waste, creation of environmentally conscious products, full-scale execution of green procurement, and recycling of end-of-life products.

### Zero emission of waste

Starting in fiscal 2000 and proceeding step by step, through team-based activities focused on particular types of waste, reduction of waste at source and thorough reuse and recycling, Toshiba aims to achieve zero emission in fiscal 2003.

### Lead-free soldering

Application of lead-free soldering for main consumer electronics products and personal computers started in fiscal 2000 and will be expanded step by step. Toshiba aims to apply lead-free soldering to new models of main consumer electronics products in fiscal 2001 and to all products by fiscal 2003.

### Provision of information on products

Toshiba will set voluntary environmental

standards for each product category in fiscal 2000 and increase the proportion of products which are in compliance with the standards. The target is to achieve compliance of 20% of all products in fiscal 2002 and of 50% in fiscal 2005.

### Green procurement

Toshiba started green procurement in April 2000 for about 30 product categories. Among 7,500 companies which supply materials and parts, including group companies and partner factories, green procurement is at present applied to 1,330 companies with which Toshiba deals directly.

### Reduction of release of chemical substances

To reduce release of chemical substances by 30% in fiscal 2005 compared with the level in fiscal 2000, guidelines for handling of chemical substances will be established and collection equipment installed.

## Mid-term environmental plan and the third voluntary plan

Items	Target of the mid-term environmental plan (fiscal 2002)	Target of the voluntary plan (fiscal 2005)
Zero emission of waste	Quantity of final disposal to be 2% of total discharge	Achievement in fiscal 2003
Reduce release of chemical substances	10% reduction compared with fiscal 2000	30% reduction compared with fiscal 2000
Improve ratio of CO <sub>2</sub> release to net sales	18% reduction compared with fiscal 1990	25% reduction in fiscal 2010 compared with fiscal 1990
Green procurement	Set target with fiscal 2000 as a benchmark	Set target with fiscal 2000 as a benchmark
Provide product information	Ratio of products which are in compliance with the voluntary environmental standards: 20%	Ratio of products which are in compliance with the voluntary environmental standards: 50%
Reduce electricity consumed per product function	10% reduction compared with fiscal 2000	30% reduction compared with fiscal 2000
Apply lead-free soldering	Application of lead-free soldering to main consumer electronics products and new models of consumer electronics products	Application of lead-free soldering to all products by fiscal 2003
Abolish HCFCs	—	Abolish by December 2004

\* Zero emission is defined as a final disposal quantity of 1% or less of the total discharge.

\* HCFCs is the abbreviation of hydrochlorofluorocarbons, substances widely used as refrigerant in air conditioners etc.

Pursuant to the Montreal Protocol of 1995 on protection of the ozone layer, in addition to the cessation of production of chlorofluorocarbons (CFCs) at the end of 1995, HCFCs, substitutes for CFCs, are within the scope of regulation and their use is to be abolished by 2020.

# Toward sustainable development

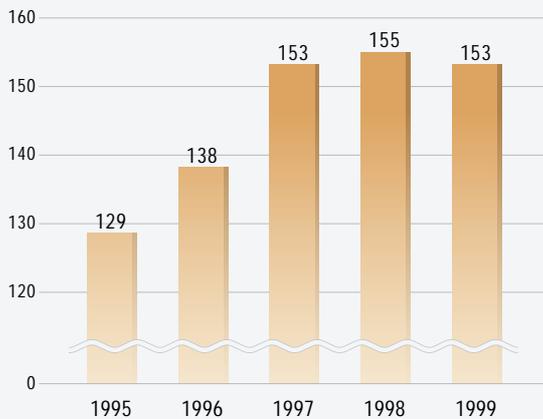
## Toshiba Group's Environmental Impact

Toshiba Group manufactures and sells a great variety of electronic and electric products ranging from heavy electrical apparatus to consumer electronics, and from information and communications equipment to semiconductors and other electronic components. Among these products, environmental impacts differ widely. This section provides an overview of the environmental impacts of Toshiba Group. These environmental impacts are utilized as indices for verifying sustainability. The figures show 5-year trends of inputs of energy, water and chemical substances, and of outputs, such as environmental impacts on water and atmosphere and discharge of waste.

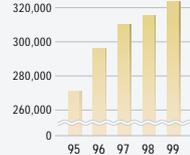
Toshiba intends to expand collection of data that can be utilized for efforts to reduce the environmental impacts imposed by its activities. These data are significant components of indices of environmental protection benefits in the environmental accounting of Toshiba Group.

### INPUT

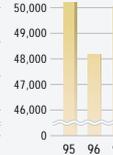
Energy: Calculated in CO<sub>2</sub> (ten thousand t)



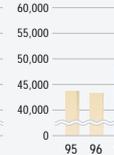
Electricity (ten thousand kWh)



Heavy oil (kt)



Kerosene (kt)



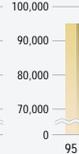
LPG (t)



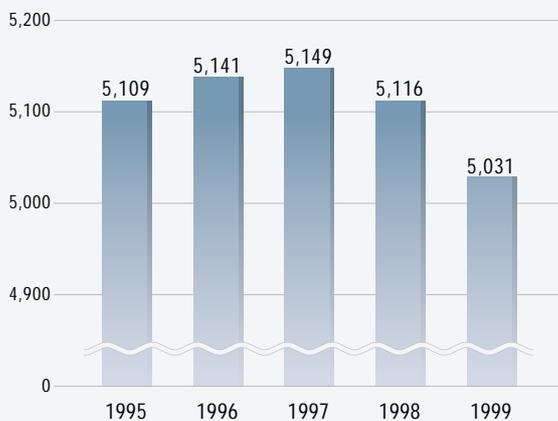
City gas (km<sup>3</sup>)



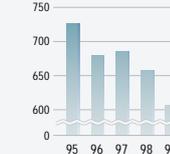
Steam (t)



Water (ten thousand t)



City water (ten thousand t)



Industrial water (ten thousand t)



Ground water (ten thousand t)



### Chemical substances\*

Amount used (t)



Release to the environment (t)



\* Environmental impact data are tabulated results of Toshiba Corp. and its 61 subsidiaries and affiliates listed at the end of the report.

\* Data on chemical substances are data for Toshiba Corp. for substances subject to PRTR (refer to page 14).

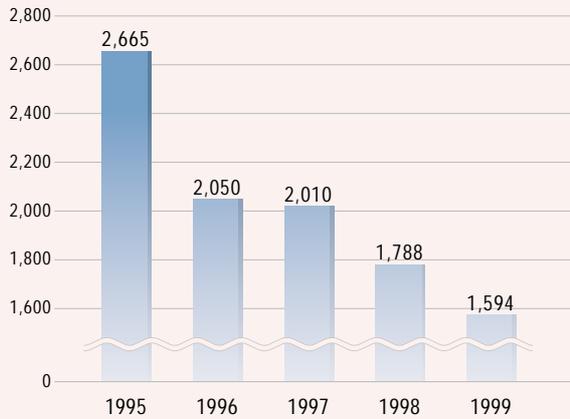
\* Water environmental impact is calculated as follows: annual average value of the measured concentration of a substance at the drain mouth multiplied by total drain discharge for the year

\* 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.

# OUTPUT

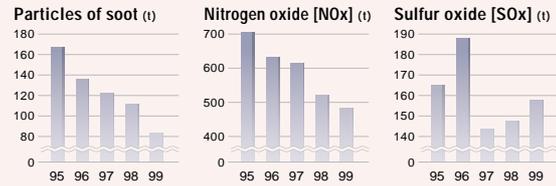
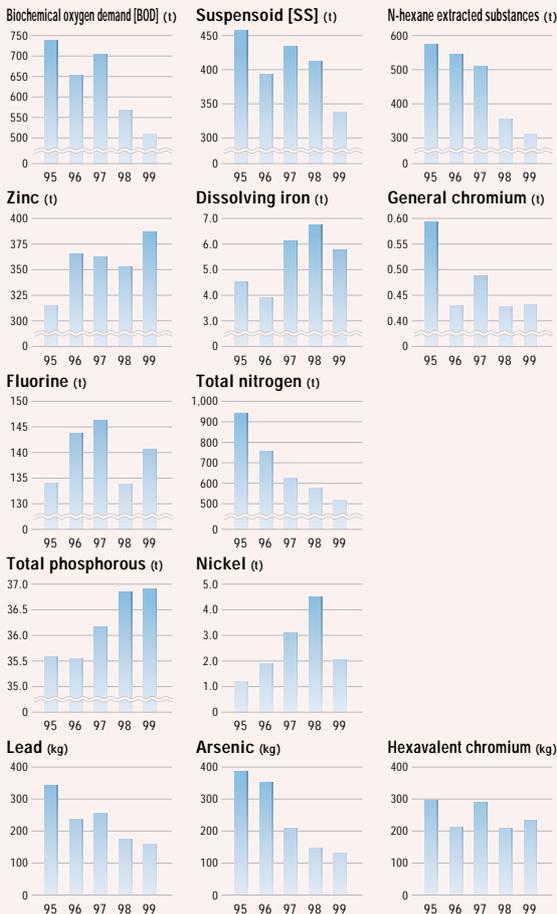
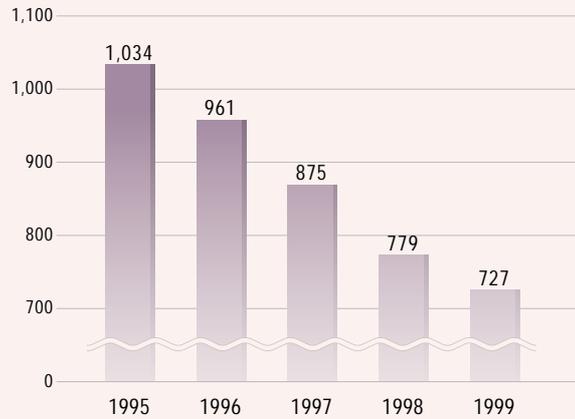
## Water environmental impact (t)\*

[Annual average value of measured concentration x total drain discharge for the year]\*

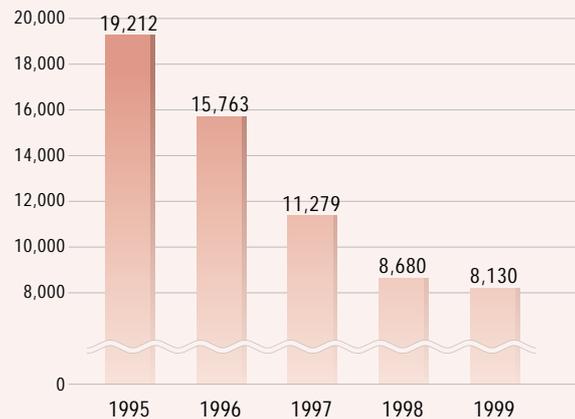


## Atmospheric environmental impact (t)

[Annual average value of measured concentration x total gas discharge for the year]



## Final disposal of waste (t)



# Environmental accounting

## Costs and benefits

\* Subject of tabulation: Toshiba Corp. and 45 domestic subsidiaries and affiliates and 16 overseas subsidiaries

\* Subject period: April 1, 1999-March 31, 2000

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

Environmental costs							
Classification	Content	Expenditure		Current expenses		Total cost	
Costs concerning operations	Reduction of environmental impacts 1)-3)	5,001	(2,913)	11,709	(8,989)	16,710	(11,902)
Content	1) Cost of pollution prevention	2,062	(1,385)	6,942	(5,350)	9,004	(6,735)
	2) Cost of global environmental protection	2,490	(1,452)	1,072	(780)	3,562	(2,232)
	3) Cost of recycling of resources	450	(76)	3,696	(2,839)	4,146	(2,915)
Cost in production flow	Green procurement, recycling, etc.	24	(15)	2,089	(961)	2,113	(976)
Management activities cost	Environmental education etc.	518	(49)	5,027	(3,149)	5,545	(3,198)
R&D cost	Development of environmentally conscious products	120	(77)	10,352	(7,605)	10,472	(7,682)
Social activities cost	Planting of plants, disclosure of information, etc.	57	(37)	1,207	(865)	1,264	(902)
Cost of recovery from environmental damage	Recovery from soil pollution, etc.	400	(363)	1,104	(885)	1,504	(1,248)
Total		6,121	(3,454)	31,489	(22,454)	37,610	(25,908)
Total expenditure during the period		298,512 (103,500)					
Total R&D expenditure during the period		334,398 (272,683)					

### In accordance with the guidelines of the Environment Agency of Japan

Toshiba has introduced environmental accounting in order to quantitatively grasp the costs and benefits of environmental protection and utilize the quantitative data as guidelines for business activities. Toshiba calculated environmental costs and their benefits in accordance with the guidelines established by the Environment Agency of Japan on May 2000. Environmental costs are capital expenditure, R&D expenditure and current expenses whose purpose is to reduce environmental impacts attributable to business activities. Environmental costs include expenses for prevention of pollution, development of environmentally conscious products and recycling.

Regarding benefits, environmental impact reduction benefits are indicated quantitatively. Also, Toshiba has defined its own standards, namely "direct benefits" and "assumed benefits," and the monetary values of these economic benefits are calculated. "Direct benefits" are those resulting from reduced charges for

electricity, water, disposal of waste, etc. and gains from sale of items with value. "Assumed benefits" are the reduction in environmental impacts on atmosphere, water and soil converted into monetary values based on data on compensation regarding environmental matters and environmental standards.

The environmental costs of Toshiba Group for fiscal 1999 amounted to ¥37.6 billion and the environmental impact reduction benefits were ¥19.1 billion. Benefits were equivalent to approximately half of the costs of environmental protection. However, if prevention of future risks and benefits to society, items excluded from the tabulation, were taken into consideration, benefits would increase markedly. Therefore, Toshiba considers investment in environmental protection to be indispensable for the maintenance and development of business activities and for the realization of a sustainable recycling society.

### Characteristics of Toshiba's environmental accounting

One of the characteristics of Toshiba

Group's environmental accounting is the assumed economic benefits of environmental protection. The volumes of reductions in environmental impacts on atmosphere, water, soil, etc. are indicated, compared with those for the previous year, and their monetary values are calculated. This makes it possible to compare different environmental impacts on the basis of common standards. Environmental issues involve negative externalities. That is, unless a party, or parties, addresses an environmental issue and bears the cost of countermeasures, a cost will be imposed on society at large. In the course of Toshiba's business activities, various substances are emitted into the environment. These emissions are, of course, within the values stipulated by regulations. Emissions by many companies, however, will result in an increase in environmental impacts, and consequently, negative externalities will arise. Toshiba is attempting to take negative externalities into account or, at least, clarify them, in order to prioritize targets for environmental countermeasures, and thus contribute to the realization of the recycling society.

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

Environmental benefits		
Benefits	Environmental impact reduction volume (9899)	Economic benefits
CO <sub>2</sub>	16,045t ( 20,498t )	443 ( 1,413 )
Final disposal of waste	550t ( 401t )	2,119 ( 728 )
Water	855kt ( 1,213kt )	390 ( 463 )
BOD	56.6t ( 61.0t )	3,542 ( 3,814 )
Fluorine	6.8t ( 0.9t )	-565 ( -72 )
Total nitride	61.3t ( 59.4t )	3,832 ( 3,719 )
Particles of soot	31.7t ( 1.0t )	2,140 ( 68 )
NO <sub>x</sub>	30.7t ( 2.1t )	2,665 ( -182 )
SO <sub>x</sub>	10.5t ( 25.5t )	-438 ( -1,063 )
Other	85.8t ( 149.8t )	4,952 ( 10538 )
Total		19,079 ( 19,427 )

\* Changes in main environmental impacts are presented on page 9. Indicated in the above table are differences of volumes of environmental impacts in fiscal 1998 and in fiscal 1999.

\* Black triangles indicate that increase in environmental impacts exceeded reduction in benefits due to increased production etc.

\* Benefits concerning waste include gain from sale of items with value.

\* Main items of assumed economic benefits are shown in the above table.

### 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, Inc. and multiplying the result by the amount of compensation in the case of cadmium pollution. To calculate the cost of environmental impacts, the case of itai-itai, a disease attributable to one of the four notorious incidents of pollution that have occurred in Japan, was used. Based on the total amount of expenditure of the polluter (compensation concerning itai-itai disease, agriculture and recovery amounting to ¥34,867 million and cadmium discharge from the mine of 2,786.97kg from 1992 to 1996), environmental impact cost per 1kg of cadmium discharge was calculated (¥12,510,720/kg). In relation to this figure, each regulated substance was given a weighting based on the environmental standards concerning water quality and ACGIH-TLV, and the

environmental cost (¥/kg)\* for each substance was determined.

\* Explanation of the concept of weighting by referring to cadmium and hexavalent chromium  
Environmental standard values for cadmium and hexavalent chromium are 0.01mg/l and 0.05mg/l, respectively, and the reciprocals, 100 and 20, respectively, are used as weighting coefficients for the substances. According to comparison using weighting coefficients, environmental impact cost of hexavalent chromium is calculated to be ¥2,502,144/kg, which is one fifth of that of cadmium. Regarding atmosphere-related environmental impacts, data of ACGIH are used for weighting.

### Issues to be addressed

In addition to direct benefits and assumed benefits, Toshiba has also calculated total benefits as an index for management. Total benefits are calculated based on a consideration of added value, such as gross profit generated by business activities and depreciation costs, and environmental costs as a proportion of total expenses of factories. Measurement of benefits is still in its infancy, and therefore, Toshiba will appraise various approaches with a view to adopting the one which provides the most effective environmental management index. Contributions to added value generated by expenses for environmental purposes are considered to be potential environmental benefits.

Toshiba will continue environmental accounting, using it as a basis for the execution of effective environmental investment that reduces environmental impacts. To this end, Toshiba drew up the mid-term environmental plan for the period from fiscal 2000 to 2002 (see page 7). Measures include achievement of zero emission of waste, reduction of emission of chemical substances, improvement of the ratio of CO<sub>2</sub> release to net sales, application of lead-free soldering, and abolition of the use of HCFCs. To carry out the plan, Toshiba will execute capital investment of ¥8 billion per year. The main items of investment for fiscal 2000 are (1) ¥2.7 billion for prevention of water pollution, (2) ¥2 billion for energy saving and (3) ¥1.6 billion for R&D. Through systematic implementation of these measures, Toshiba aims to be at the forefront of efforts to make the recycling society an everyday reality.

### References

- 1) Materials prepared by the defense counsel concerning itai-itai disease
- 2) "Preliminary study concerning evaluation of environmental impacts," Japan Ecolife Center

# Environmental considerations at the production stage

## Prevention of global warming

Prevention of global warming is an issue which needs to be tackled on a worldwide basis in the 21st century. Since the Kyoto Conference, international efforts have been made to reduce gases that cause the greenhouse effect. Toshiba is contributing to the prevention of global warming by providing energy-efficient products and by taking action to save energy and reduce CO<sub>2</sub> emissions throughout its operations.

### Voluntary action plans and results regarding reduction of CO<sub>2</sub> emissions at operations

The target and results regarding reduction of CO<sub>2</sub> emissions are shown below. The target is to achieve 25% improvement in the ratio of CO<sub>2</sub> emissions to net sales by fiscal 2010 compared with fiscal 1990. This target exceeds the target mandated by the Energy Saving Law, i.e. reduction of 1% a year.

In fiscal 1999, although use of energy increased at semiconductor and LCD manufacturing operations, corporate-wide energy-saving efforts resulted in a 3% decrease of CO<sub>2</sub> emissions compared with the previous year or a 2% decrease compared with fiscal 1990, and a 6% improvement in the ratio of CO<sub>2</sub> emissions to net sales compared with the previous year or a 10% improvement compared with fiscal 1990. Although CO<sub>2</sub> emissions of the electronic devices operations, which manufacture semiconductors and LCDs, increased 30% compared with fiscal 1990, those of other operations, such as information and

industrial systems & services, power systems & services, and home appliances, declined by 35 to 45%. The ratio of CO<sub>2</sub> emissions to net sales of the electronic devices operations improved by 29% compared with fiscal 1990. Thus, efficiency of energy consumption has been improving.

\* CO<sub>2</sub> emission coefficients of fuel and electricity are according to the data of MITI issued on April 27, 1999, and the data of Keidanren issued on July 29, 1999.

### Corporate-wide use of ESCO

Management's task is to promote energy saving and CO<sub>2</sub> emission reduction measures. Toshiba applies a threefold approach in a consistent, well-balanced manner as described below.

In fiscal 2000, all operations of Toshiba Group will be investigated with respect to energy saving. The investigations will be done by Toshiba Plant Kensetsu Co., Ltd., a subsidiary, which is an energy services company (ESCO). A comprehensive energy saving and CO<sub>2</sub> reduction plan for the medium to long term will be drawn up by specialists in energy saving.

### (1) Improvement in control

Toshiba seeks to eliminate waste throughout its operations, including air conditioning, lighting and power facilities, and promotes appropriate control of energy consumption by improving production processes and developing technology.

### (2) Investment in energy-saving equipment

According to a comprehensive plan, investment is executed in order to replace power facilities, production

facilities, air conditioning and lighting systems with those offering higher energy efficiency.

### (3) Energy-saving clean rooms

Manufacturing of semiconductors requires microlithography at dimensions equivalent to one 200th of the width of a human hair. Clean rooms whose degree of cleanness and temperature and humidity conditions are strictly controlled are used in the manufacture of semiconductors and their energy consumption is large. Energy saving at clean rooms is promoted by adopting fan filter units (FFUs) and local cleaning technology.

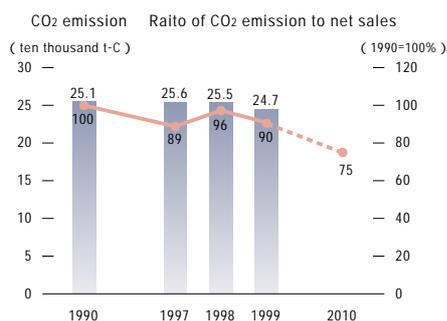
These efforts resulted in energy saving equivalent to 29,000kl of crude oil in fiscal 1998.

### Commitment regarding greenhouse gases other than CO<sub>2</sub>

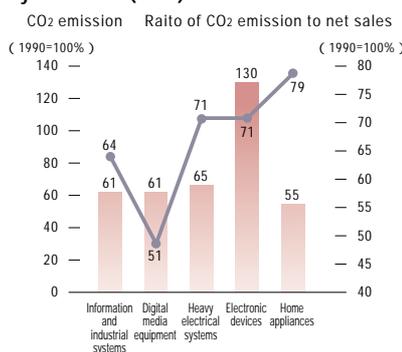
At the COP3, it was decided to control emissions of greenhouse gases other than carbon dioxide, namely hydrofluorocarbon (HFC), perfluorocarbon (PFC) and sulfur hexafluoride (SF<sub>6</sub>).

Toshiba uses HFC as a refrigerant and a heat insulating material for air conditioners and refrigerators, PFC as etching gas for semiconductor devices, and SF<sub>6</sub> as insulating material for power equipment. Toshiba is promoting collection and recycling of these substances and development of substitute substances and technologies in accordance with the industry's voluntary action plan.

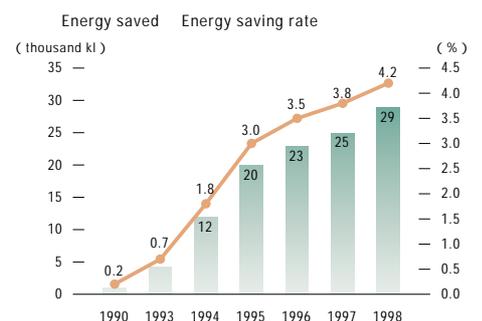
CO<sub>2</sub> emission and ratio to net sales



CO<sub>2</sub> emission and ratio to net sales by business (1999)



Energy saving (result for each fiscal year)



### Case studies for energy saving and CO2 emission reduction measures

At Toshiba, all employees at all facilities are involved in energy-saving activities. Throughout Toshiba, it is second nature for employees to switch off computers and OA equipment during lunch or whenever there is a break in the workflow, switch lights off when they are not required, set air conditioners at fixed temperatures (they are tripped at 28°C in summer and 18°C in winter). Throughout its operations, Toshiba has proactively introduced copiers and personal computers that satisfy the International Energy Star standards.

At factories, Toshiba is investing in improvement in energy efficiency, uniform consumption of electricity and adoption of new energy—strategies are fine-tuned at each factory depending on its circumstances and what it produces. At Oita Operations, the main production base for semiconductors, efforts have been made to shift peak power consumption and to recycle waste heat by installing a cogeneration system (a system which simultaneously generates power and recycles heat). Energy saving equivalent to 7,400kl of crude oil has been achieved at Oita Operations since fiscal 1990. Oita Operations was cited by the Japan Energy Conservation Center for the excellence of its energy-saving activities and gained the Award of the Minister of International Trade and Industry.



20kW solar power generation system at Term Corp.



Fuel cell system

At Fuchu Complex, a super cogeneration system—a combination of a cogeneration system and an ice heat storage system—has achieved excellent results ever since it began operating in December 1997. Thanks to the efficient supply of electricity, heat and refrigerant, energy efficiency of 81% and energy saving equivalent to 3,200kl of crude oil per year have been achieved. Also, the ice heat storage system uses night-time electricity, thus facilitating a shift of peak power consumption.

Toshiba provides products that contribute to energy saving. In view of their high efficiency, clean exhaust and small vibration and noise, fuel cells are expected to be utilized in buildings, homes and motor vehicles, as well as in factories. As of November 1999, 55 units of Toshiba's 200kW phosphoric acid fuel cell power generation system had been introduced in Japan, with six units at Toshiba factories. At Keihin Complex, the use of fuel cells reduced CO<sub>2</sub> emissions by 42% or 115t-C, compared with what would have been attainable using a conventional power-generation system.

Toshiba Lighting & Technology Corp., a subsidiary, commercialized a system

which achieves about 50% power saving by combining high-efficiency lighting equipment with a power-saving lighting control system. Many Toshiba factories have adopted this system. There were 36 energy-saving cases concerning lighting equipment in fiscal 1998, realizing power saving of 1.2 million kW.

Term Corp., a subsidiary, introduced a 20kW solar power generation system in February 1999, which satisfies 8% of that company's power requirement without emission of CO<sub>2</sub>. This system was introduced in a pilot project under the auspices of the New Energy and Industrial Technology Development Organization (NEDO).

Toshiba is keen to bring its activities respecting energy saving and the prevention of global warming to the attention of the public. Toshiba's efforts are highly regarded, as attested by the numerous awards Toshiba has won, including the Award of the Director-General of the Agency of Natural Resources and Energy, one of the Energy Saving Award Enterprise Special Commendations which were established in fiscal 1999.

### Energy saving awards received

Awards	Fiscal year	Award received	Product etc
Energy Saving Awards	1993	Award of the Minister of International Trade and Industry	Air conditioner
	1994	Award of the Minister of International Trade and Industry	Washing machine
	1995	President's Prize of the Japan Energy Conservation Center	Air conditioner
	1996	President's Prize of the Japan Energy Conservation Center	Air conditioner
		President's Prize of the Japan Energy Conservation Center	Air conditioner
	1998	Award of the Minister of International Trade and Industry	Air conditioner
		President's Prize of the Japan Energy Conservation Center	Refrigerator
	1999	Award of the Minister of International Trade and Industry	Air conditioner
		President's Prize of the Japan Energy Conservation Center	Refrigerator
Enterprise Special Commendations	1999	Award of the Director-General of the Agency of Natural Resources and Energy	Toshiba Corp.
	1999	Award of the Minister of International Trade and Industry	Fuel cell
New Energy Awards	1994	President's Prize of the Japan Energy Conservation Center and Prize for Excellence	Oita Works
	1995	President's Prize of the Japan Energy Conservation Center	Oita Works
Excellent Energy Saving Cases	1997	President's Prize of the Japan Energy Conservation Center	Oita Works
	1998	Award of the Minister of International Trade and Industry	Oita Works
		President's Prize of the Japan Energy Conservation Center	Yokkaichi Operations
	1999	President's Prize of the Japan Energy Conservation Center	Iwate Toshiba
		(Heat) Award of the Director-General of International Trade and Industry	Oita Works
	Excellent Factories for Energy Control	1998	(Heat) Award of the Director-General of the Agency of Natural Resources and Energy
1999		(Heat) Award of the Director-General of International Trade and Industry	Yokkaichi Operations
		(Power) Award of the Director-General of International Trade and Industry	Nasu Operations
		(Power) Award of the Director-General of International Trade and Industry	Takeda Toshiba

## Control of chemical substances

A vast number of chemical substances is employed for a correspondingly huge variety of purposes. Some 100,000 different chemical substances are produced for industrial applications. Although chemical substances are indispensable, they may cause serious pollution and harm human health and the environment if appropriate controls are not implemented at each stage of manufacturing, distribution, use and disposal or if an accident occurs.

Toshiba has been executing 33/50 Project to reduce use of toxic chemical substances in accordance with its voluntary environmental plan. In response to the U.S. Environmental

Protection Agency's 33/50 Project, Toshiba is reducing its use of those chemical substances that have the potential to adversely affect human health and the environment. The target was to achieve a 33% reduction in the ratio of use of such chemical substances to net sales in fiscal 1997 compared with fiscal 1994 and a 50% reduction in fiscal 2000. At factories where electronic components and semiconductors are manufactured, Toshiba reduced use of 21 highly toxic substances, selected by Toshiba for special attention, by 95% in fiscal 1999 compared with fiscal 1994 (comparison of the ratios to net sales).

### Toshiba's PRTR

Toshiba's six facilities in Kawasaki participated in a pilot PRTR project initiated by the Environment Agency in December 1997. Additionally, triggered by the PRTR survey in June 1998 conducted by five industry associations representing the electric and electronics industries, Toshiba executed PRTR at all its facilities and also expanded the scope to include affiliated companies which are not members of any of the five industrial bodies. Toshiba executed its third PRTR in fiscal 1999. Presented in the table below are the results of the company-wide PRTR survey conducted by Toshiba in fiscal 1999. Of 177 chemical substances

Toshiba's PRTR (tabulation results for fiscal 1999)

Substance number	Substance name	Number of facilities	Amount used (ton)	Amount released to atmosphere (ton)	Amount released to water systems (ton)	Amount consumed (ton)	Amount removed and treated	Amount transferred as industrial waste (ton)	Amount recycled (ton)
1	Zinc compound	6	193.4	0.1	3.2	99.4	0.1	0.1	16.4
8	Antimony and antimony compound	3	42.2	0	0	407.2	0	0	13.5
15	Hydrogen chloride	5	46.2	2.8	0	0	42.9	42.9	0
18	Chlorine	6	1,472.1	0.4	0	1,065.3	2.9	2.9	401.0
21	Xylene	10	167.0	107.6	0	4.9	1.1	1.1	9.0
24	Chromium compound (hexa)	3	3.4	0	0	1.0	1.3	1.3	0
25	Chromium compound (except hexa)	1	0.2	0	0	0.1	0	0	0.1
32	Chloroform	1	0.8	0	0	0	0	0	0
34	Cobalt and cobalt compound	3	623.6	0	0	600.2	2.5	2.5	19.8
37	Cyanogen compound	2	0.9	0	0	0	0.9	0.9	0
50	Dichloromethane	3	1.5	0.6	0	0	0	0	0.7
58	N.N-dimethylformamide	2	0.6	0.1	0	0	0	0	0.5
61	Oxalic acid	2	5.7	0	0	4.8	0	0	0
63	Styrene	1	18.7	0.8	0	0	15.6	15.6	0
68	Copper compound	2	61.6	0	0.1	23.7	0	0	37.4
79	Toluene	8	248.8	191.2	0	9.7	6.9	6.9	33.3
80	Lead compound B	4	5,171.0	0	0	5,056.9	0	0	112.6
81	Nickel compound	4	4.7	0	0	3.3	0.1	0.1	0.4
86	Barium and barium compound	3	2,260.3	0.1	0.1	2,143.1	0	0	76.7
87	Arsenic and arsenic compound	2	0.8	0	0	0.1	0.1	0.1	0.1
88	Hydrazine	1	0.4	0	0.4	0	0	0	0
93	Phtalic acid di (2-ethylhexyl):DOP	1	0.4	0	0	0	0	0	0
94	Hydrogen fluoride	1	0.5	0	0	0.5	0	0	0
96	Fluorine compound (inorganic)	6	634.9	2.1	4.9	0.1	544.8	544.8	72.8
104	Boron and boron compound	6	25.8	0	0.7	10.1	0	0	0.5
105	Formaldehyde	1	1.6	0.2	0.9	0	0.3	0.3	0
107	Manganese compound	2	1.5	0	0.1	0.6	0	0	0.2
110	Molybdenum and molybdenum compound	4	199.3	0.2	0	157.7	0	0	27.3
118	Aluminum compound	4	783.9	0	0	582.8	181.3	181.3	19.8
121	Ethanolamine	3	220.3	12.2	0	0	28.3	28.3	154.0
146	Zirconium and zirconium compound	1	711.0	0	0	683.4	0	0	27.6
148	Tungsten compound	2	170.9	0	0.3	169.3	0.1	0.1	0.7
175	HCFC	2	407.7	4.1	0	403.5	0	0	0
176	HFC	7	76.4	9.3	0	62.7	0.4	0.4	0
177	PFC	9	110.8	55.0	0	8.4	21.7	21.7	0
178	Sulfur hexafluoride	7	255.8	55.5	0	186.0	0.2	0.2	12.9
179	Lead solder	6	55.6	0	0	31.7	0	0	22.0
Total			14,359.7	442.3	10.7	11,716.5	851.5	851.5	1,059.3

\* Number of facilities is the number of facilities which use the substance.

\* 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 by incineration, neutralization, decomposition, reaction treatment, etc. within a facility.

subject to PRTR (excluding CNP and pentachlorophenol whose substance numbers are 73 and 103, respectively, which are not approved for agricultural use any more), Toshiba uses 37, of which 5 are within the scope of the part of the PRTR survey specifically for the electric/electronics industry.

The number of substances used by Toshiba has been reduced from 41 to 37 and the amount of use has also been reduced from 15,800 tons to 14,360 tons in the three years. Furthermore, release to the environment has been reduced from 692 tons (4.4% of the amount used) to 453 tons (3.2%) (refer to page 8). Greater reduction in the release compared with reduction of the amount of use is attributable to implementation of measures to reduce release at processes and capital investment, such as installation of SF<sub>6</sub> collection equipment. Among the more heavily released chemical substances were: toluene 191 tons (195 tons in fiscal 1998, 239 tons in fiscal 1997), xylene 108 tons (142 tons, 208 tons), sulfur hexafluoride (SF<sub>6</sub>) 56 tons (130 tons, 156 tons) and perfluorocarbon (PFC) 55 tons (55 tons, 55 tons). Release of dichloromethane was 0.6 tons (1.2 tons, 8.3 tons) and its use was

abolished in fiscal 1999. According to the results of the Keidanren's third survey, covering 84% of industry in Japan, announced in June 2000, the three chemical substances most heavily released to the atmosphere were: toluene 65,609 tons, xylene 41,140 tons and dichloromethane 19,284 tons. Toshiba accounts for about 0.2% of the total release of chemical substances in Japan.

### Ranking of substances and release reduction plan

Toshiba usage 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 apply appropriate controls to use. Based on a categorization of chemical substances into three classifications (prohibition of use, reduction in use, control of release), chemical substances are controlled in accordance with the Chemical Substances Control Rules. Ranking of substances and control classifications are shown in the tables below. Some 2,000 substances are classified into three ranks, A, B and C, based on the laws and regulations and hazard, and control classifications (prohibition of use, reduction in use,

control of release) for each substance are determined based on the number of applicable laws and regulations and the amount of release. Moreover, in accordance with the control activities and the guidelines for each control classification, control of chemical substances is being strengthened so as to reduce environmental impacts.

The target is to achieve a 30% reduction in the amount of release of chemical substances in fiscal 2005 compared with fiscal 2000.

### Disclosure of information and risk communication

In Toshiba Environmental Report 1998, tabulated data on Toshiba's PRTR conducted in fiscal 1997-comprising amount used, amount released to atmosphere, amount released to water systems, amount consumed and treated, amount removed, amount transferred as industrial waste, and amount recycled-are published for 41 substances. Regarding the communication of information to interested parties, it is important to consider what kinds of information should be disclosed and how. From this perspective, in addition to disclosure of figures, Toshiba is emphasizing clear explanation of its policies and the contents of activities, explanation of Toshiba within the context of Japan as a whole, and explanation reflecting the pattern of change over the course of time.

The need for disclosure of information is expected to increase. For example, increasingly, evaluations of companies-made on the basis of data disclosed by the companies themselves-have impacts on companies, either directly or via the mass media. To bring about a situation in which progress in reduction of release of chemical substances leads to reduction of total risk, Toshiba is making efforts to disclose information in an appropriate manner and to provide easy-to-understand explanation, and also is promoting fruitful two-way communication with local residents and local government.

### Ranking of substances and substance control classification

Ranking	Grounds	Control classification
Laws and regulations / Hazard A	Mandatory	Prohibition
Laws and regulations / Hazard B	In accordance with Toshiba's policy	Prohibition
	Number of applicable laws and regulations and amount of release (two or more, 1 ton or more)	Reduction (Setting of target of release)
	Number of applicable laws and regulations and amount of release (one or more, 10 tons or more)	Reduction (Setting of target of release)
Laws and regulations / Hazard C	Number of applicable laws and regulations and amount of release (other than the above)	Control (Control of release)
	Number of applicable laws and regulations and amount of release (three or more, 1 ton or more)	Control (Control of release)
	Number of applicable laws and regulations and amount of release (two or more, 1 ton or more)	Control (Control of use)
	Number of applicable laws and regulations and amount of release (other than the above)	Control (Control of use: used / not used)

### Substance control classification and control action

Control classification	Prohibition of purchase	Control in accordance with the release amount reduction plan	Control of material balance	Control of handling / control of facilities	Assessment / compliance with relevant laws and regulations (including release standards*)
Prohibition					
Reduction	×				
Control	Amount of release	×	×		
	Amount of use	×	×	×	
	Used / not used	×	×	×	×

\* Control of material balance: In accordance with Pollutant Release and Transfer Register (PRTR)  
 Control of handling: Compliance with the standards for handling of organic solvents and specific substances  
 Control of facilities: Compliance with the guidelines for environmental structures  
 Assessment: Execution of evaluation prior to new purchase of chemical substances

## Response to ground water pollution

### Pollution by organochlorine solvents

Ever since ground water pollution was detected at Taishi in Hyogo prefecture in 1983, Toshiba has conducted surveys of soil and ground water pollution at its factories. At present, purification of ground water and monitoring are being done at Fukaya Operations in Saitama prefecture, Komukai Operations and Microelectronics Center in Kawasaki, Yanagicho Complex in Kawasaki, Toshiba Carrier Corp. (former Fuji Works of Toshiba Corp.) in Shizuoka prefecture, Nagoya Branch Works in Nagoya, Osaka Operations in Osaka prefecture, Taishi Area of Himeji Operations in Hyogo prefecture and Oita Operations in Oita.

### Overall commitment

At eight operations and at Nagoya Branch Works, a total of 574 pumping wells and 154 observation wells are installed for monitoring of trends. In fiscal 1999, about 750kg of solvents was collected by pumping up water. Moreover, at three factories, 42 soil gas suction wells are installed and about 50kg of solvents was collected from soil.

At some factories, concentration of pollutants in ground water is declining at a moderate pace.

\* At Nagoya Branch Works, the purification pile system is applied. Holes were made in the subject area and a mixture of reaction agent to decompose pollutants and crushed stone to ensure water permeation is placed in the holes to form purification piles which are pile-shaped reactors. Purification is performed when polluted ground water passes through these piles.

### Case study 1

Two case studies illustrating Toshiba's activities to date are reported below.

Fukaya Operations reports survey results to the Environment Division of Saitama prefectural government and the Environment Department of the local government of Fukaya, and is conducting surveys and implementing countermeasures under their guidance.

To deal with soil pollution caused by trichloroethylene, a purification method using soil-gas suction has been applied since December 1998. 16 suction holes were made and at five locations where concentration of pollutants is high, detoxification by active-carbon adsorption is being applied.

To deal with pollution of ground water, 30 observation wells had been made by January 1999; concentration of pollutants in ground water and the ground water level are being monitored, and purification by pumping up of water is being done.

Regarding the first aquifer, two pumping wells have been installed adjacent to the facility which formerly used trichloroethylene. Purification is being done by pumped-water aeration in combination with active-carbon adsorption.

Average concentrations of pollutants in these two wells were 0.026mg/l and 0.014mg/l for the period from January to December 1999.

The direction of flow of in this aquifer is from west to east, and to prevent leakage of pollution beyond the site, a barrier well has been installed at the eastern side of the site which is downstream of the ground water flow and purification by pumped-water aeration in combination with active-carbon adsorption is being performed.

As a result of investigation, direction of flow in the second aquifer was found to be from east to west (from outside the site to inside the site). And because 1) pollution is limited to a part of the east side of the site, 2) trichloroethylene is detected around the facility where it was never used, and 3) substances which are not used by Toshiba are detected in the ground water pumped up, it is assumed that polluted ground water has flowed eastward into the site from outside the site.



Pumped-water purification system

## Case study 2

At Taishi Area of Himeji Operations, high-concentration trichloroethylene was detected in two water sources (shallow aquifers) when the local government of Taishi conducted an investigation of the quality of the sources of the water supply in 1983. Then, in accordance with the guidance of the local government of Taishi and Hyogo prefectural government, Toshiba investigated the ground water quality and soil at the factory site.

As a result, pollution was found and about 1,000m<sup>3</sup> of soil was removed from the polluted area. A shallow well and a deep well in the site adjacent to the polluted area were replaced with purification wells and pumped-water aeration, the state-of-the-art technology at that time, was applied and the treated water used for industrial purposes.

The effect of purification was investigated on a continuous basis and in the light of new findings Toshiba sought to determine the most effective measures. However, the measures implemented initially were maintained, in view of technical difficulties and because there were few cases to refer to regarding implementation of measures respecting ground water of deep aquifers.

Since 1996, quality of water in the shallow well at the factory site has satisfied the environmental standards. At wells outside the factory site concentration of pollutants declined. According to measurement of water quality at 20 fixed-point observation wells conducted by the local government of Taishi and Hyogo prefectural government, water quality has satisfied the value of the environmental standards since 1995. Regarding the deep well, the annual average concentration of pollutants was 3.46mg/l in 1996 compared with 5.70mg/l in 1983, and the decline in concentration was slow-paced.

Following the discovery of the polluted area, systems and procedures for pollution control were put in place at the factory, storage facilities and piping were improved, and use of trichloroethylene was abolished. In 1993 use of 1.1.1-trichloroethane, used as a substitute for trichloroethylene, was abolished.

Thereafter, in accordance with the progress of the investigation and purification technologies, the factory established a committee of experts in October 1998 whose task was to determine ways of accelerating purification of ground water in deep aquifers, based on the guidance of the local government of Taishi and

Hyogo prefectural government. In accordance with the committee's advice, the factory drew up a plan for a survey of the site.

From December 1998 to August 1999, based on the plan for the survey, behavior of pollutants was analyzed utilizing state-of-the-art engineering and sampling and analysis methods. As a result, average concentration of pollutants of 170 samples at 4 locations up to a depth of 70m was found to be 8.2mg/l. At the location where the problem seemed to be most severe, the highest concentration was detected, 98mg/l at a depth of 48m. At greater depths, the concentration diminishes. At a depth of 70m, the concentration was 0.4-0.7mg/l. It was also found that most trichloroethylene at this location has been drawn toward the deep pumping well and removed as a result of pumping, and moreover, diffusion downstream has been suppressed.

In November 1999, a plan covering measures to be implemented at the deep well was drawn up in accordance with the advice of the committee. To ensure purification, the plan calls for the installation of eight pumping wells, a purification system to treat pumped-up ground water by active carbon, and seven observation wells for monitoring.

Upon securing the approval of Hyogo prefectural government in December 1999, installation of the pumped-water purification system in accordance with the above plan was commenced in January 2000. The system is expected to start operation in June 2000.

Efforts to ensure the quality of ground water will be continued at all operations of Toshiba.

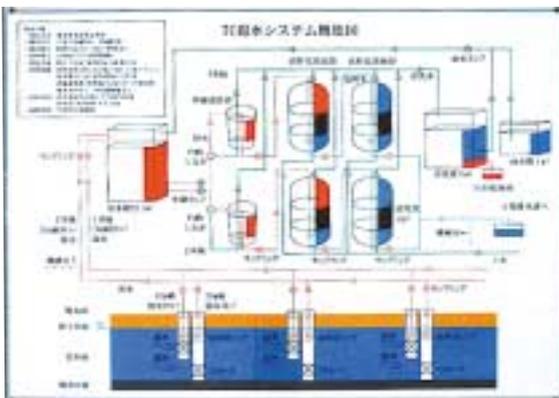


Diagram which explains functions of the system

## Zero emission of waste

### Approaches for achieving a recycling society

Clearly, there is a need to establish a recycling society in which limited resources are used effectively and to protect the Earth's environment from pollution by waste. Toshiba is working to reduce the volume of waste and to promote recycling and effective utilization of resources.

Toshiba pursues three approaches. The first approach is development of environmentally conscious products with low environmental impacts, based on product assessment conducted at the design stage to evaluate the contemplated product's environmental impact. The second approach is reduction of waste generated in the course of manufacturing. And the third approach is reduction of waste attributable to end-of-life products and promotion of recycling. Toshiba's corporate-wide drive to reduce waste is spearheaded by the FREE Promotion Committee and the Recycling Promotion Committee, organizations subordinate to the Corporate Environmental Protection Council. At first, Toshiba concentrated on clarifying the volume

of each type of waste. Subsequently, the focus has been shifted from reduction of waste to reuse and recycling and to avoiding the causes of waste at the source.

### Results for reduction of waste

The graph below shows the results for reduction of the volume of waste consigned for disposal. In fiscal 1999, 91% reduction compared with fiscal 1990 was achieved, exceeding the targeted 74% reduction by a wide margin.

In the graph, a great increase in the recycling rate is apparent, reflecting the decrease of the volume of waste consigned for disposal.

This result is attributable to vigorous exchange of information with companies which handle industrial waste and the thorough implementation of a project to achieve the efficient and effective separation of waste materials for easy recycling.

### Targeting zero emission

At Yokkaichi Operations, reduction of residual chlorine was achieved by

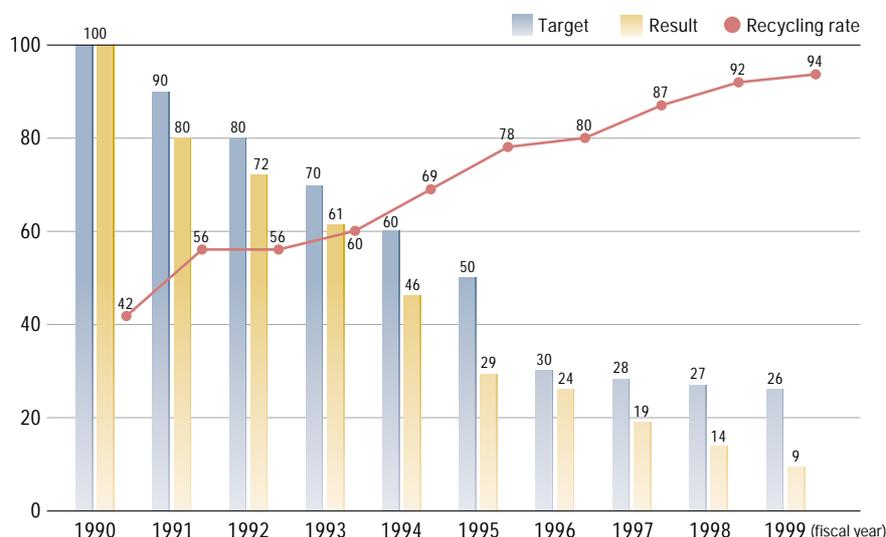
changing the neutralization agent for treatment of drains from hydrochloric acid to sulfuric acid, making it possible for sludge contained in drains to be used as an ingredient for cement. Thanks to these efforts, the volume of waste for final disposal (landfill) as a proportion of the total volume of waste declined to 0.4% in fiscal 1999. Thus, zero emission according to Toshiba's definition was achieved at Yokkaichi Operations.

Based on this achievement, activities to reduce the volume of final disposal of waste as a proportion of the total volume of waste to 1% or less in fiscal 2003 were started in order to achieve zero emission at all Toshiba operations.

To prevent pollution caused by dioxin, operation of 14 incinerators used at Toshiba operations was terminated by August 1999.

### Targets and results for reduction of waste and trend of recycling rate

Ratio of waste to net sales (fiscal 1990 = 100%)



Recycling center at operations

# Environmental audits

## EASTER

In accordance with Toshiba's audit system known as 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 are conducted. The main objectives of an audit are to achieve continuous improvement of environmental protection activities and to grasp the actual situation regarding environmental protection. A supplementary objective is to achieve improvement in the level of environmental protection technology. In the light of environment-related laws and regulations and change in society at large, audit items and criteria are revised every year. Audits are performed by a group of auditors consisting of a chief auditor and auditors who are qualified in accordance with the Toshiba Standards for Auditors and have passed the certification test and completed a practice audit. Regardless of whether they are employees of Toshiba Corp. or its affiliated companies, auditors join a group of auditors to perform an

\* Environmental Audit System in TOSHIBA on basis for ECO Responsibility

audit of any Toshiba Group company. Thus, the experience of auditing provides opportunities for auditors to deepen their experience and refine their skills.

### Audit items

There are four audit items: environmental management systems, control of workplace, degree of achievement of the voluntary plan, and creation of environmentally conscious products. Level evaluation is done in accordance with the criteria for each item. Each of the four items has its own detailed evaluation subjects and items to enable itemized level evaluation so that issues that need to be addressed are clarified.

### Feedback of audit results

Results of an audit are classified into the results of level evaluation, issues to be addressed, and proposals for further improvement, compiled in an audit report and reported to the personnel responsible for environmental protection at the organization subject to the audit. Then, the personnel responsible for environmental protection draw up

an improvement plan covering urgent and important issues pointed out by the audit. Issues which require large investment or for which it will take time to implement a measure are included in the mid-term environmental plan for systematic execution.

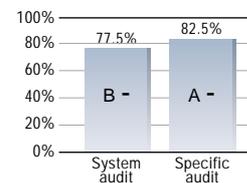
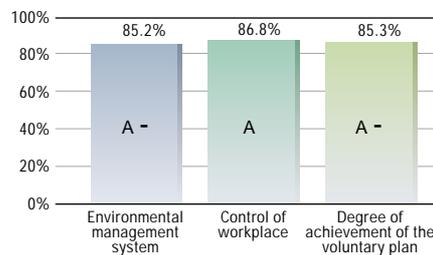


Review of audit results



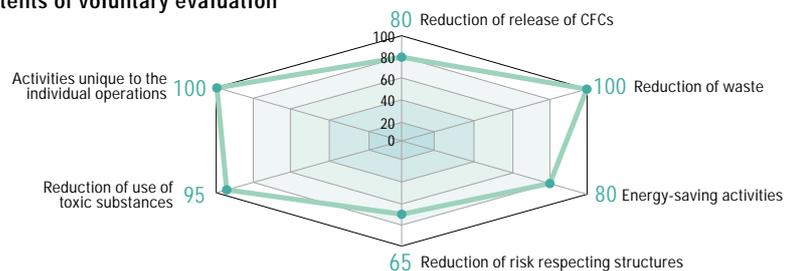
Auditing in the field

### Example of results of level evaluation



Creation of environmentally conscious products (technology audit)

### Contents of voluntary evaluation



# Environmental education

## Education according to position

In order to maintain and enhance the level of environmental protection, all Toshiba personnel receive environmental education according to their position and the tasks in which they are engaged.

The education system is designed to enhance the environmental consciousness and expertise of personnel at every level from new employees to senior management. Education for managerial personnel focuses on maintenance and improvement of skills necessary for the management of environmental protection activities. The curriculum includes the basic policy for environmental protection, the laws and regulations concerning the environment, the voluntary environmental action plan (VPE), the environmental management system (EMS) and environmental audit. Not only Toshiba personnel but also personnel of companies which have a long-term presence at Toshiba operations of Toshiba and those of suppliers receive environmental education according to their tasks.

## Education according to speciality

Education is conducted for ISO 14001 internal auditors and specific personnel. Also, education of development and design engineers regarding product assessment and development of environmentally conscious products is conducted.

In the education of internal auditors, education provided by an external certified organization is also utilized to maintain fairness and improve the level. Education of specific personnel is provided for those engaged in the handling of toxic substances, facilities which generate noise and vibration and other tasks which may directly impact the environment. To ensure that personnel are aware of potential environmental impacts and what emergency actions should be taken in the event of an accident, field training is also conducted. Education of development and design engineers underpins creation of products with low environmental impact by enriching engineers' understanding of the concept of

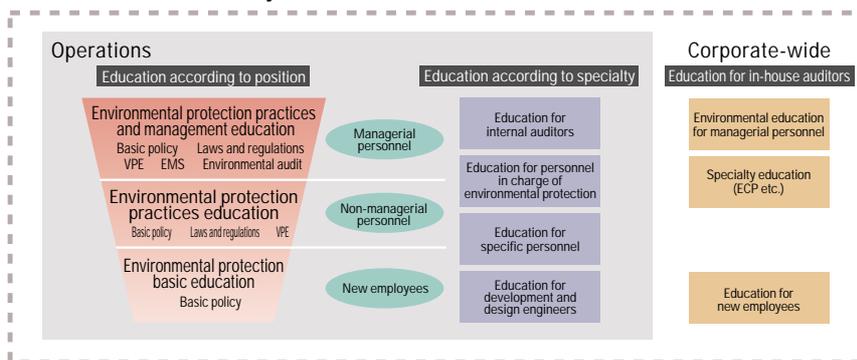
development of environmentally conscious products and promoting the reflection of that concept in the design and development of products.

## Benefits and issues

These various education programs help each individual employee to understand the environmental problems Toshiba is facing, the impact of his or her task on the environment, and the importance of ensuring compliance with laws and regulations. As a result of the execution of environmental education, participation of all personnel in continuous improvement activities is becoming the norm throughout Toshiba's operations.

On the other hand, there is a need to rearrange the corporate-wide education system and to foster specialists and qualified personnel on a continuous basis. From now on Toshiba will conduct environmental education of managerial personnel at the corporate level and education for the fostering of environmental protection specialists.

Environmental education system chart



Education for new employees

A textbook for environmental education and leaflets



## Activities to raise awareness regarding environmental protection

As a part of its activities to raise awareness regarding environmental protection, Toshiba is promoting installation of environmental bulletin boards at all operations, distribution of environmental cards to employees and periodic dissemination of environmental news. Also by opening environmental pages on the intranet sites of operations, communication

and sharing of information on environmental protection is promoted. Due to utilization of the Intranet, information on environmental activities of other operations has become easy to access and each employee's awareness regarding environmental protection is being raised.



Education for specific personnel (training for emergency)

# Environmental considerations regarding products



## Environmentally conscious products

Toshiba strives to create environmentally conscious products: that is, products whose environmental impact is minimized at every stage of their entire life cycle—from materials procurement, manufacture and distribution, through to consumption and eventual disposal. Toshiba considers there are three aspects to environmentally conscious products (ECPs). They are design, assessment and display of environmental performance. For each element, Toshiba has established in-house systems, guidelines and tools to promote development of ECPs.

In addition to thorough product assessment at the development and design stages, Toshiba started green procurement of materials in April 2000. Also, the Toshiba Group Earth Environment Mark, a symbol associated with Toshiba's environmental protection activities, was introduced in June 1999. This is affixed to products whose environmental performance is excellent.

Regarding design, the guidelines for designing environmentally conscious products were improved and the guidelines for selection of eco-materials were drawn up. 3R design for recycling, reduction and reuse has been promoted.

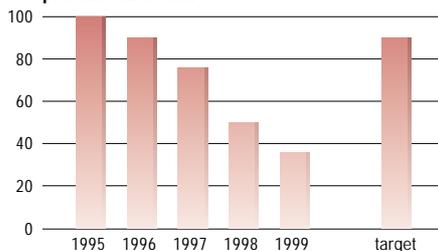
In February 1999, for the second year running, Toshiba air conditioners received the Minister of International Trade and Industry Award and Toshiba refrigerators won the President's Prize of the Japan Energy Conservation Center in recognition of their excellence in energy saving. This was the sixth time for Toshiba air conditioners to be commended by the Energy Conservation Center, an organization affiliated with the Ministry of International Trade and Industry.

In the voluntary plan, targets for reducing environmental impacts are designated and made public. Toshiba is currently in the final year of its second voluntary plan. The graphs below indicate the progress that has been made respecting several criteria

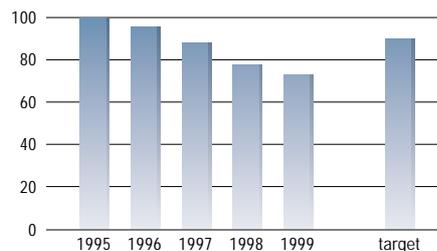
included in the second voluntary plan. The targets for reduction in weight per product function and reduction in electricity consumption per product function have already been achieved. Toshiba has announced the third voluntary plan whose final year is 2005. Toshiba promotes creation of environmentally conscious products by setting stringent targets.

In the following pages, Toshiba's commitment to the environment is illustrated by referring to four major consumer products, semiconductor products, personal computers, mobile equipment and escalators, and also to green procurement.

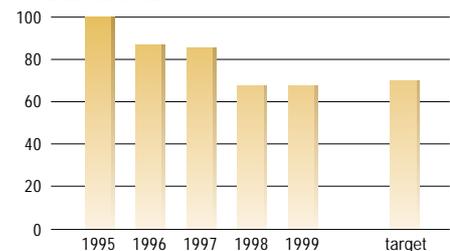
**Reduction in electricity consumption per product function**



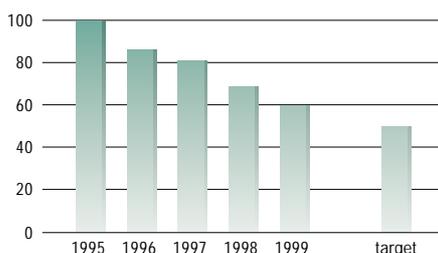
**Reduction in weight per product function**



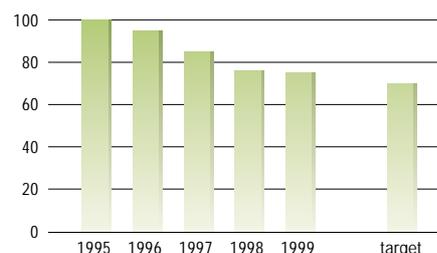
**Reduction in use of difficult-to-recycle parts and materials**



**Reduction in use of styrofoam**



**Reduction in weight of packaging materials**



## Room air conditioners

Air conditioners account for around a fifth of total household electricity consumption in Japan. Energy saving during use of air conditioners is desirable also from the viewpoint of reduction of emission of CO<sub>2</sub>.

Toshiba has been leading the air conditioner industry. Toshiba air conditioners are characterized by their energy saving and environmental performance. The environmental performance of Toshiba air conditioners is used as the basis of targets set in the new Energy Saving Law. The new refrigerant R410A which does not deplete the ozone layer is used for all major models of Toshiba air conditioners.

Toshiba's development of new environmental and energy-saving technologies has been highly regarded. In 1999 Toshiba air conditioners were once again commended by the Energy Conservation Center and received the Minister of International Trade and Industry Award, the highest award, for the second consecutive years. Toshiba air conditioners have received this award six times in the 10 years since the award was established—a track record unequalled in the air conditioner industry.

Main features of the Plasma Daiseikai series RAS-285YDR, which received the award in 1999, are introduced below,

and compared with those of the 1998 model.

### (1) Energy saving

- 1) Energy utilization efficiency Average COP for cooling and heating (Standard set by the Energy Saving Law: 4.90)  
4.90 5.30 (8% improvement)  
Cooling rating COP  
4.79 5.28 (10% improvement)  
Heating rating COP  
5.00 5.32 (7% improvement)
- 2) Energy consumption  
Annual electricity consumption is reduced to 969kWh, which is about a 50% reduction compared with a model introduced seven years ago.
- 3) Heating performance at low temperature  
5.8kW is the highest in the industry. Highly-efficient heat pump heating is available even in regions where it gets very cold.
- 4) Display of electricity charge on the remote controller

A remote controller for interactive communication with the air conditioner unit was developed. Electricity charge and indoor and outdoor temperatures are displayed on the remote controller, enabling users to execute energy-saving operation that meets their needs. Users' participation in energy saving is promoted by cultivating users' awareness of energy saving.

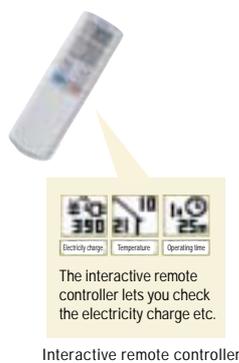
### (2) Energy saving and recyclability

- 1) Difficult-to-recycle parts and materials as a proportion of the total product weight were reduced to 23% for the indoor unit and 18% for the outdoor unit.
- 2) Adoption of concentrated winding for the stator core for the compressor motor resulted in 35% reduction in use of copper wire.
- 3) Weight was reduced by 10% due to elimination of a line filter and eight other inverter-related parts.
- 4) The air purifier built into the air conditioner unit can be washed and is recyclable, the deodorizing filter is recyclable, and the negative ionizer is maintenance-free.

### (3) Energy saving

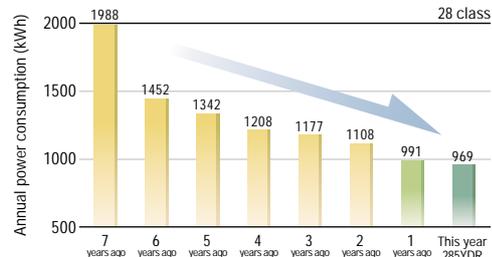
- 1) HFC refrigerant R410A whose ozone depleting coefficient is zero is adopted for all main models of Toshiba air conditioners.
- 2) A function to generate negative ions which are considered to be beneficial to health and a plasma air purifying function are equipped to ensure comfort in highly airtight energy-saving homes.

COP (Coefficient of power)  
COP = cooling or heating capacity (kW) / power consumption (kW)

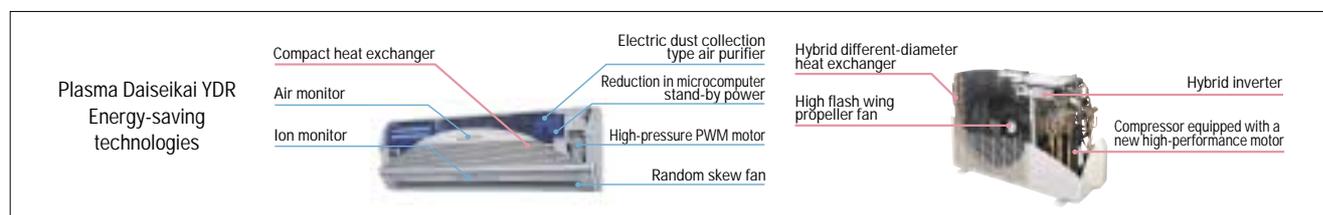
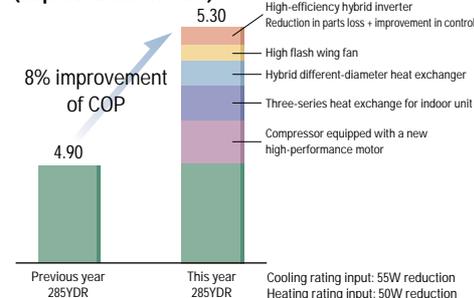


### Annual power consumption

More than 50% reduction compared with a model introduced 7 years ago



### Improvement of energy-saving performance (improvement of COP)



## Refrigerators

### (1) Reduction of power consumption

Toshiba refrigerators received the President's Prize of the Japan Energy Conservation Center in 1999, for the second consecutive year.

In 1998, due to adoption of the twin cooling system, 32% reduction in energy consumption compared with the previous year's model was achieved. And in 1999, a further 31% reduction was achieved.

Products introduced in 1999 are equipped with two cooling devices, one dedicated to the freezer compartment and the other for the refrigeration compartment, to achieve optimum control of the freezing cycle and the refrigerating cycle. This novel design has the following advantages:

Improved performance of inverter compressor and fan motor for heat radiation

- Improved defrosting control
- Improved loss of the power source drive circuit

- Elimination of dew prevention heater
- Reduced heat leakage etc.

### (2) Commitment to environmentally conscious refrigerators

Toshiba is committed to achieving environmentally conscious refrigerators not only in terms of energy saving but also in various other respects.

Refrigerators introduced in 1999 can

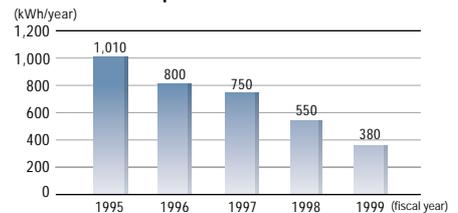


Refrigerator (GR-471K)

retain the freshness of foods for twice the length of time possible with conventional models, and so they help reduce food waste. Due to improved cooling capacity, storage at constant low temperature with high humidity is possible and eucalyptol air anti-bacteria function is adopted.

R&D of easy-to-recycle products using materials and parts with little environmental impact has been stepped up. Current R&D themes include abolition of the use of vinyl chloride (gaskets and lead wire), lead (printed circuit boards etc.), and halogen (printed circuit boards) and adoption of cyclopentane as an insulator blowing agent.

### Power consumption



## Washing machine/dryer

In February 2000 Toshiba introduced the world's first washing machine/dryer equipped with a DD inverter, model TW-F70. Direct Drive inverters are used in conventional fully automatic washing machines and achieve extremely quiet operation. The characteristics of the DD inverter motor—quiet operation, high torque, as well as precise detection of the number of revolutions and torque—are brought into full play in the TW-F70.

Besides its excellent basic performance and ease of use, the TW-F70 is a thoroughly environmentally conscious product.

### (1) Water saving

The amount of water required for rinsing is less than in the case of a conventional washing machine, because the amount of residual water is reduced by adoption of a drain valve and the spin-dry rate is also improved.

The TW-F70 is the first product of its type equipped with a pump to supply bath water to the washing machine, thus reducing water consumption.

### (2) Energy saving

Power consumption is reduced by wring wash and pre-heat spin dry.

### (3) Low noise and little vibration

Due to adoption of the DD inverter motor, fluid balancer and oil suspension system, noise and vibration are reduced, making the product suitable for use even at night.

### (4) Resource saving

Product mass is reduced thanks to a resource-saving design. Notably, the DD inverter eliminates the need for a belt pulley while adoption of the fluid balancer reduces the weight required.



Washing machine/dryer (TW-F70)

### Comparison of washing machine/dryer products

Environmental criteria	Toshiba	Company A	Company B
Average water consumption (Water saving)	11L / kg	13L / kg	15L / kg
Power consumption (Energy saving)	750Wh / kg	982Wh / kg	954Wh / kg
Noise (spin dry) (Living environment)	45dB	59dB	56dB
Product mass (Resource saving)	9kg / kg	17kg / kg	14kg / kg

Because of difference in washing capacities, comparison is made per unit capacity.

## Televisions

In Japan, televisions are subject to a law mandating recycling of household appliances and the revised Energy Saving Law.

### (1) Environmentally conscious parts and materials

In order to reduce environmental impacts at the disposal stage, Toshiba has adopted nitrogen-or phosphorus-based halogen-free flame-retardant materials instead of conventional bromine- or chlorine-based materials for cabinets and printed circuit boards (paper phenol circuit boards) of televisions.

Because the material used for cabinets (denatured PPE) suffers very little degradation, recyclability of end-of-use products is improved. Its strength, oil resistance and chemical resistance are superior to those of the conventional material (flame-retardant PS).



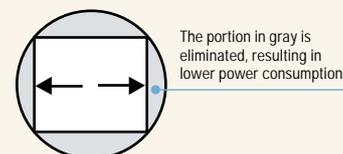
36-inch flat wide TV 36ZP50

### (2) Energy saving

In accordance with the revised Energy Saving Law which adopts the front-runner method, manufacturers are required to ensure that the average annual power consumption of their televisions is less than the regulated value by fiscal 2003.

Characteristics of Toshiba's energy-saving design are the main power-off zero watt function executed via the remote controller, degaussing-off function and square-neck picture tube.

### Cross-sectional view of a picture tube neck



Toshiba is the only manufacturer to have adopted square-neck picture tubes for televisions.

By changing the shape of the cone of the valve from a round shape to a square shape, the interval between electronic beams and deflection yoke is reduced and deflection sensitivity is enhanced, resulting in 25% reduction in power consumption for picture scanning. Toshiba televisions with square-neck picture tubes satisfy the revised Energy Saving Law earlier than the deadline.

## Semiconductor products

From the design stage onward, development of Toshiba semiconductor products is informed by a careful consideration of environmental impacts. Semiconductors with sophisticated functions are in strong demand as a means of enhancing environmental performance of the products in which they are applied. In the development of semiconductor products, Toshiba emphasizes resource saving through miniaturization and reduction of weight and thickness and low power consumption (energy saving).

Enhanced functionality of semiconductor products spurs development of environmentally conscious products. For example, increased operational frequency of a semiconductor leads to miniaturization of the equipment in which the semiconductor is incorporated, resulting in resource saving and reduced power consumption.

Toshiba commercialized the paper thin package (PTP) in fiscal 1999. Compared with the TSOP conventional thin package (thickness of 1.2mm), thickness and weight of PTP are

reduced to about one tenth. With a thickness of 0.13mm which is thinner than a business card, PTP is the world's thinnest and the most lightweight semiconductor package. The three-dimensional mounting of PTP enables stacking of up to eight units with a combined thickness of 1mm, thereby greatly increasing density.

To achieve higher-density semiconductors, Toshiba will continue to focus on R&D and commercialization of leading technologies.

Item	Product name	Features	Benefits (compared with previous Toshiba product)
Energy-saving products	TPCS8204	PW-MOSFET adopting trench gate structure	25% reduction in power consumption
	ST1500GXH21	High-pressure resistance SW device with a unique gate structure	40% reduction in SW loss
	TA1307P	IC for power source control incorporating intermittent control function	95% reduction in stand-by power consumption
Efficient utilization of resources	PTP	New three-dimensional stacking package technology	Thickness and weight reduced to 1/10
	TCM5023LU	CMOS sensor of optical lens integrated package	43% reduction in mounting area
	TH58512DC	SmartMedia equipped with two 256Mbit NAND	50% reduction in mounting area
	TMPN3120A20U	50% reduction in chip mounting area and package	50% reduction in mounting area
	2SK3387	PW transistor with improved wiring and smaller package	50% reduction in mounting area

## Personal computers

Toshiba has been striving to reduce power consumption of personal computers and to create environmentally conscious personal computers. As a part of its disclosure efforts, Toshiba announced voluntary environmental standards for Toshiba personal computers for the Japanese market.

The voluntary environmental standards set many environmental targets and Toshiba intends to increase the number of models which are in compliance with the standards. PC models in compliance with the voluntary environmental standards bear Toshiba Group Earth Environment Mark to inform consumers of the fact.

Voluntary standards consist of the following criteria:

- 1) Energy saving, resource saving, recyclability, long-term use
- 2) Green procurement, use of recycled materials, consideration regarding disposal at the end of use

These criteria include use of halogen-free materials to prevent generation of dioxin and excellent expandability to facilitate long-term use of products.

The DynaBook SS 3410/3440 notebook PCs, introduced in February 2000, satisfy these voluntary standards.



Voluntary environmental standards for PCs

## Personal-computer-related products

Effective utilization of resources is promoted by increasing the density of HDDs. Use of foam polypropylene for bulk packaging material was abolished and aliphatic polyester polymer is used instead. This material can be 100% organically decomposed in a natural environment (soil, water, seawater, etc.) where many microorganisms exist. Also, incineration is easy because of low calorific value and no soot or toxic gas is generated.

- (1) Organic decomposition in soil  
Condition: Black soil in JSP Kanuma Laboratory



- (2) Organic decomposition in a lake  
Condition: 25°C  
Approx. 90% decomposition in a month



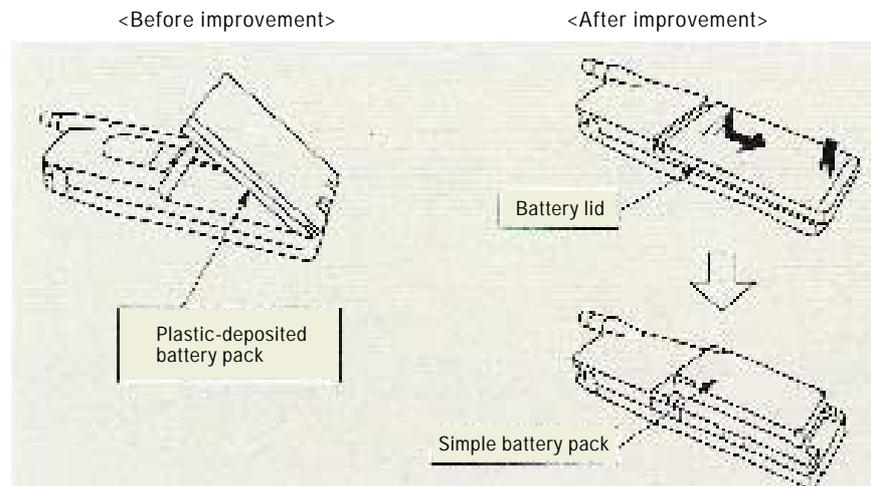
Use of styrofoam as packaging material for the MAGNIA series of PC servers,

which weigh 80kg, was eliminated and cardboard is used instead. A 32% reduction in weight of packaging material has been achieved. Regarding materials used for the MAGNIA series themselves, in 1996 Toshiba switched from sheet metal and molded parts for the main units to polypropylene steel plate which does not require painting or use of ozone depleting substances. More recently, this material was superseded by high-impact polystyrene (HIPS) whose advantages include excellent recyclability.

## Cellular telephones

Battery packs of cellular phones used to be integrated with the main unit by plastic deposition. Adoption of simple battery packs resulted in the following improvements:

- 1) Easy-to-dismantle structure, because of separation of a simple battery pack and battery lid (plastic), facilitates recycling.
- 2) Elimination of the deposition process resulted in higher yield, achieving resource saving and reduction of waste.



## Terrestrial digital broadcasting transmitters

Toshiba has developed terrestrial digital broadcasting transmitters to ensure smooth introduction of next-generation broadcasting. They offer the following advantages over the first digital transmitters:

### (1) In-house development of an amplifier circuit and review of circuit structure

To achieve energy saving and resource saving, improvement of efficiency and performance of an amplifier is important. Toshiba developed an amplifier circuit whose output is 1.7 times higher than that of a conventional circuit. In addition, 83% reduction in coaxial cables between amplifier circuits and 30% reduction in substrate circuit area are achieved. 48% reduction in the parts

count and 68% reduction in number of soldering connections led to reduced use of copper.

### (2) Improvement of the cooling system

Radiation efficiency is enhanced by improving the radiation fin. The cooling system is changed from the airflow duct system to the compact fan system and the air duct is eliminated.

### (3) Compact transmitter

Due to the above improvements, the configuration, which consisted of five digital transmitters, each with a 129W power amplifier, now consists of three 200W digital transmitters, resulting in energy saving, resource saving and space saving, specifically 43%

reduction in power consumption, 25% reduction in weight, smaller configuration, 36% reduction in floor space requirement and smaller rack.



Compact transmitter

### (4) Treatment of steel plate for main units

Secondary generation of toxic substances is prevented by use of treated steel plates for racks.

## Escalators

Resource saving and reduction of waste are emphasized from the development stage onward.

The TD series of escalators commercialized in 1999 feature the improvements listed below, compared with a conventional escalator. The comparison is under the condition of a floor height of 4m.

- 1) 12% reduction in weight (resource saving)
- 2) 90% reduction in use of lubricant (reduction of waste)
- 3) 3.5% reduction in power consumption

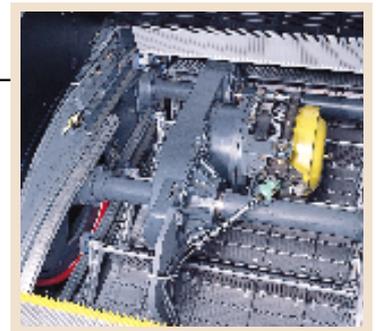
In addition to these environmental aspects, the length of the escalator is shortened by 230mm for space saving.

Thanks to adoption of the direct drive system, a motor, speed decreasing gear, step drive sprocket, and belt drive sheave are integrated. Power of the motor is decreased by a planetary gear and is directly transmitted to the step drive sprocket and the belt drive sheave by a flat gear. The direct drive system eliminated the need for step drive chains and belt drive chains, thereby dispensing with the need for lubricant for chains.

The motor and the speed decreasing gear used to be located outside the step-reversed portion, but in the case of the direct drive system, they are located inside of the step-reversed portion, making it possible to reduce the length of the escalator. In addition to these improvements, review of the overall structure and the use of aluminum die-cast integrated steps led to reduction in parts count and weight.



TD series escalator



Direct drive system

## Green procurement

Green procurement, that is, to accord priority to parts and materials whose environmental impacts are low in purchasing, constitutes an important element in the creation of environmentally conscious products. Procurement items are classified into three categories: items for use in products, items for use during production activities, and office supplies such as stationery.

### Commitment regarding items for use in products

In December 1999 Toshiba drew up the Green Procurement Guidelines which specify criteria concerning reduction of environmental impacts of procurement items and, in April 2000 Toshiba started full-scale green procurement. Toshiba holds conventions for its suppliers to promote green procurement in cooperation with them.

### Commitment regarding items for use during production activities

For sub-materials, such as tools and fixtures, paints, plating solution, thinner, and alcohol, Toshiba is applying the Environmental Assessment System since 1995.

### Commitment to raise awareness of employees

Use of environmentally conscious office supplies and stationery is important for raising the awareness of employees regarding the environment. In 1997, Toshiba introduced a system for registering eco-mark certified products and products that are recommendable from the viewpoint of environmental considerations, so as to expand procurement of environmentally conscious office supplies.

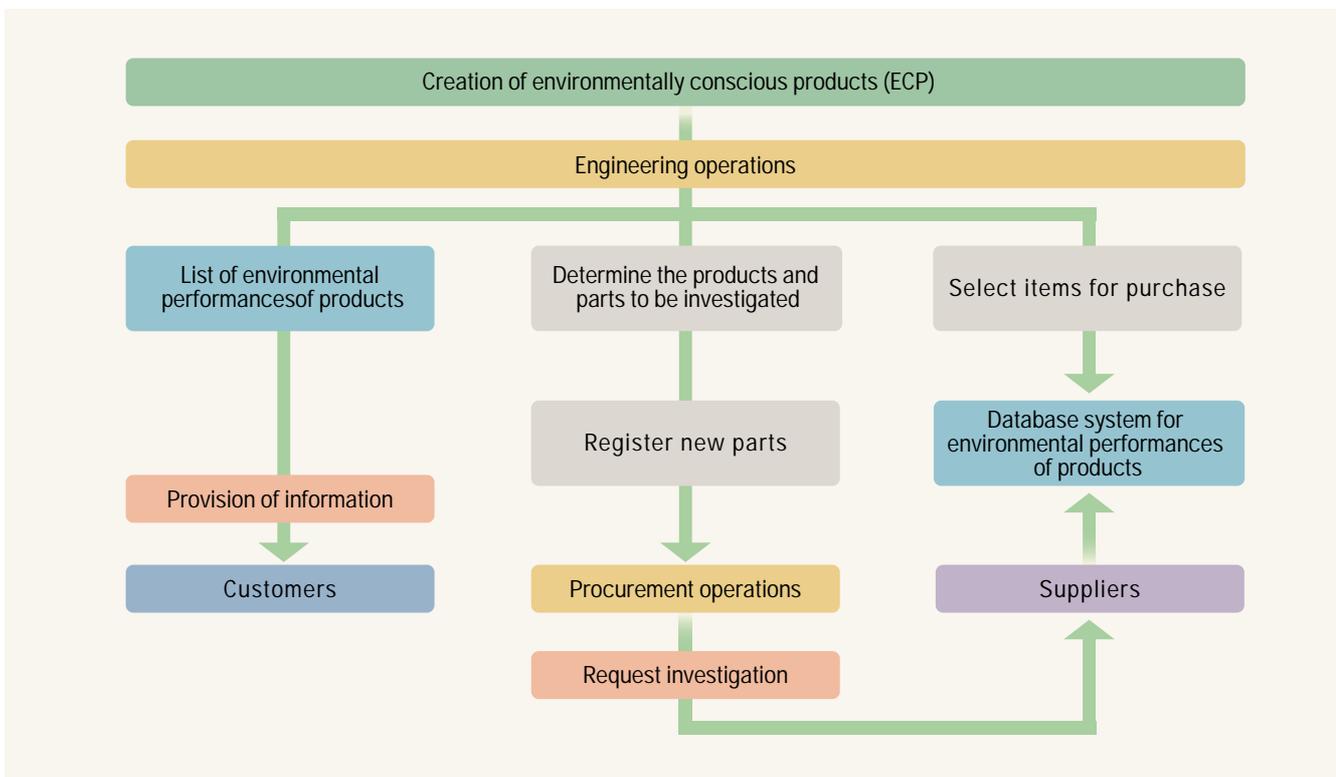


Green Procurement Guidelines



Convention for explanation of green procurement

### Flow of green procurement activities



# Various environmental considerations

## Recycling of household appliances

In Japan, economic development and the associated mass production and mass consumption generate a vast quantity of waste. Suitable sites available for landfill are becoming scarcer. Furthermore, waste has emerged as a major issue in the context of efforts to achieve effective utilization of resources.

In order to reduce the volume of waste and establish a recycling society, it is crucial to achieve the following:

- (1) Reduction of generation of waste
- (2) Reuse of end-of-use products and parts
- (3) Recycling of waste

In 1998 the Household Appliance Recycling Law was enacted in order to ensure recycling of end-of-use household appliances.

### Household Appliance Recycling Law

In Japan, every year, in all, some 20 million units of the four major large household appliances—televisions, refrigerators, washing machines and air conditioners—are disposed of, amounting to 650,000 tons of waste. To ensure proper collection and processing of this waste and to promote effective utilization of resources, the Household Appliance Recycling Law was enacted in June 1998 and will come into force on April 1, 2001.

In order to establish a recycling system for the main end-of-use household appliances, namely, televisions, refrigerators, washing machines and air conditioners, discharged from homes, offices, etc., this law stipulates the roles of the parties concerned. Consumers bear the cost of collection,

transport and recycling; retailers are obliged to deliver the appliances they receive from consumers to manufacturers; and manufacturers are obliged to conduct recycling.

Toshiba's activities go far beyond compliance with this law. The entire Toshiba Group is making efforts to establish a recycling system in order to further facilitate recycling of end-of-use household appliances.

### Toshiba's commitment

In accordance with the basic policies listed below, Toshiba has established a nationwide network for collection and treatment of end-of-use household appliances. For this purpose, Toshiba has designated sites for collection and set up recycling facilities.

- (1) Compliance with laws
- (2) System acceptable to society
- (3) Minimization of cost

Toshiba is promoting development of recycling technology as well as designing of products with lower environmental impacts.

Term Corp., a subsidiary which conducts recycling, and Toshiba Corp.'s product design operation are jointly developing processing technology. For this purpose, various data are being gathered, such as the time required for dismantling and separation for each product and the amount of parts and materials collected and their quality.

The graphs below show material compositions of Toshiba's four major household appliances. Materials used

and their compositions vary from product to product. In recycling, it is necessary to realize precise separation of various materials. Toshiba has been conducting R&D to achieve this.

Facilities for recycling of household appliances were set up to achieve practical application of the developed recycling technologies and verification of new technologies.

### Facilities for recycling of household appliances

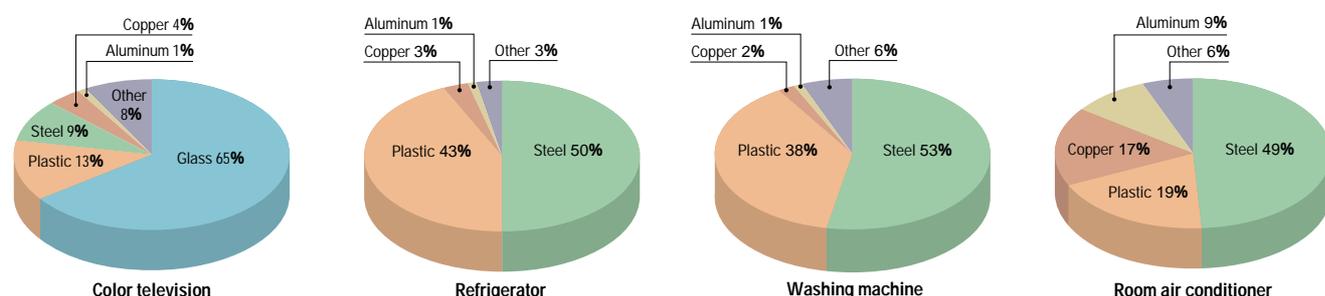
The facilities for recycling household appliances are at Nishi Nihon Consumer Electronics Recycle Co., Ltd., an affiliate, located at the Comprehensive Environmental Complex in Kita-Kyushu which was built in connection with the Eco Town project.

Using the facilities, efficient and proper processing of end-of-use televisions, refrigerators, washing machines and air conditioners will be conducted and verification tests for new processing technologies will be performed. High recycle rate and flexible processing are achieved by optimum combination of manual dismantling, mechanical crushing and use of separators. Total floor area of the facilities is about 6,200m<sup>2</sup> and processing capacity is about 500,000 units (total for the four products) per year. Full-scale operation is scheduled to begin in April 2001.

### Commitment to development of next-generation recycling technology

In order to facilitate the establishment of a recycling society, Toshiba is developing technologies for processing

Material composition of Toshiba household appliances (products manufactured from 1990-1995)



items which are difficult to process using conventional technologies. Toshiba's efforts are by no means limited to the four products which are subject to the Household Appliances Recycling Law. Indeed, in line with its commitment and proactive approach to recycling, Toshiba is forging ahead with the development of processing technologies and enhancement of recycle rates for various other products.

Technologies being developed include those for recycling of plastics used for the main units of products, processing of urethane used for insulation of refrigerators, processing of lithium-ion re-chargeable batteries, and processing of printed circuit boards.

The development of these technologies is being promoted on a cooperative basis by Toshiba Corp.'s Research & Development Center, product design operations and Term Corp.

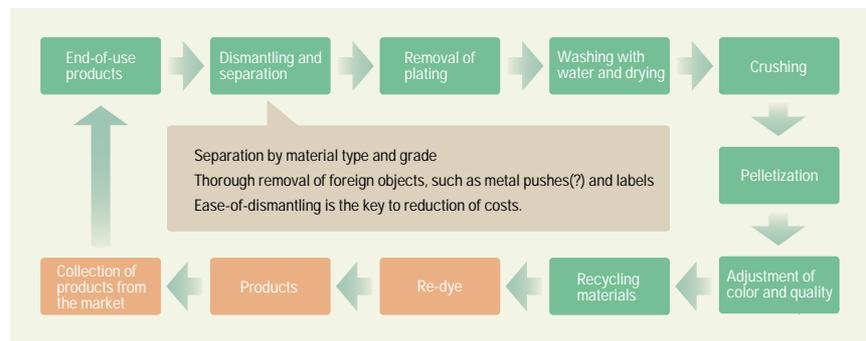
Here, as an example of Toshiba's efforts, a technology for recycling of plastics used in the main units of personal computers is presented. The main units of PCs account for the use of a large quantity of plastics and the extent to which these plastics are recycled has a great influence on the improvement of the overall recycle rate. First, plastics are dismantled and separated from PC main units and foreign objects, such as metal bushes and labels, are removed. Then,

following removal of plating, and washing and crushing processes, recycled pellets are produced. These pellets are mixed with new raw pellets for use.

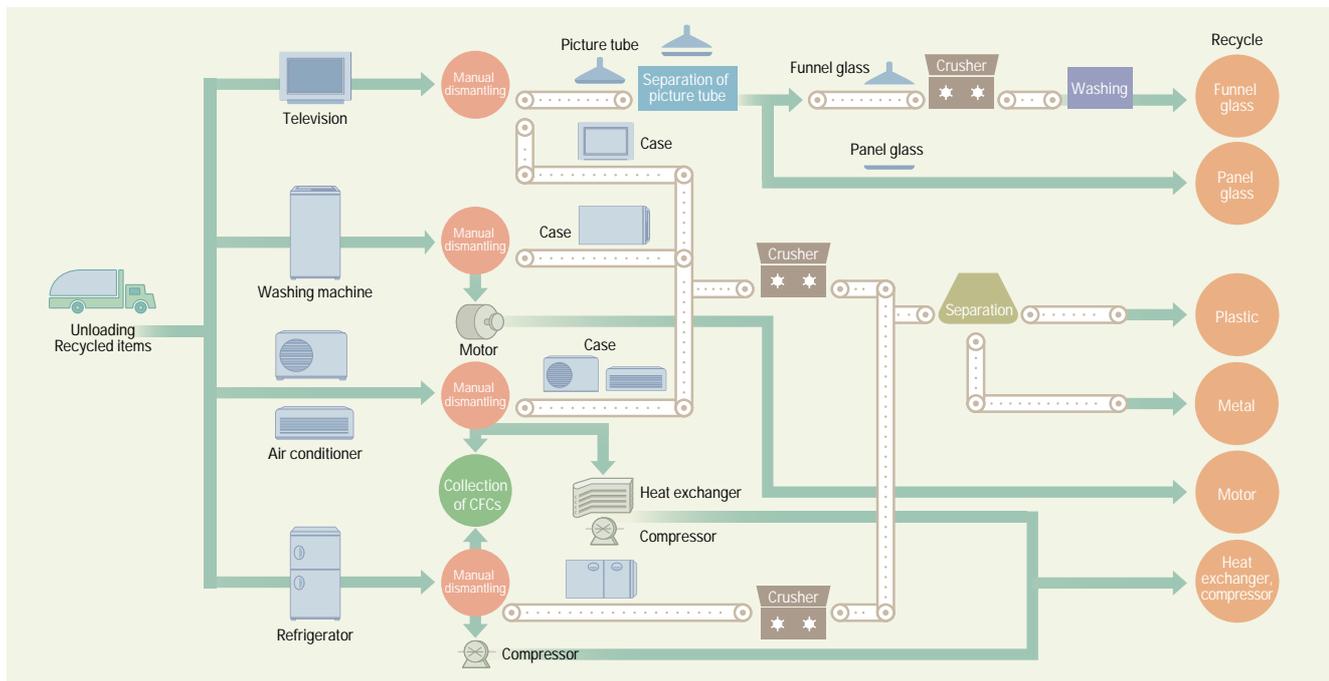
Thanks to the development of these processing technologies and reliability technologies, a high recycle rate is attainable.

As part of the drive to establish a recycling society, it is essential to develop a network for collection and processing and to develop recycling technologies. Toshiba's efforts to respond to these needs are underpinned by close cooperation among the operations concerned.

Process chart for recycling of plastics used for PCs



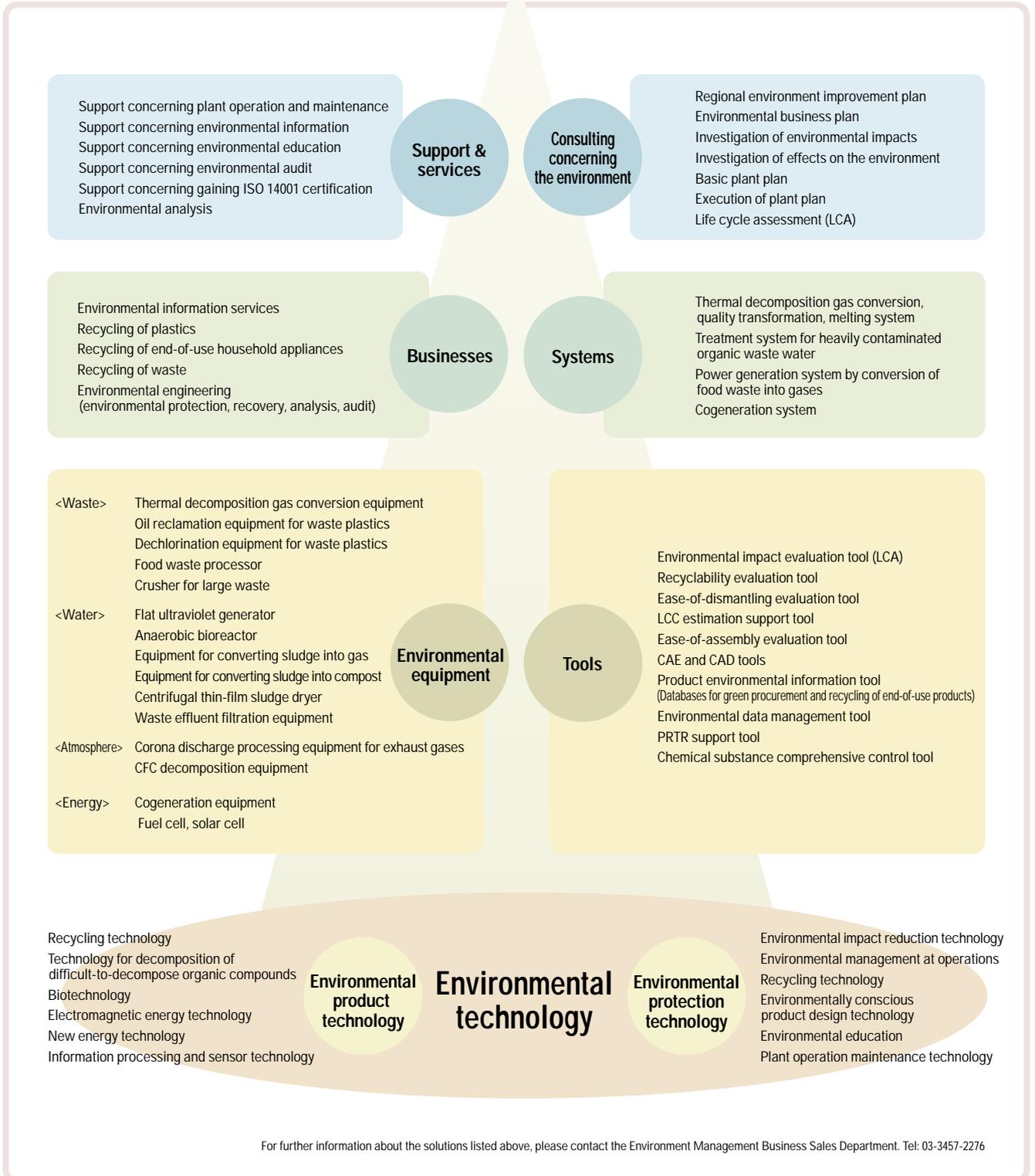
Process chart for recycling at Nishi Nihon Consumer Electronics Recycle Co., Ltd.



# Total solutions for the environment

At the dawn of the 21st century, it is incumbent on humankind to address the problem of global warming, exercise responsibility in the use of limited resources, and deal with various other issues. Based on the recognition that the Earth's environment is under threat, Toshiba is committed to doing its utmost to protect the environment. It is Toshiba's earnest desire to contribute to society through reduction of the environmental impacts of production activities, development of environmentally conscious products and recycling technologies that reflect its expertise as a manufacturer, use and disposal of products, systems engineering, construction of environmental plants and involvement in environment-related businesses.

## Toshiba's total solution for the environment



For further information about the solutions listed above, please contact the Environment Management Business Sales Department. Tel: 03-3457-2276

**Thermal decomposition gas conversion system for quality transformation and melting**

<Utilization of organic substances in a new form>

Thermal decomposition furnace  
Heat exchanger  
Desulfurization equipment  
Melting furnace  
Gas quality transformation equipment  
Gas cleaning equipment  
Water treatment equipment  
Gas engine generator

Magnetic separation technology  
Carbonization gas conversion technology  
Waste power generation technology  
Plant engineering  
Crushing, separation and classification technology  
Process sensor technology  
Concept engineering  
Plant monitoring control

With this system, dioxin is within the limit stipulated by the environmental regulations and substances with value contained in residue are collected as resources for reuse.



**Treatment system for heavily contaminated organic waste water**

<Efficient treatment of water using biotechnology>

Anaerobic bioreactor  
Deodorizer  
Power generator  
Sludge treatment equipment  
Gas boiler

Technology for utilization of anaerobic bacteria  
Oil and solid removal technology  
Plant monitoring control  
Stripping technology  
Solid and liquid separation technology  
Power generation technology

Toshiba developed a methane fermentation bioreactor for treatment of heavily contaminated waste water containing high concentrations of organic effluent for food processors.



**Food waste gas conversion power generation system  
Sludge gas fuel cell power generation system**

<Conversion of food waste and sludge into energy>

Food waste liquefaction equipment  
Waste water treatment equipment  
Power generation facilities (fuel cell, gas engine, etc.)  
Biogas conversion facilities

Technology for utilization of anaerobic bacteria  
Plant engineering  
Cogeneration technology  
Power generation technology  
Plant monitoring control  
Remote sensing technology  
Fuel cell technology

Food waste and drain sludge, which previously were incinerated or disposed of by landfill, are converted into biogases for use in fuel-cell power generation to produce electricity and heat.



**Sapporo Plastic Recycling Co., Ltd.**

<Oil reclamation from waste plastics>

Thermal decomposition furnace  
Melting tank  
Exhaust gas combustion tower  
Dechlorination equipment  
Decomposition tank  
Gas scrubber

Dechlorination technology  
Oil reclamation technology  
Thermal decomposition technology  
Monitoring technology  
Process sensor technology  
Remote sensing technology

In order to promote recycling of waste plastics, which previously were incinerated or disposed of by landfill, reclamation of oil from plastics has started on a commercial basis.



**Environmental consulting services**

<Toshiba technologies are brought into full play>

Various tools (environmental impact evaluation, recyclability evaluation, ease-of dismantling evaluation, LCC estimation support, ease-of assembly evaluation, CAE, CAD, product environmental information, environmental data control, PRTR support, chemical substance comprehensive control)

Environmental impact reduction technology  
Recycling technology  
Design technology  
Environmental management at operations  
Environmentally conscious products

To help realize a recycling society, Toshiba utilizes its expertise in the provision of consulting services regarding environment-related themes.



**Cogeneration system**

<Environmentally-friendly energy system>

Gas turbine                      Gas engine  
Diesel engine                      Fuel cell  
Ice heat storage                      Exhaust gas boiler  
Heat exchanger

Gas turbine technology  
Fuel cell technology  
Plant monitoring control  
Plant engineering  
Gas engine technology  
Ice heat storage technology  
Concept engineering

Cogeneration systems promote energy saving and achieve reduction in generation of CO<sub>2</sub> by effective utilization of electricity and heat.



# Environmental measures concerning logistics

## Activities to reduce environmental impacts of transport and distribution

The focus of Toshiba Group's activities to reduce environmental impacts of transport and distribution is reduction in the number of vans and trucks it uses.

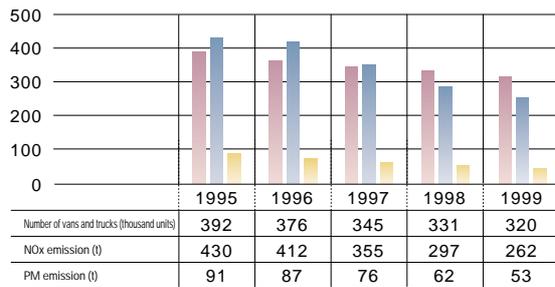
Toshiba Logistics Corp., a subsidiary, is promoting the following measures to reduce the use of vans and trucks, including both those it owns and those of other companies used under contract.

- 1) Optimization of the number of vans and trucks by revising local distribution routes
- 2) Expansion of joint distribution with other transportation companies to enhance loading efficiency
- 3) Reduction in the number of vans and trucks for secondary distribution by a reduction in the number of distribution bases through integration
- 4) Reduction in the number of vans and trucks by expanding periodic round-trip operations for long-distance transport between distribution centers
- 5) Expansion of round-trip operation of vehicles that do not ply a fixed route, based on sharing of information on demands for freight and vehicles through introduction of the Vehicle Information Bulletin Board System for transport between distribution centers.

As shown in the graph, the above measures resulted in 18% reduction in the number of vans and trucks, 39% reduction in emission of NOx and 42% reduction in emission of PM (particle materials) in fiscal 1999 compared with fiscal 1995. Additionally, modal shift, such as utilization of rail transport, which is a clean means of transport, is also being promoted.

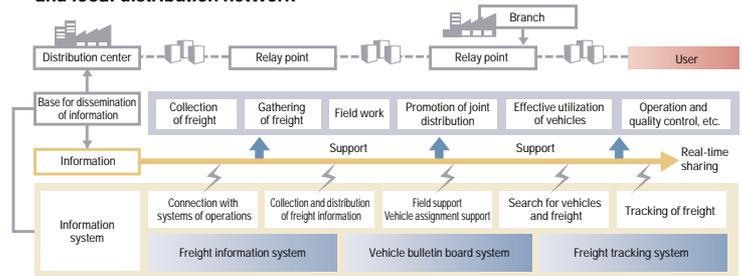
As part of its efforts to be a good corporate citizen, Toshiba Group will continue systematic promotion of measures to reduce exhaust gas generated by vehicles so as to contribute to the prevention of global warming and air pollution.

Number of vans and trucks and emissions of NOx and PM



\* Toshiba Group's environmental impacts described in pages 8 to 9 include the impact of logistics.

Freight and vehicle information system to support trunk line and local distribution network



## Response to environmental packaging

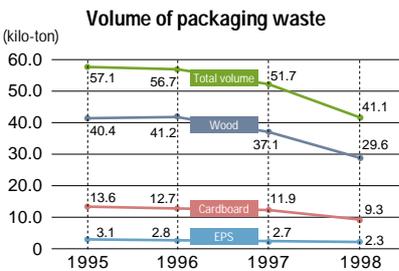
To ensure compliance with laws and regulations and to achieve the targets of the Toshiba Voluntary Plan, Toshiba developed techniques for determining product robustness and evaluating packaging. These techniques are being applied to achieve a great reduction of waste packaging materials.

31% reduction in wooden materials and 28% reduction in EPS were achieved in fiscal 1998 compared with fiscal 1995.

Although achievement of the target, i.e. 50% reduction of styrofoam packaging, may impose additional costs, Toshiba is according priority to environmental friendliness.

for repeated use, thereby achieving zero emission of packaging waste and halving of delivery expenses.

- 2) Recycling: Packaging of hard disk drives was changed from urethane foam to recycled PP material.
- 3) Reduction: Packaging of washing machines was changed to cap packaging, resulting in 37% reduction in use of packaging materials.



As shown in the graph, the volume of packaging waste is on a downward trend, and 27% reduction in cardboard,

The 3R (reduction, reuse and recycling) concept is the basis of Toshiba's efforts to achieve environmental-friendly packaging.

- 1) Reuse: Packaging of copiers for the Japanese market was changed from cardboard for one-time use to containers



Toshiba will continue its efforts to achieve the optimum packaging from the viewpoint of environmental impact, cost, quality and recycling.

## Toshiba's Commitment Overseas

In accordance with its Basic Policy on Environmental Protection, Toshiba Group is executing environmental protection activities with the utmost vigor. Moreover, by addressing the items critical to development of business overseas—as identified in the Earth Environment Charter of the Japan Federation of Economic Organizations—each business operation strives to be environmentally conscious, and to act effectively in the light of the actual situation in the country in which it operates.

### Environmental protection activities of overseas subsidiaries

Toshiba Group's Basic Policy on Environmental Protection requires the management of overseas subsidiaries to embrace environmental protection as a primary responsibility. Overseas subsidiaries are establishing their own environmental rules and systems, reflecting the shared goals and convictions of their management teams.

Each in-house company, supported by corporate staff, is responsible for supervising, guiding and supporting the business activities of its overseas subsidiaries. The principles governing the provision of guidance and support on environmental protection activities to factories overseas are as follows:

- Respect the autonomy of subsidiaries
- Encourage local employees to take the initiative
- Respect regional characteristics

From among overseas subsidiaries, based on a consideration of its equity stake and the nature of the business, Toshiba has selected 31 manufacturing operations for intensive guidance and support in order to achieve a far-reaching impact.

Toshiba divides its overseas operations into four regional groupings: the Americas, Europe, Asia and China. Regional Environmental Protection Council meetings in each region facilitate information exchanges and wide adoption of best practices. In Japan, the

Corporate Environmental Protection Deputy Leader, who is the general manager of a corporate staff division, and the Environmental Protection Activity Leaders of in-house companies hold follow-up meetings periodically to grasp the situation of overseas operations. Personnel from in-house companies, together with local employees, carry out environmental inspections at factories overseas. Local employees in charge of environmental protection come to Japan for practical training and guidance designed to assist them in their efforts to improve the environmental performance of their workplaces.

### TRO receives an environmental award from Regensburg (Europe)

Regensburg Operations (TRO) of Toshiba Europe GmbH in Germany, which manufactures personal computers, received an environmental award from the City of Regensburg in 1999. The Environmental Issue and Nature Protection Committee of Regensburg commended TRO's introduction of new packaging for delicate electronic products. Three other organizations were honored: the Bundeswehr for its efforts to clean up the River Witus and creation of allotments, the Hnas-Herman elementary school for its project to protect the European swift, and Rheinhouses GmbH, a machinery manufacturer which set up a waste treatment center.



Commendation at the old city hall, Regensburg

### Zero Release Program (U.S)

The factory in Tennessee of Toshiba

America Consumer Products, Inc. (TACP) which manufactures televisions is committed to the recycling of waste and is vigorously promoting the Zero Release Program. Fluorescent lamps, batteries, picture tubes and ethylene glycol and other chemical substances are recycled.



Zero Release Program

### Environmental protection activities advancing (Asia)

Toshiba Display Devices (Thailand) Co., Ltd. (TDDT), a manufacturer of picture tubes, has been honored by the Thai Ministry of Industry three years running, in recognition of the excellence of its environmental protection activities. In addition to internal environmental auditing, the activities in connection with ISO 14001 are also deeply rooted at TDDT. The company gained ISO 14001 certification in 1998.



Closing of internal environmental audit

## Working with the community for a better environment

With the aim of being an excellent corporate citizen, Toshiba is energetically contributing to society through the voluntary activities of organizations and employees in the fields of environmental protection and nature conservancy.

Explaining Toshiba's commitment to zero emission and recycling



### Environmental Tour

Ome Operations held an Environmental Tour for school children in cooperation with the Bureau of Public Cleansing of Tokyo Metropolitan Government and explained what it is doing to protect the environment.

Growing potatoes using fertilizer made from food waste



### Effective utilization of food waste at operations as fertilizer

At the Manufacturing Engineering Center, employees cultivate potatoes in their time, using fertilizer made from food waste and leaves, thereby facilitating reduction of waste and effective utilization of resources.

Helping Yokkaichi City gain ISO 14001 certification



### Commendation of appreciation from Yokkaichi City

Yokkaichi Operations worked closely with the local government of Yokkaichi City, supporting it in its efforts to gain ISO 14001 certification and with its internal environmental audit. Yokkaichi Operations received a special commendation from the local government.

Collecting recyclable items in the morning



### Volunteer recycling activities

At Mie Operations, employees bring aluminum cans, newspapers, milk cartons and other items from home for recycling. The proceeds from the recycling of these items are donated to homes for the elderly and other welfare facilities.

Participating in a clean-up to refresh the town



### Cleaning up the local area

As a part of their voluntary activities, Toshiba employees periodically clean up parks, streets, stations, bus stops and the areas adjacent to Toshiba operations in cooperation with local communities.

Quizzes and experiments make learning about environmental issues fun



### Activities designed to enhance people's interest in the environment

Toshiba Science Museum is working to enhance people's interest in the environment by introducing environmental issues through quizzes and experiments, and holding seminars during an annual "environmental month".

Contribution to the Green Foundation



### Helping protect forests

Toshiba is active in nature conservancy. Employees plant trees, shrubs, etc., clear weeds, and contribute to the Green Foundation.

Explaining the operation of environmental protection facilities to local people



### Visits to environmental facilities

Yokohama Operations periodically shows local residents around its environmental facilities and explains what it is doing to protect the environment.

Experiments regarding rapid bus services for commuters



### Experiments on reduction of exhaust gas from automobiles

In cooperation with the local government and other companies in the neighborhood, Hamakawasaki Operations took part in experiments regarding rapid bus services for commuters in order to reduce exhaust emissions by easing traffic congestion in the morning and evening.

# Final remarks

## Working to make the environmental report as useful as possible

### Environmental communication

Toshiba has been enhancing its environmental protection activities on a continuous basis. From now on, Toshiba intends to step up environmental activities and disclosure of environment-related information through various media in order to communicate Toshiba's attitudes and activities.

In environmental communications, Toshiba will place increasing emphasis on sustainable development of activities and business operations. The Environment Technology Exhibition held in March 2000, the ninth such exhibition held by Toshiba, was attended by about 1,700 people, including journalists. The next Environment Exhibition will be open to the general public. The environment bulletin board at each Toshiba operations provides an excellent opportunity for disclosure of information to local people.



The ninth Environment Technology Exhibition



Disclosure of environmental information to local people

### Responses from readers

Over a year has passed since the publication of Toshiba Environmental Report 1998 and the opening of the Toshiba Environment Page on the Internet. Since then Toshiba has received about 500 requests via telephone and fax for the report and about 300 inquiries by email. The home page has had more than two million hits. Inquiries have been received from the mass media, governmental organizations, other companies in the same business field, universities, etc., but the degree of interest has been highest among individuals and NGOs and NPOs. We received many favorable comments, for example, positively evaluating Toshiba's disclosure of the amounts of chemical substances released, and also several helpful suggestions.

Toshiba Environmental Report 1998 received a commendation for excellence in the Environmental Report Awards sponsored by Toyo Keizai Shimpo Co., Ltd. and Green Reporting Forum.



Toshiba Environmental Report 1998



Toshiba Website  
Environment Page

### Editorial comment

In designing and editing the environmental report, communication with customers, shareholders, investors and other stakeholders will play an increasingly important role. We utilized the six sigma approach in creating Toshiba Environmental Report 2000. Based on the "voice of customers", we aimed to achieve a report which caters to the needs of readers.

The key themes of Toshiba Environmental Report 2000 are sustainability and group-wide activities. Detailed data on environmental impacts are disclosed and new activities of Toshiba Group, such as environmental accounting, are introduced to satisfy the diverse needs of readers. On the other hand, 1) detailed descriptions may sometimes resulted in prolixity and 2) although we sought to cover activities of Toshiba Group in the report, in the case of some items (prevention of global warming, control of chemical substances and zero emission of waste, etc.) data and activities of Toshiba Corp. alone are provided to ensure continuity of data. This may be a source of confusion to some readers.

We appreciate your comments on our efforts to achieve a better report. The next environmental report is scheduled to be published in July 2001.



Commendation for excellence in the Environmental Report Awards

## History of Toshiba's environmental commitment

Toshiba has developed its anti-pollution activities step by step and put in place an organization to systematize and direct environmental protection activities. Thus, the scope and effectiveness of Toshiba's environmental protection activities have been progressively enhanced. In April 1988, Toshiba established the corporate-level Environmental Protection Center. In January 1989, the Environmental Basic Rules were introduced, in accordance with which organizations devoted to environmental protection were set up in all business groups and factories, staff were appointed to work full-time for environmental protection, and new activities launched. In November 1989, the Environmental Engineering Laboratory was established within the R&D Center to construct databases on materials, and to develop CFC and trichloroethane-free cleaning

technology, analysis and evaluation technology, and disposal and recycling technology.

In April 1990, Toshiba formally embraced protection of the Earth's environment as one of management's top priorities. At the same time, Toshiba Group adopted the slogan "Committed to People, Committed to the Future. Toshiba", and, in the Basic Commitment of the Toshiba Group, declared its resolve to improve the Earth's environment and contribute to society as a good corporate citizen.

In April 1991, Toshiba set up the Corporate Environmental Protection Council, Toshiba Group's top organization for deliberation and decision-making on environmental matters. The council considers and promotes environmental measures

covering management, technological development, production and sales.

In 1993 Toshiba introduced the Environmental Audit System in Toshiba on the Basis of Eco-Responsibility (EASTER), a reworking of the in-house audit system.

In April 1997 Toshiba carried out a major revision of its Environmental Basic Rules. By July 1997, all Toshiba operations in Japan had gained the ISO 14001 certification.

In February 1999, Toshiba published its first environmental report. In March 2000, the Mid-term Environmental Plan and the Third Voluntary Environmental Plan were drawn up and announced. In April 2000, environmental accounting of Toshiba Group was done for the first time and the results were announced

### History of Toshiba's environmental protection activities



## Scope of Toshiba Environmental Report 2000

This report includes activities of Toshiba Corp. and its subsidiaries and affiliates listed below:

Toshiba Electronic Systems Co., Ltd.	Toshiba Shomei Precision Corp.
Tokyo Electronic Industry Co., Ltd.	Wako Electric Co., Ltd.
Kawamata Seiki Co., Ltd.	Toshiba TEC Corp.
Toshiba Akita Socio Products Co., Ltd.	Fujiken Co., Ltd.
Toshiba Logistic Support Corp.	Tosei Denki Co., Ltd.
Toshiba Control System Corp.	TEC Izu Electronic Co., Ltd.
Toshiba Personal Computer System Ltd.	Toshiba Carrier Corp.
Toshiba Computer Technology Co., Ltd.	Toshiba Carrier Products Corp.
Toshiba Multimedia Devices Co., Ltd.	Shibaura Mechatronics Corp.
Toshiba Visual-Equipment Corp.	Shibaura NIDEC Corp.
Kitashiba Electric Co., Ltd.	Toshiba Chemical Corp.
Iwate Toshiba Electronics Co., Ltd.	Toshiba Ballotini Co., Ltd.
Kaga Toshiba Electronics Co., Ltd.	Toshiba Logistics Corp.
Fukuoka Toshiba Corp.	(Above-listed 45 domestic affiliated companies)
Toshiba Components Co., Ltd.	
Kitsuki Toshiba Electronics Corp.	Toshiba Europe GmbH
Takeda Toshiba Electronics Corp.	Dalian Toshiba Television Co., Ltd.
Buzen Toshiba Electronics Corp.	Toshiba Information Equipment (Philippines), Inc.
Hamaoka Toshiba Electronics Corp.	Toshiba Singapore Pte., Ltd.
Yokkaichi Toshiba Electronics Corp.	Toshiba America Information Systems, Inc.
Himeji Toshiba E.P. Corp.	P.T. Toshiba Consumer Products Indonesia
A&T Battery Corp.	Toshiba America Consumer Products, Inc.
Toshiba Hokuto Electronics Corp.	Toshiba Semiconductor (Thailand) Co., Ltd.
Toshiba Metal Parts Co., Ltd.	Toshiba Electronics Malaysia Sdn., Bhd.
Toshiba Battery Co., Ltd.	Toshiba Semiconductor GmbH
Toshiba Medical Manufacturing Co., Ltd.	Wuxi Huazhi Semiconductor Co., Ltd.
Nasu Medical Industry Co., Ltd.	Toshiba Consumer Products (Thailand) Co., Ltd.
Toshiba Home Technology Co., Ltd.	Toshiba Dalian Co., Ltd.
Toshiba Electric Appliances Co., Ltd.	Hangzhi Machinery & Electronics Co., Ltd.
Toshiba Elevator Products Corp.	Toshiba Chemical Singapore Pte., Ltd.
Term Corp.	Tochemi Wuxi Electro-Chemical Corp.
Toshiba Lighting & Technology Corp.	(Above-listed 16 overseas affiliated companies)



### Cover illustration

The illustration on the cover alludes to the fellow creatures with whom we share the Earth, and to the water and vegetation that sustain our existence. It symbolizes Toshiba Group's fundamental commitment to environmental protection in the 21st century.

Please address any comments or inquiries you may have on Toshiba Environmental Report 2000 to the following organization:

#### Environmental Protection & Recycling Planning Center

##### Toshiba Corp.

1-1-1 Shibaura, Minato-ku, Tokyo 105-8001, Japan

Tel: 03-3457-2403

Fax: 03-5444-9206

email: [environment@toshiba.co.jp](mailto:environment@toshiba.co.jp)



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Toshiba Environmental Report 2000 is available on the Internet.

URL <http://www.toshiba.co.jp/env/>



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