Toshiba Environmental Report 2002

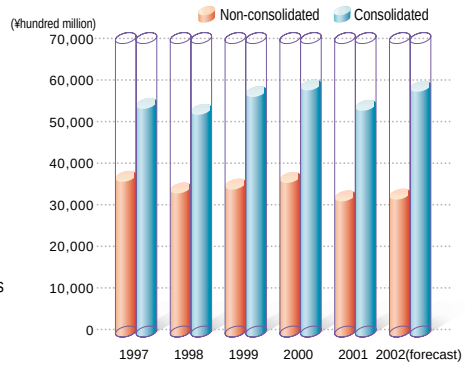
TOSHIBA

Contents

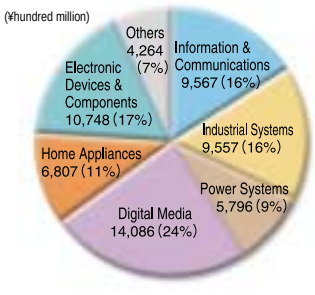
Corporate profile

Company name	Toshiba Corporation
Foundation	July 1875
Establishment	June 25, 1904
Paid-in capital	¥274.9 billion (as of March 31, 2002)
Number of employees	Non-consolidated: 45,649
	Consolidated: 176,398 (as of March 31, 2002)
Group	Number of consolidated subsidiaries: 329
	206 companies in Japan and 123 companies overseas

Net sales



Breakdown of consolidated net sales by segment (fiscal 2001)



Net sales: ¥5,394 billion

* Please refer to the Toshiba Annual Report 2002 for details of Toshiba's business and financial information. The information is also available on the Internet at http://www.toshiba.co.jp/about/ir.

Message

President and Chief Executive Officer

Tadashi Okamura

For the purpose of tackling global environmental issues, it is essential for governments, companies and consumers to cooperate in implementing comprehensive measures from a long-term perspective. Toshiba recognizes that it is humankind's fundamental responsibility to hand on the precious global environment in a sound state to succeeding generations. Furthermore, Toshiba is fully aware that companies have important roles to play in solving environmental problems. Consequently, with a view to achieving sustainable development, Toshiba positions the tackling of global environmental issues as a key management task. Toshiba is resolved to fulfill its social responsibilities by acting as a good corporate citizen in the environmental arena.

In accordance with the Toshiba Group slogan—"Committed to People. Committed to the Future. Toshiba."—at the product development phase, we examine the impact of usage of the contemplated product and how to maximize recyclability and/or ease of disposal when the product reaches the end of its life. Thus, Toshiba Group is working to reduce the environmental impacts of its products throughout their life cycles.

This is the fourth issue of the Toshiba Environmental Report. The scope of the report has been expanded from Toshiba Corp. to Toshiba Group. We have reflected in the report the valuable suggestions solicited from readers of our previous reports as part of our efforts to be a customer-centric, Internet-ready enterprise committed to earning the positive recognition and confidence of all our stakeholders.

To respond to readers' requests, various environmental data of our operations are provided in this report. Also, the structure of the report reflects the flow of our operations, i.e. product development, manufacturing, usage and recycling.

To contribute to the establishment of a recycling-based society, Toshiba is enhancing environmental protection activities on five fronts: effective utilization of resources, prevention of global warming, strengthening control of chemical substances, development of environmentally conscious products and recycling of end-of-life products. At the same time, we are making efforts to enhance the quality of the routine work underpinning those activities.

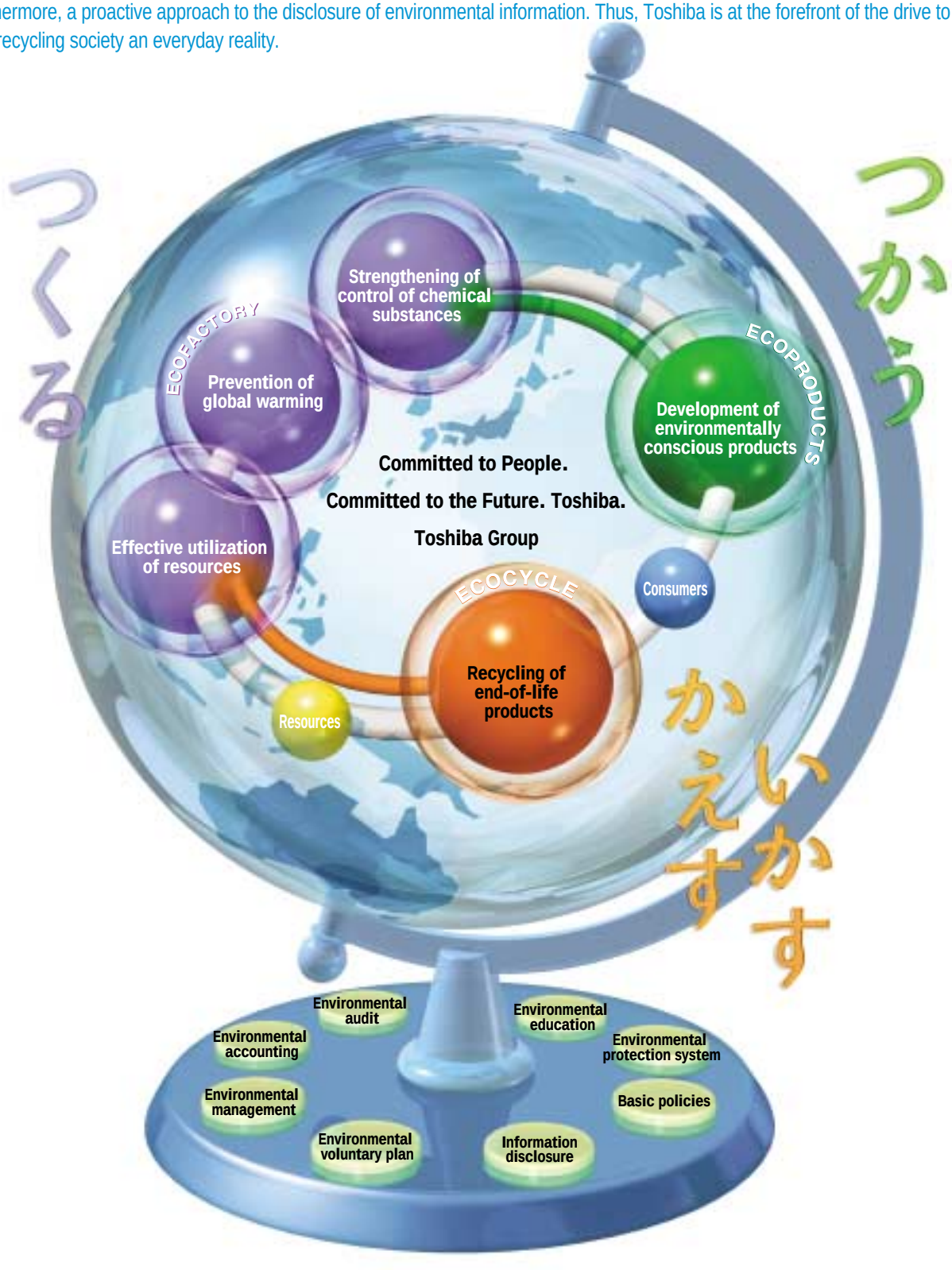
On a continuous basis, Toshiba will disclose information on these activities in environmental reports and at its website. We will be delighted if Toshiba Environmental Report 2002 helps you to arrive at a better understanding of the extent and nature of Toshiba's commitment to the environment. Moreover, we warmly welcome your comments and suggestions.

Foreword

For readers

*This section describes Toshiba's approach to environmental protection activities and explains the editorial policy and topics of Toshiba Environmental Report 2002. It will help you grasp the outline of the report so that you can proceed directly to the details of any subject of interest.

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 the product reaches 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 2002 mainly presents the results of Toshiba Group's environmental protection activities in fiscal 2001. This is the fourth issue of Toshiba Environmental Report. The first issue, Toshiba Environmental Report 1998, was published in February 1999. Of Toshiba Corp's 329 consolidated subsidiaries, the 75 manufacturing subsidiaries listed on the final page of the present report are covered, although the extent of coverage varies. Although the editing of this report reflects the Environmental Reporting Guidelines published by the Ministry of the Environment, Japan, and the GRI Sustainability Reporting Guidelines, these guidelines include certain items that are at variance with the situation in Japan and others that are difficult for us to include in the report considering our current capabilities. It is important that these deficiencies be resolved in future.

Focusing on sustainability, our aim is to identify issues by clarifying the actual situation of environmental impacts through the use of the analytical tool of environmental accounting. Based on the assumption that this report will mainly attract a well-informed readership, we sought to provide detailed and precise information. However, to accommodate the needs of a diverse readership, we have included plenty of illustrations and diagrams so that the outline can be grasped without reading the entire text.

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ECOFACTORY

Prevention of global warming P 18 19

Energy saving in fiscal 2001 was equivalent to 11,243 t-C.
Energy-saving measures at Toshiba Headquarters Building are featured.

Control of chemical substances P 20 21

PRTR data for all operations of Toshiba Corp. and the four core subsidiaries are disclosed.

Zero emission of waste P 22

13 operations achieved zero emission.

Response to soil and ground water issues P 23

In fiscal 2001 approximately 1,400 kg of organochlorine solvent was recovered.

Commitment to PCB P 24 25

Detailed information on storage of PCB and the plan for in-house treatment is presented.
Coverage of PCB is more extensive than in the 2001 report.

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ECOPRODUCTS

Commitment to development of environmentally conscious products P 26 27

The process flow for creation of environmentally conscious products is shown and environmental performance data for products are disclosed.

Energy saving award P 29

Toshiba air conditioners for use in stores won the Director-General's Prize of the Agency of Natural Resources and Energy. This is the eighth award Toshiba air conditioners have garnered.

More information on PCs disclosed P 30

Environmental information on Toshiba PCs is available at dynabook.com.

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ECOCYCLE

Recycling of home appliances P 34

Results are compiled for the year since the Home Appliance Recycling Law came into full force.

Recycling of PCs P 35

Data on recycling of waste personal computers discharged by business users are presented and our activities concerning waste personal computers discharged by consumers are introduced.

Environmental solution P 36 37

Gas treatment equipment using plasma technology is introduced.

CORE ACTIVITIES

Environmental management P 6 7

The proactive stance of the environmental management of Home Appliances Company is presented.

Environmental accounting P 10 11

Environmental costs amounting to 35.7 billion yen (a decrease of 3.3 billion yen from the previous year) resulted in environmental impact reduction benefits worth 36.6 billion yen. Risk prevention benefits were calculated for the first time.

Environmental voluntary plan P 12 13

Implementation of the third voluntary plan started. Good results were achieved in the first year.

Environmental education P 15

Following the introduction in fiscal 2001 of a course designed to help managers cultivate environmental awareness and an introductory course for engineers on environmentally conscious design, e-learning has started for employees at headquarters and branch offices.

Information disclosure P 40 41

As publication of Toshiba Environmental Report attests, Toshiba is committed to a proactive approach concerning disclosure of information on its environmental activities.
Feedback from stakeholders is also included.

Note

Circled Figure indicates the pages concerning the item.

Environmental management

Since the Earth's environment is humankind's life-support system, 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 knowledge 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.

Prevention of global warming

Toshiba Corporation recognizes that the Earth is an irreplaceable asset, and that it is humankind'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.

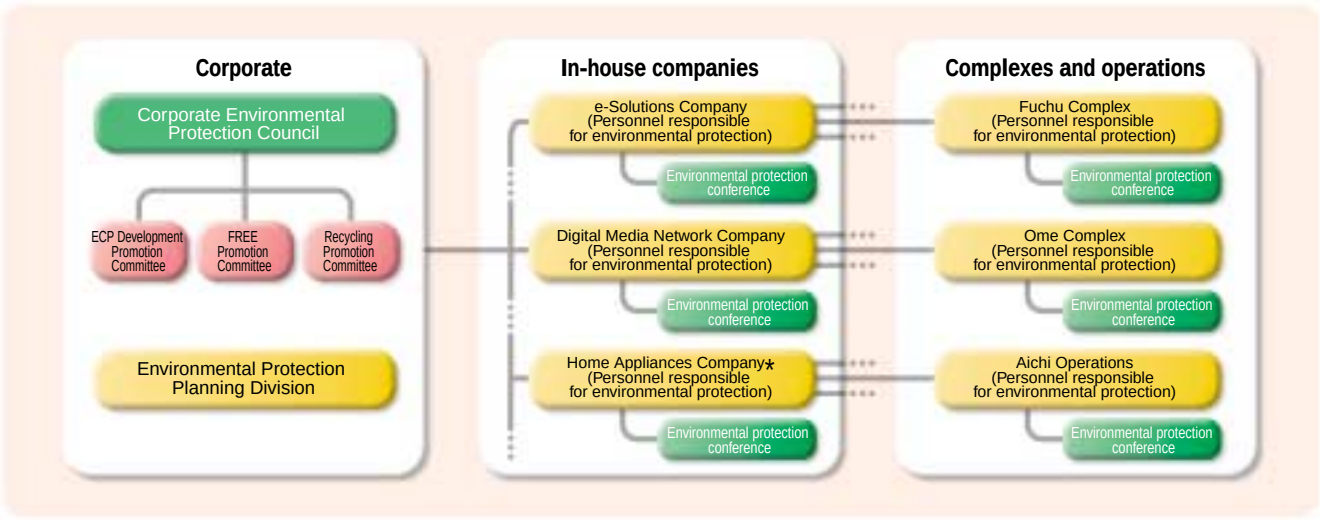
(1) Toshiba considers environmental protection to be one of management's primary responsibilities.
(2) Toshiba specifies objectives and targets for its business activities, products and services respecting the reduction of environmental impacts and prevention of pollution.
(3) Toshiba strives to continuously 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 awareness of all its employees respecting the environment and requires that they make a practical contribution to environmental protection through their work.
(8) Toshiba operates globally, and accordingly, promotes environmental activities throughout Toshiba Group.

Environmental protection system

With the aim of enhancing the commitment to environmental protection throughout Toshiba Group and making it integral to the operation of every Toshiba Group company, Toshiba set up the Corporate Environmental Protection Council in 1991. Chaired by an executive officer responsible for environmental protection throughout Toshiba, the council has a wide-ranging brief: it proposes solutions to environmental problems affecting management, technological development, production and sales, determines basic policies, and reviews the progress of in-house companies and operations.Its subordinate organizations include the Environmentally Conscious Products (ECP) Development Promotion Committee, which promotes development of environmentally conscious products and technologies, the FREE Promotion Committee, which promotes environmental protection at operations, and the Recycling Promotion Committee. Individual in-house companies and operations hold environmental protection conferences at which goals are set and projects launched respecting specific products and regions.

Corporate environmental protection conferences

Organizational chart of the corporate environmental protection system

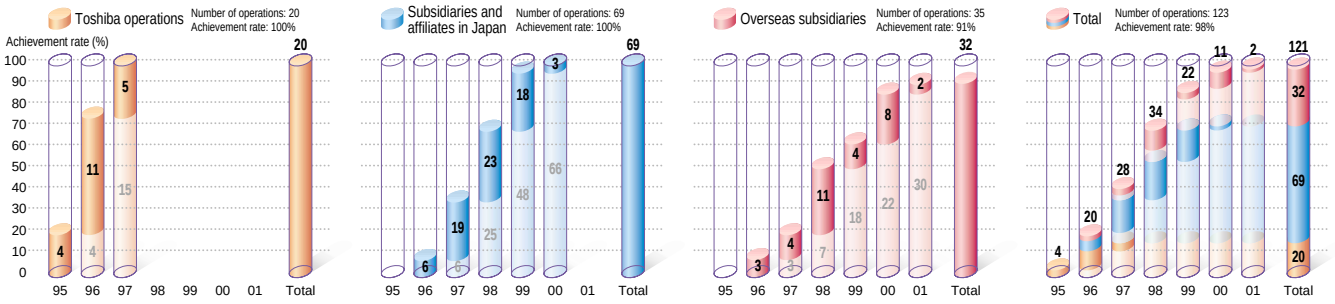


* Home Appliances Company's activities are featured on Pages 6 and 7.

Environmental management system

ISO 14001 certification, the international standard,of 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.
As shown below, Toshiba's commitment to gaining this environmental certification dates back several years. By September 1997 all 20 of Toshiba Corp.'s operations had gained ISO 14001 certification and have maintained that certification ever since. All 69 operations of affiliated companies in Japan have also gained ISO 14001 certification. To date, more than 90% of Toshiba's overseas subsidiaries have gained certification and we are working to achieve certification for all our overseas facilities.

ISO 14001 certification (as of March 31, 2002)



Environmental management of Home Appliances Company

Home Appliances Company of Toshiba Corp. manufactures refrigerators, washing machines, IH rice cookers and other electrical home appliances. With the aim of contributing to the establishment of a recycling-based society, Home Appliances Company is taking into account effective utilization of resources, prevention of global warming, development of environmentally conscious products and recycling. Sophisticated technology is required to reduce environmental impacts throughout product lifecycles. Examples of environmentally conscious products created through continual technological innovation include HFC-free refrigerators that protect the ozone layer, helping to reduce global warming, and energy-saving washing machines that save water and detergent.

Development of environmentally conscious products

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Aiming to create products expressing environmental consciousness

Ken Nagasaka
President of Home Appliances Company Environmental Officer

The importance of environmental protection is growing with every passing year.
Acting in accordance with its well-established environmental policy, Home Appliances Company is contributing to the emergence of a recycling-based society through environmentally friendly manufacturing, introduction of environmentally conscious products and promotion of energy saving.
Conceiving of environmental friendliness from the viewpoint of consumers, we are committed to creating environmentally conscious products of which we can be proud.

Prevention of global warming

Freon-free refrigerator

Water saving

Washing machine/drier

Dish washer/drier

Recycling

Production Supervisory Dept.

We are working to raise the rate of recycling of waste products from the current 50% to 70-80% in the future.
With the aim of achieving zero emission of waste at factories, waste is manually disassembled prior to discharge for recycling, thus reducing the quantity of landfill.

Energy-saving refrigerators and washing machine

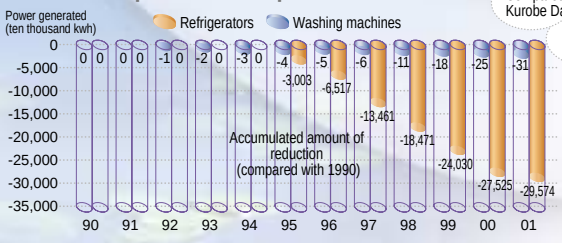
Use of Toshiba's energy-saving refrigerators and washing machines for 10 years saves energy equivalent to half the power generated by Kurobe Dam annually.
Also, the amount of water saved by Toshiba's energy-saving,

Power generated per year: 530 million kWh/year

Compared to the output of Kurobe Dam

Power equivalent t 0.5 of Kurobe Dam

Reduction of power consumption



Saving of power equivalent to about half the power generated by Kurobe Dam
Power generated by Kurobe Dam per year: 530 million kWh/year

- 3R design
- Green procurement
- Energy-saving and resource-saving design
- Reduction of use of substances with significant environmental impacts
- Product assessment
- Lifecycle assessment (LCA)

Efficient use of electricity by 200 V supply

IH electromagnetic cooker

Utilization of resources

Disposer

Reduced use of substances with substantial environmental impacts

Microwave oven

IH rice cooker

Iron

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Products created from the viewpoint of recycling

Design Group, Laundry Engineering Dept.

Based on the 3R concept (reduce, reuse, recycling), we are developing environmentally conscious products through environmental assessment of products and lifecycle assessment (LCA).
Specific bromine-based flame retardants (PBB, PBDE) are not used for product parts and use of vinyl chloride has been reduced.

Environmentally conscious manufacturing

Manufacturing Group, Aichi Operations

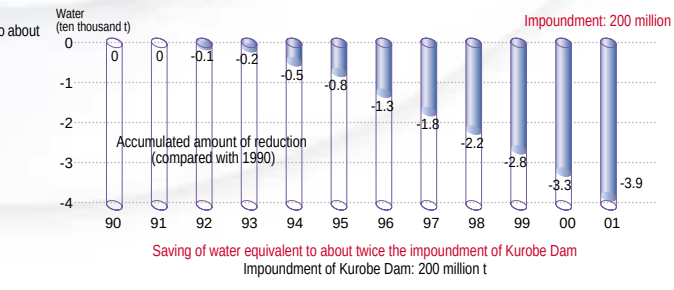
Green procurement of parts and materials is promoted to achieve environmentally conscious manufacturing. Lead-free soldering is adopted for products and use of ozone-layer depleting substances (HCFCs) is reduced. Cardboard made of recycled materials is used, the volume of packaging is reduced, and packaging is simplified.

s save power and water

washing machines over a 10-year period is equivalent to about twice the volume of water impounded by Kurobe Dam.

Kurobe Dam

Reduction of water consumption



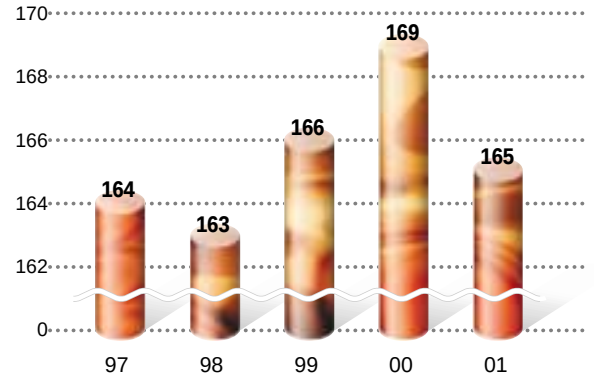
Saving of water equivalent to about twice the impoundment of Kurobe Dam
Impoundment of Kurobe Dam: 200 million t

Toshiba Group's Environmental Impacts

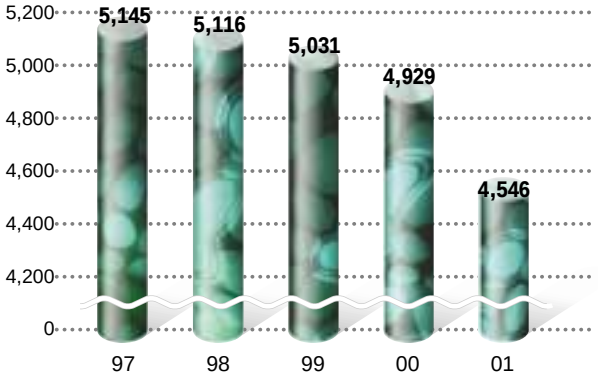
Toshiba Group manufactures and sells a great variety of electronic and electric products ranging from heavy electrical apparatus to consumer electronics, and from information and communications equipment to semiconductors and other electronic components. Among these products, environmental impacts differ 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 the atmosphere and discharge of waste.Toshiba intends to expand collection of data that can be utilized for efforts to reduce the environmental impacts of its activities. These data are significant components of indices of environmental protection benefits in the environmental accounting of Toshiba Group.

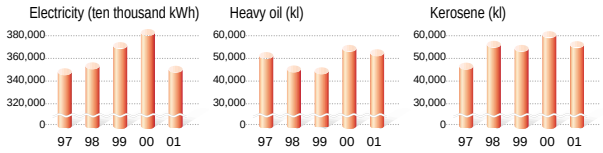
INPUT

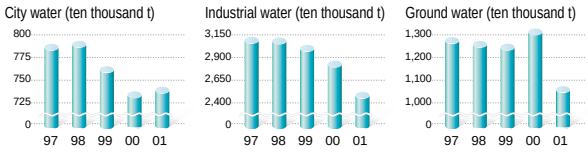
Energy: Calculated in CO2 (ten thousand t)

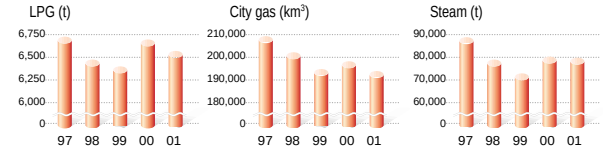


Water (ten thousand t)



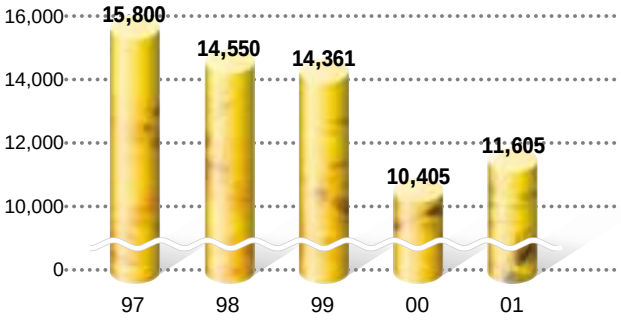




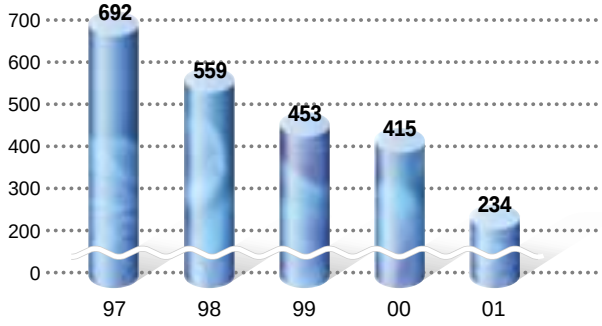


CHEMICAL SUBSTANCES*

Amount used (t)



Release to the environment (t)



* Environmental impact data are tabulated results of Toshiba Corp. and its 75 subsidiaries and affiliates listed at the end of the report.
* Data on chemical substances are data for substances subject to PRTR (refer to pages 42 to 44). Data up to fiscal 1999 are for Toshiba Corp. on a non-consolidated basis for 179 types of substances, and data for fiscal 2000 onward are for Toshiba Corp. and four separated companies (Toshiba Elevator, Toshiba and Building Systems Corp., Toshiba Lighting & Technology Corp., Toshiba Carrier Corp., Toshiba TEC Corp.) for 354 types of substances.
* 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.

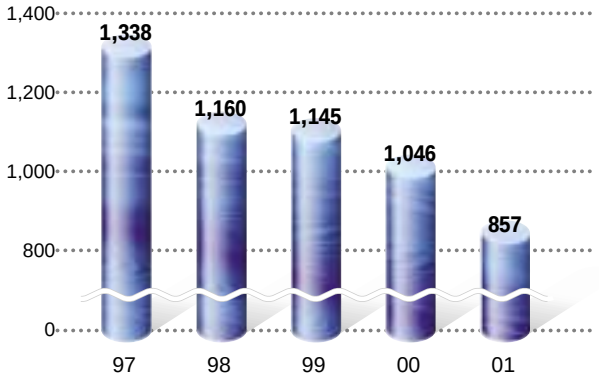
These data constitute the basis of environmental accounting.

Although the great reduction in the environmental impacts in fiscal 2001 compared with the previous year was partly attributable to Toshiba's environmental measures, the principal factor was the reduction in the scale of manufacturing activities during fiscal 2001 due to the weak economy.

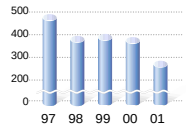
OUTPUT

Water environmental impact (t)

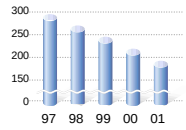
[Annual average value of measured*concentration x total drain discharge for the year]



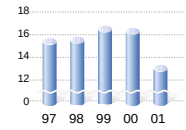
Biochemical oxygen demand [BOD] (t)



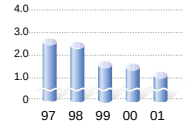
Suspensoid [SS] (t)



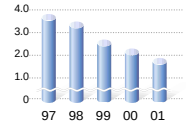
N-hexane extracted substances (t)



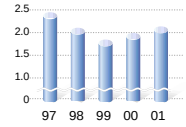
Zinc (t)



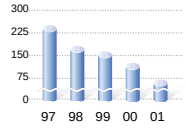
Dissolving iron (t)



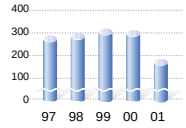
General chromium (t)



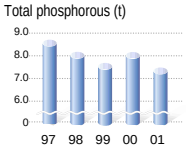
Fluorine (t)



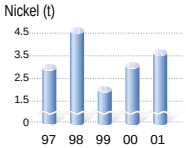
Total nitrogen (t)



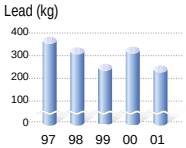
Total phosphorous (t)



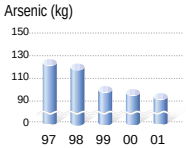
Nickel (t)



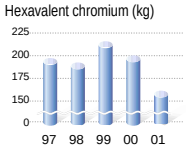
Lead (kg)



Arsenic (kg)

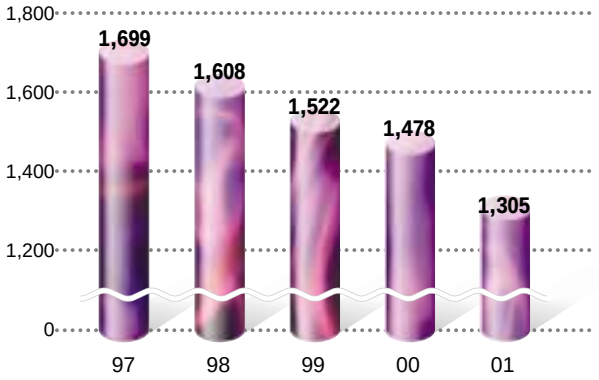


Hexavalent chromium (kg)

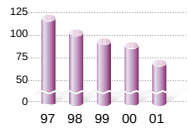


Atmospheric environmental impact

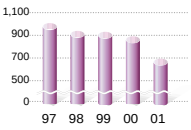
[Annual average value of measured concentration x total gas discharge for the year]



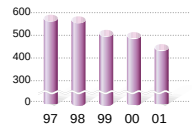
Particles of soot (t)



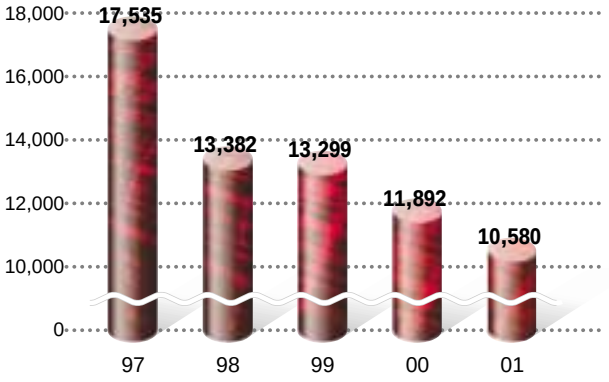
Nitrogen oxide [NOx] (t)



Sulfur oxide [SOx] (t)



Final disposal of waste (t)



Environmental accounting

Costs and benefits

- Aggregated: Toshiba Corp. and 45 domestic subsidiaries and affiliates and 30 overseas subsidiaries
- Period: April 1, 2001-March 31, 2002

Unit: millions of yen

Environmental costs

Classification		Content	Expenditure	Current expenses	Differences
	Business area costs	Reduction of environmental impacts 1)~3)	4,357 (2,787)	13,701 (9,896)	△6,054 (△4,406)
Content	1) Pollution prevention costs	Atmosphere, water, soil, etc.	1,954 (1,193)	7,998 (5,793)	△4,079 (△3,332)
Content	2) Global environmental protection costs	Prevention of the greenhouse effect,etc.	1,741 (1,270)	1,330 (933)	△823 (△478)
Content	3) Resource circulation costs	Effective utilization of resources, etc.	662 (324)	4,373 (3,170)	△1,152 (△596)
	Upstream/downstream costs	Green procurement, recycling, etc.	325 (10)	647 (320)	△216 (△63)
	Management activity costs	Environmental education etc.	214 (14)	4,209 (2,128)	△966 (△607)
	R&D costs	Development of ECP	818 (346)	7,808 (5,162)	△2,701 (△2,362)
	Social activity costs	Disclosure of information, etc.	288 (24)	874 (577)	△184 (△184)
	Environmental damage costs	Recovery from soil pollution, etc.	476 (445)	8,501 (8,457)	6,831 (7,199)
	Total		6,478 (3,626)	35,740 (26,540)	△3,290 (△423)

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

Total expenditure during the period	191,940 (95,580)
Total R&D expenditure during the period	326,170 (270,059)

Basic framework

Classification of environmental costs and the calculation criteria are in accordance with the Environmental Accounting Guidelines Year 2002 edition issued by the Ministry of Environment, Japan, in March 2002. As in Toshiba's previous environmental accounting, the amounts of "investment" and "expenses" are clarified. The principal difference from the previous year's environmental accounting is that "depreciation costs" concerning environmental facilities, which were previously not reported as "expenses", are reported as "expenses". Only expenditure for facilities acquired in fiscal 1999 or later is within the scope of calculation of depreciation costs. Regarding benefits, since no unified standards have been established, environmental impact reduction benefits are indicated quantitatively and also calculated in monetary value in Toshiba's environmental accounting. The table below shows Toshiba Group's classification of benefits. "Actual benefits" are benefits than can be directly converted into monetary value. "Assumed benefits" are the reduction in environmental impacts on the atmosphere, water and soil. In "customer benefits" reduction in power consumption of 20 product lines, including refrigerators, personal computers, copiers and medical equipment, and other economic benefits are evaluated. "Risk prevention benefits," a newly introduced item, are benefits of investment in environmental structures to prevent risks that might otherwise occur in the future.

	Economic benefit items	Environmental impact reduction items
Actual benefits	Environmental impacts clarified quantitatively and easily converted into monetary value	Reduction of electricity Reduction of fuel Reduction of water Reduction of waste (including proceeds from sale of items with value)
Assumed benefits	Environmental impacts clarified quantitatively and converted into monetary value based on certain assumptions	Reduction of environmental impacts on atmosphere Reduction of environmental impacts on water
Customer benefits	Reduction of environmental impacts during use by customers, such as reduction of power consumption, and other economic benefits are calculated.	Reduction of environmental impacts during use of products
Risk prevention benefits	The extent to which risks are reduced after the investment compared with before the investment is calculated	Prevention of environmental risks that might otherwise occur in the future

Basis for calculation of assumed benefits

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

* 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.

Basis for calculation of customer benefits

Benefits of reduction of environmental impacts of products throughout their life cycles are calculated in terms of physical quantity units and monetary units. A life cycle comprises several phases: 1) procurement of raw materials, 2) manufacturing, 3) transport, 4) use, 5) collection, 6) recycling and 7) appropriate processing. Toshiba's environmental accounting focuses on the benefits of reduction of environmental impacts at the use phase. Energy-saving benefits are calculated using the following formula:

Benefits (yen) =

S [(power consumption per year of the former model – power consumption per year of the new model) x number of units sold per year x benchmark unit price of electricity charge]

Basis for calculation of risk prevention benefits

Benefits of investment in environmental structures, such as dikes, for the purpose of preventing pollution of soil and groundwater are evaluated as benefits to prevent risks that might otherwise occur in the future. Risk prevention benefits for each capital investment item are calculated according to the following formula:

Risk prevention benefits =

Quantity of chemical substances stored x Basic amount (monetary value) x Impact coefficient x Occurrence coefficient

where the basic amount and the impact coefficient are those used for assumed benefits and the occurrence coefficient is a value unique to Toshiba.

Unit: millions of yen

Environmental benefits

Classification	Content	Toshiba	Group	Total
Actual benefits	Benefits that can be directly converted into monetary value	2,642	1,140	3,782
Assumed benefits	Benefits concerning reduction in environmental impacts	17,184	9,053	26,237
Customer benefits	Reduction of environmental impacts at the usage phase	2,009	3,040	5,049
Risk prevention benefits	The extent to which risks are reduced after the investment is calculated	860	685	1,545
Total		22,695	13,918	36,613

Breakdown of actual benefits

Item		Environmental impact reduction*	Monetary value of benefits
Energy	Toshiba	47,630kl	¥1.6 billion
	Group	△22,258kl	△¥0.4 billion
	Total	25,372kl	¥1.2 billion
Waste	Toshiba	95t	¥0.7 billion
	Group	1,217t	¥1.5 billion
	Total	1,312t	¥2.2 billion
Water	Toshiba	1,901,691m^3	¥0.3 billion
	Group	1,925,823m^3	¥0.1 billion
	Total	3,827,514m^3	¥0.4 billion
Total			¥3.8 billion

* Indicated in the above table are differences in volumes of environmental impacts between fiscal 2000 and fiscal 2001
* Minus figures indicate that increase in environmental impacts exceeded reduction in benefits.

Breakdown of assumed benefits

Item		Environmental impact reduction*	Monetary value of benefits
Environmental impact reduction benefits at the manufacturing phase	Toshiba	188t	¥17.2 billion
	Group	174t	¥9.1 billion
	Total	362t	¥26.3 billion

* Indicated in the above table are differences in volumes of environmental impacts between fiscal 2000 and fiscal 2001.

Breakdown of customer benefits

Item		Environmental impact reduction*	Monetary value of benefits*
Environmental impact reduction benefits at the usage phase	Toshiba	75,560Mwh	¥2.0 billion
	Group	89,780Mwh	¥3.0 billion
	Total	165,340Mwh	¥5.0 billion

* The principal benefit is reduced power consumption. Also, the benefit of reduced water usage is evaluated.

Figures in parenthesis are in \ hundred million.

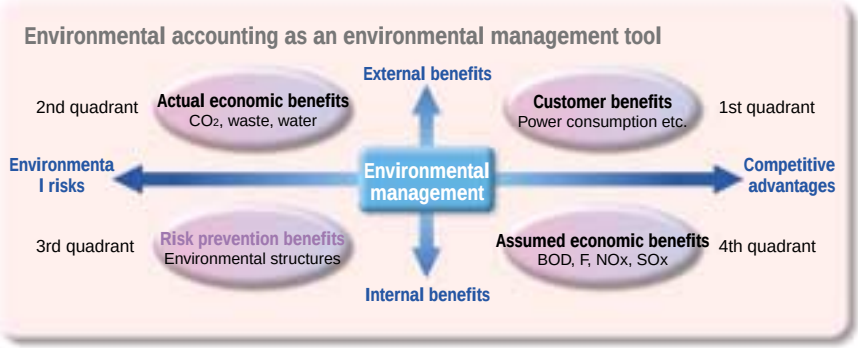
Indicator	Fiscal 1999	Fiscal 2000	Fiscal 2001	Formula
Eco-efficiency	0.508 (191/376)	0.421 (164/390)	0.843 (301/357)	Amount of reduction in environmental impacts / Environmental costs
Eco-effectiveness	33.2 (57,494/1,731)	40.9 (59,514/1,454)	43.3 (53,940/1,246)	Net sales / Total environmental impacts

Tool for environmental management

A good working definition of environmental accounting is that it is a tool used to reflect environmental considerations in decision-making. Thus, environmental accounting underpins environmental management. There are various types of environmental impacts, such as waste and air pollution. Because different standards are used for different types of environmental impacts, it is difficult to quantify the total environmental impact. To facilitate the use of environmental accounting in decision-making, it is desirable to have a common standard for environmental impacts of all types. Environmental issues involve negative externalities. Toshiba is attempting to take negative externalities into account or, at least, clarify them, so as to ensure that decision-making on environmental countermeasures is informed by environmental accounting, and contributes to the reduction of environmental impacts on society.

The figure below indicates the outline of Toshiba's environmental accounting. Toshiba's environmental accounting for fiscal 1999 principally concerned the second and the fourth quadrants. For fiscal 2000, Toshiba calculated the first quadrant, benefits to society. In the environmental accounting for fiscal 2001, risk prevention benefits, which correspond to the third quadrant, were calculated. Benefits of investment in environmental structures for the purpose of preventing pollution of soil and groundwater are evaluated as benefits of preventing risks that might otherwise occur in the future. Toshiba intends to use this indicator in decision-making concerning prioritization of environmental investment projects and investment decisions.

Measurement of benefits is still in its infancy. Toshiba is working to establish a better approach so that measured benefits serve as appropriate indices for environmental management (eco-efficiency, eco-effectiveness, etc.).



Voluntary Action Plan (Voluntary Environmental Plan)

The ultimate objective of all environmental endeavors is to achieve the transformation to an economy and society functioning 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. Central to these endeavors is the formulation of comprehensive voluntary environmental plans (action plans).
Toshiba's third voluntary environmental plan, covering the period from fiscal 2001 to 2005, is now being implemented. The principal themes included in the plan are achievement of zero emission of waste, reduction in release of chemical substances, reduction in release of CO_2, and creation of environmentally conscious products (adoption of lead-free soldering etc.). This new voluntary plan is being promoted throughout Toshiba Group, including affiliated companies.

Zero emission of waste

Through task-force-based activities focused on particular types of waste, reduction of waste at source and thorough reuse and recycling, Toshiba aims to reduce the quantity of final disposal (landfill) to 1% or less of total discharge by fiscal 2003.

Reduction in release of chemical substances

In order to achieve a 30% reduction in fiscal 2005 compared with fiscal 2000 in the quantity of chemical substances released, Toshiba is developing technologies enabling reduction of usage and alternatives and has installed recovery equipment.

Reduction in CO_2 release

The third environmental voluntary plan

	Items	Target
1	Zero emission of waste	Step-by-step implementation and the quantity of final disposal to be 1% or less of total discharge in fiscal 2003
2	Reduce release of chemical substances	30% reduction in fiscal 2005 compared with fiscal 2000
3	Reduce CO_2 release	25% reduction in fiscal 2010 compared with fiscal 1990
4	Green procurement	Set target for fiscal 2005 with fiscal 2000 as a benchmark
5	Provide product information	50% of products to be in compliance with the voluntary environmental standards by fiscal 2005
6	Reduce electricity consumed per product function	30% reduction in fiscal 2005 compared with fiscal 2000
7	Apply lead-free soldering	Application of lead-free soldering to all products by fiscal 2003
8	Abolish HCFCs*	Abolition by December 2004

* 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.

Through optimization of capital expenditure and control, Toshiba aims to achieve a 25% reduction in fiscal 2010 compared with fiscal 1990 in the ratio of CO_2 release to net sales.

Green procurement

A working group has set targets for green procurement for each fiscal year through fiscal 2005, using fiscal 2000 as a benchmark.

Provision of product information

Based on the voluntary environmental standards for products drawn up in fiscal 2000, creation of environmentally conscious products is being promoted. The target is for 20% of all products to be in compliance with the voluntary environmental standards in fiscal 2002, increasing to 50% in fiscal 2005.

Reduction of electricity consumed per product function

Toshiba aims to achieve a 30% reduction in electricity consumed per product function in fiscal 2005 compared with fiscal 2000. For this purpose, design guidelines have been prepared for information equipment and consumer products.

Lead-free soldering and cessation of use of HCFCs

Application of lead-free soldering for the principal consumer electronics products and personal computers started in fiscal 2000 and is being expanded step by step. Toshiba intends to apply lead-free soldering to new models of the principal consumer electronics products in fiscal 2001 and to all products by fiscal 2003. Also, Toshiba aims to cease use of HCFCs by December 2004.

Results for the initial year (fiscal 2001) of the third voluntary environmental plan

Results for the initial year (fiscal 2001) Evaluation	Evaluation
The quantity of final disposal was reduced to 1.1% of total discharge due to promotion of 3R activities	
27% reduction in fiscal 2001 compared with fiscal 2000 mainly due to lower manufacturing output	
7% reduction compared with fiscal 1990 due to improvement in energy efficiency of clean rooms. The target (15% reduction) was not attained.	
Results in fiscal 2000 were analyzed and evaluated as a benchmark in order to establish an index for green procurement. Standards were set and implemented.	
Toshiba Eco-products site was launched at Toshiba's website.(Japanese version only)	
14.7% reduction in fiscal 2001 compared with fiscal 2000	
Lead-free soldering was applied to 18 types of products, including fully automatic washing machines and personal computers, by the end of fiscal 2001.	
Freon-free Optical Plasma Senzoko freezer/ refrigerator that does not use CFC substitutes was introduced.	

Environmental audits

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 have been conducted since 1993.

Review of the audit results

Audit items and evaluation

There are four audit items: environmental management system, control of workplace, degree of achievement of the voluntary plan, and creation of environmentally-conscious products. Quality is evaluated in accordance with audit criteria.

Environmental management system

The environmental management systems of all operations are covered by ISO 14001 certification and a third-party organization examines and monitors those systems in connection with the extension of the certification. Internal auditing of environmental management systems covers all requirements of ISO 14001, including compliance with laws and regulations and emergency preparedness and response.

Auditing of control of workplace

Regarding control of the workplace, as well as inspection and control of systems, training for emergencies is evaluated. Items to be improved and recommendations concerning facilities or operation are identified.

Auditing a workplace (training for emergencies)

Auditing of the degree of achievement of the voluntary plan

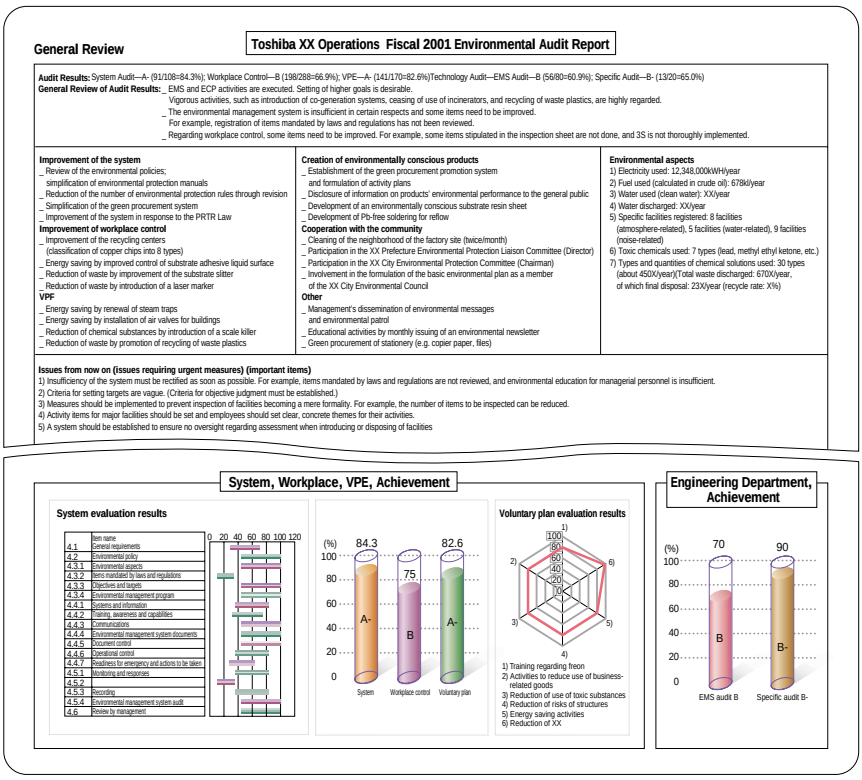
Besides checking the extent to which items of Toshiba Voluntary Environmental Plan, such as energy saving and reduction of waste, have been achieved, the following items are evaluated from the viewpoint of innovativeness and impacts of operations' activities, the degree of participation of personnel, and applicability: improvement of the environmental management system, improvement of control of the workplace, activities to achieve targets of the voluntary plan, and activities to create environmentally conscious products.

Creation of environmentally conscious products

Concerning creation of environmentally conscious products, technology planning and management and the environmental consciousness of engineering sections in terms of both products and technology are evaluated.

Reporting of audit results and improvement plans

An audit team prepares an audit report that includes the results of level evaluation, issues to be addressed and proposals for further improvement, and reports to the personnel responsible for environmental protection at the operations subject to the audit.
After a certain period, a follow-up is executed to monitor progress regarding the operations' implementation of the improvement plan covering urgent and important issues identified by the audit.



Environmental education

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

Education according to position

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. Also, for employees at the headquarters and branch offices, for whom group education may not be the most effective method, e-learning, IT-based remote education, is provided. Specialty education is conducted for internal auditors and specific personnel. Also, education of development and design engineers regarding product assessment and development of environmentally conscious products is conducted.

These various education programs help each employee understand the roles of their workplace and their tasks concerning the environment. As a result of the execution of environmental education, participation of all personnel in continual improvement activities is becoming the norm throughout Toshiba's operations.

Environmental education for managerial personnel

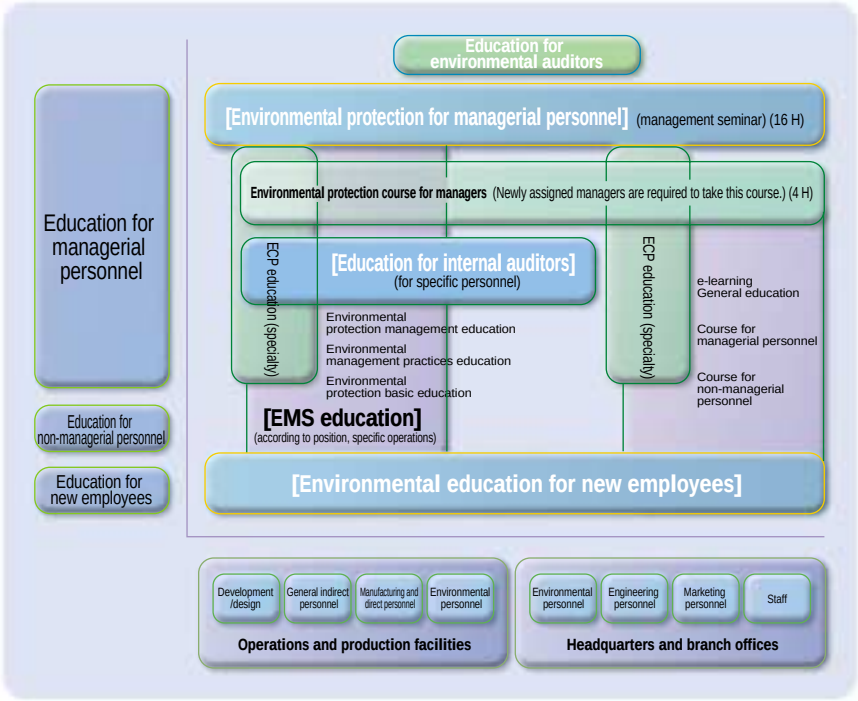
Toshiba has several programs for managerial personnel, covering such topics as resource management, legal compliance, business skills and specialist knowledge, to provide skill development opportunities meeting the diverse needs and characteristics of individual employees. A course designed to cultivate environmental awareness was introduced in 2001. It includes lectures on trends in environmental protection, environmental laws and regulations, environmental issues specific to Toshiba as well as those of a more general nature, and Toshiba's environmental protection activities. In addition, through disassembling personal computers by themselves, participants recognize the importance of ease of disassembling and development and marketing of environmentally conscious products.

Disassembling practice of a personal computer

Environmental education for engineers

An introductory program on environmentally conscious product design is provided for engineers. This program raises designers' awareness of environmental issues and resource constraints so that they will pursue eco-design. Whereas, generally, educational programs on design tend focus on acquisition of practical knowledge, this program focuses on changing attitudes and values. It stresses that environmental friendliness is at the heart of design and offers suggestions on environmentally conscious design and technology development. Participants also learn about LCA, an indispensable design tool for an era marked by increasing emphasis on information disclosure, and a tool which Toshiba is vigorously promoting. In a recycling-based society, it is essential to transform the conventional wisdom of manufacturing. The objective of this program is to foster designers who have a clear development vision and a conviction that the wholehearted embrace of eco-design is essential for success in the marketplace.

Environmental education system chart

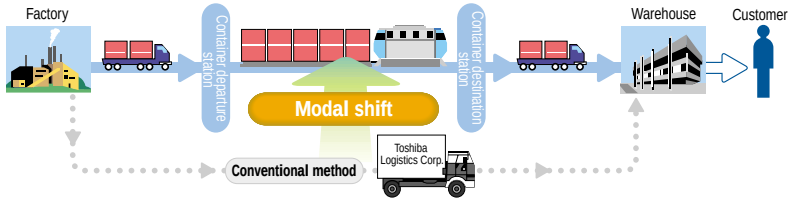


Environmental measures for logistics

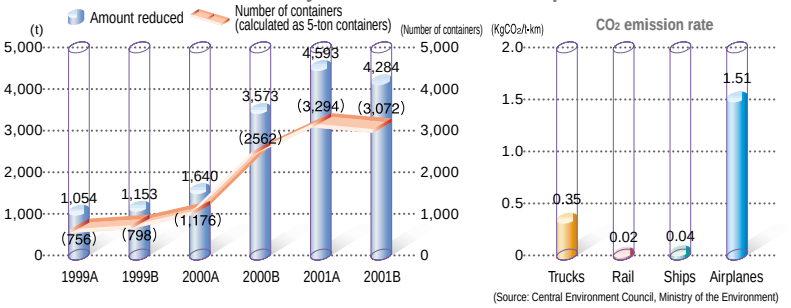
Reduction of environmental impacts of transport and distribution

Toshiba Logistics Corp. is working to reduce the number of vans and trucks it uses to transport products of Toshiba Group and to reduce environmental impacts.
Major activities are described below.
1) Reduction of exhaust from vehicles by modal shift from transport by trucks to railway transport, which has less environmental impact.
2) Reduction in the number of vans and trucks by enhancing loading efficiency through joint distribution with other companies.
3) Reduction in the number of vans and trucks by integration and sharing of freight information among production bases and branch offices throughout Japan.
Regarding modal shift, Toshiba Group used 6,366 JR containers (calculated as 5-ton containers) in fiscal 2001 and reduced CO2 emission by 8,877 tons.

Modal shift model



Reduction of emission of CO_2 by modal shift to rail transport



(Source: Central Environment Council, Ministry of the Environment)

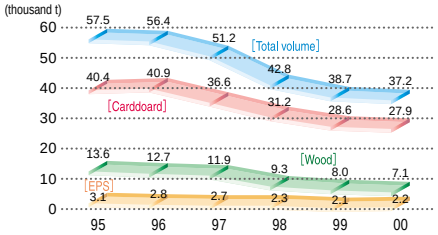
Activities to expand application of rail transport

- Tests of transportation using vibration-absorption-type containers equipped with coil springs at their base are being carried out in order to enable railway transport of precision equipment.
- Expanded use of open containers for heavy items and refrigerated containers for frozen items

Environmental packaging

Toshiba has developed and implemented techniques to optimize packaging and transport so as to achieve a great reduction in wasteful packaging.
As a result of our efforts to reduce the weight of product packaging in accordance with the second Toshiba Voluntary Plan, a 31% reduction in cardboard, a 48% reduction in wooden materials and a 29% reduction in styrofoam were achieved in fiscal 2000 compared with fiscal 1995.

Reduction of discarded packaging materals



Examples of environmental packaging

The lower part of the packaging for PC servers was changed from paper tubes to corrugated cardboard to make classification when discarding easier.

Wooden stands used for large generators, which are extremely heavy items, were changed to steel stands for repeated use so as to reduce the use of wood and waste.

A rivet-less structure and recyclable material were adopted for returnable boxes used between partner companies and factories.

The buffer material for boxes containing 2.5-inch hard disk drives was changed from polypropylene foam to a completely biodegradable material (aliphatic polyester).

Toshiba's Commitment Overseas

Toshiba participates in a recycling event in U.S.A.

Toshiba America Consumer Products, Inc. (TACP) participated in recycling events in California in October 2001 and in Florida in November co-sponsored by mass merchandiser Best Buy Co., Inc. and local government. Thanks to the participation of numerous consumers despite the fact that recycling fees were charged, TVs, VCRs and various other products were recycled. Best Buy appreciated TACP's participation and leadership in these events which met with a very positive response from people in the local communities.

European Environmental Protection Conference

In Europe there is great interest in environmental issues and corporate involvement is correspondingly high. Toshiba held a European Environmental Protection Conference at Toshiba Europe GmbH in Germany in June 2001 to exchange information among subsidiaries of Toshiba Group companies in Europe on environmental issues. Discussion focused on how best to share know-how and contribute to society.

Toshiba Europe uses recyclable energy

The Regensburg factory of Toshiba Europe GmbH in Germany, a manufacturer of personal computers, switched its electricity supplier to ecoSWITCH AG, an enterprise established by 200 companies in Southern Germany to promote the use of recyclable energy. The Regensburg factory buys electricity at a basic rate of 0.12 to 0.25 cents/kwh.

Toshiba Environmental Technology Seminar in Beijing

In China fully-fledged commitment to environmental issues has started in the run-up to the Olympics in 2008 and environmental technologies are becoming a focus of attention. Toshiba held Toshiba Environmental Technology Seminar in Beijing in March 2002. Among those taking part were some 60 people from the PRC State Environmental Protection Administration, academia and business. There were three principal topics: electric-discharge treatment of NOx, dioxin and other exhaust gases, use of hollow fiber membrane to treat large volumes of water, and denitrification systems for wastewater.

Toshiba Dalian commended by Dalian City

The municipal government of Dalian in China presents awards to companies that greatly contribute to environmental protection in the city. Toshiba Dalian Co., Ltd. (TDL), a manufacturer of industrial motors and various components, was commended as an Environmental Protection Model Enterprise in June 2001. Dalian, a major industrial center with a population of 5.3 million, has attracted direct investment from numerous manufacturers from around the world. Only 10 companies have received this commendation. TDL was recognized as a cutting-edge, exemplary environmentally friendly enterprise. The company has been improving its environmental activities on a continuous basis. Since the company's introduction of a new effluent treatment system in 2001, both government officials and local residents have been impressed by the sight of carp swimming in pond water purified by the system.

Toshiba Semiconductor (Thailand) participates in environmental information meeting for companies operating in Thailand

Toshiba Semiconductor (Thailand) Co., Ltd. (TST), a manufacturer of semiconductor devices, has formed an environmental discussion group together with other companies operating in Thailand and is participating in periodic information meetings. TST has presented its environmental activities and Toshiba's internal audits at these meetings. Sharing of information on environmental activities among companies is useful for solving problems in the country and enhancing each company's know-how. TST will continue to contribute to the success of these periodic meetings.

Prevention of global warming

Toshiba is contributing to the prevention of global warming by providing energy-efficient products and systems and by taking action to save energy and reduce CO_2 emissions throughout its operations.

Targets and results regarding reduction of CO_2 emissions at operations

The target for reduction of CO_2 emissions is to achieve 25% improvement in the ratio of CO_2 emissions to net sales by fiscal 2010 compared with fiscal 1990.
The results for fiscal 2001 were an 8% decrease of CO_2 emissions compared with the previous year.
Although CO_2 emissions of the electronic devices operation, which manufactures semiconductors and LCDs, increased 25% compared with fiscal 1990, those of other operations, such as information and industrial systems & services, power systems & services, and home appliances, declined by 33 to 49%. The ratio of CO_2 emissions to net sales of the electronic devices operation improved by 14% compared with fiscal 1990. Thus, efficiency of energy consumption has been improving.

Implementation of energy-saving measures

Management's task is to promote energy saving and CO_2 emission reduction measures from a medium- to long-term perspective, and from the viewpoint of efficiency and disclosure. Toshiba applies a threefold approach in a consistent, well-balanced manner as described below.

(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 efficiency.

(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

Energy saving at clean rooms is promoted by enhancing the efficiency of air-conditioning systems and by adopting manufacturing procedures that use less energy.
These efforts resulted in reduction of CO_2 emissions equivalent to 11,200 t-C in fiscal 2001, which accounted for 4.8% of total CO_2 emissions.

Commitment regarding greenhouse gases other than CO_2

Toshiba uses greenhouse gases other than CO_2. Toshiba's factories in Japan are promoting collection and recycling of these substances and development of substitute substances and technologies in accordance with the voluntary targets for reduction of use.

HFC and HCFC reduction targets and results

		Fiscal 2000	Fiscal 2001
Targets	Reduce use of HFC by promotion of use of substitute substances Eliminate use of HCFC for refrigerators by 2003 and for air conditioners by 2004		
Results	Refrigerators Emission (t/year) Compared with fiscal 2000	4.8 100%	2.5 52%
	Air conditioners Emission (t/year) Compared with fiscal 2000	1.32 100%	1.29 98%

PFC reduction targets and results

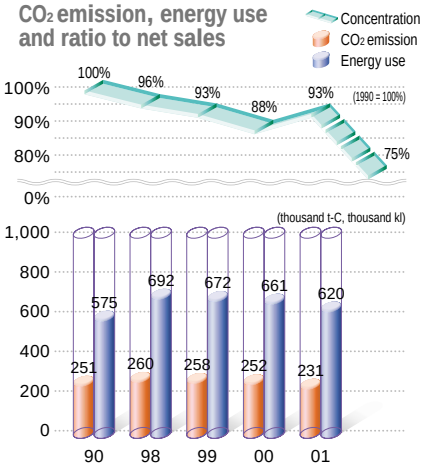
		Fiscal 2000	Fiscal 2001
Targets	Reduce emission of PFC gas by the end of fiscal 2010 to 90% or less of emission in fiscal 1995 Reduce emission of liquid PFC by the end of fiscal 2010 to 30% or less of emission in fiscal 1995		
Results	PFC gas emission (thousand t-CO2/year) Compared with fiscal 1995	854 147%	569 98%
	Liquid PFC emission (thousand t-CO2/year) Compared with fiscal 1995	152 82%	122 66%

SF6 reduction targets and results

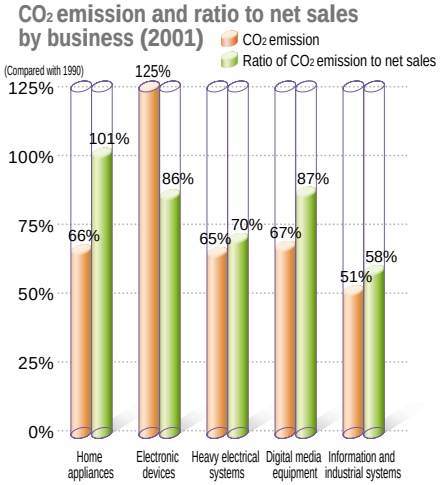
		Fiscal 2000	Fiscal 2001
Targets	Reduce emission rate of SF6 to 3% or less of SF6 purchased		
Results	Purchase (t/year)	60	134
	Emission (t/year)	12	16
	Emission rate	20%	12%

* Data is for Toshiba Corp.'s factories and R&D facilities.
* The following values are used as CO_2 emission coefficients for electricity: 0.102 for 1990, 0.089 for 1997, 0.087 for 1998, and 0.090 for 1999, 2000 and 2001 (unit: kg-C/kWh)

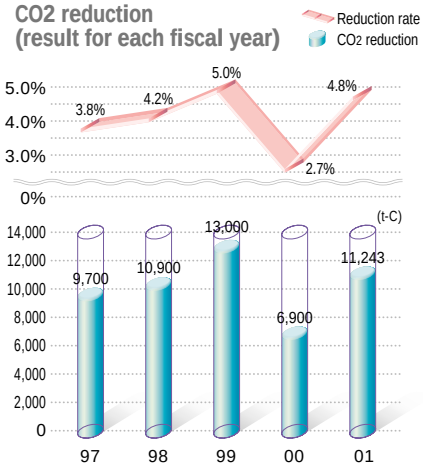
CO_2 emission, energy use and ratio to net sales



CO_2 emission and ratio to net sales by business (2001)



CO2 reduction (result for each fiscal year)



Case studies for energy saving and CO_2 emission reduction measures

To save energy at commercial buildings, such as offices and stores, a building and energy management system (BEMS) has been introduced. BEMS is an IT-based system for efficient use of air conditioners, heat source facilities and various other types of energy equipment. By providing "Comfortable Air Conditioning Control" for buildings, Toshiba contributes to energy saving without compromising comfort and convenience. Toshiba Building Co., Ltd. introduced Comfortable Air Conditioning Control to Toshiba's headquarters building in fiscal 2000, resulting in 17% energy saving in summer and 45% energy saving in spring and autumn. Toshiba Building's implementation of these measures was commended by the Kanto Bureau of Economy, Trade and Industry and Toshiba Building won the Award of the Director-General of the bureau for fiscal 2001.


Toshiba Headquarters Building

The Corporate Manufacturing Engineering Center has established a technique that achieves energy saving of clean rooms without large investment. This technique optimizes operation by assessing and controlling temperature, humidity and ventilation frequency while maintaining cleanness. Measures employing this technique are highly regarded and the Corporate Manufacturing Engineering Center won the President's Prize of the Japan Energy Conservation Center for fiscal 2001.

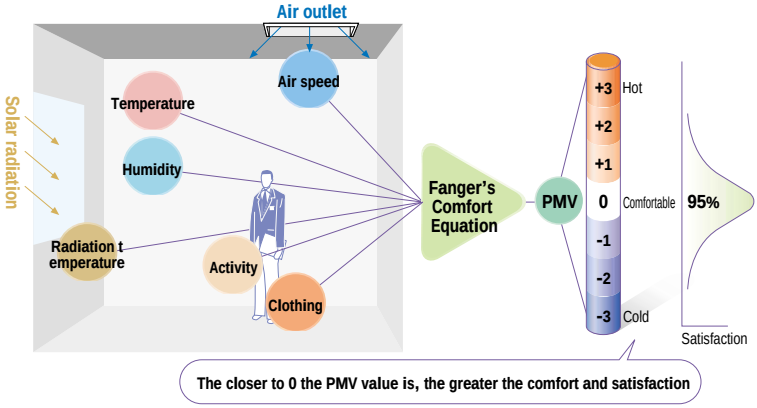
Specialists from Toshiba Plant Kensetsu Co., Ltd., an energy services company (ESCO), perform diagnosis of production facilities etc. from the perspective of energy saving and propose improvement measures. In fiscal 2001 Toshiba Plant Kensetsu conducted diagnosis of four operations in terms of energy saving as collaborative research with other companies.

Toshiba products and services contribute to energy saving. For example, Toshiba commercialized 200 kW phosphate fuel cells for on-site power sources and sold about 250 units of the PC25™ series worldwide through a partner, United Technologies Fuel Cells (UTFC).

Polymer fuel cells are attracting attention for use as power sources for homes and automobiles. Toshiba is developing a 30 kW system for on-site use, a 5 kW system for commercial use, and a 1 kW system for home use. Toshiba's 1kW solid polymer fuel cell for home use is expected to reduce the typical home's CO_2 emissions by 10% and cut annual expenditure on electricity by between 20,000 to 30,000 yen. Toshiba is keen to bring its activities respecting energy saving and the prevention of global warming to the attention of the public. Toshiba's achievements are highly regarded, as attested by the numerous awards Toshiba won in fiscal 2001, including the Award for Excellent Factories for Energy Control and the Award for Excellent Energy Saving Cases.


1kW solid polymer fuel cell for home use

Concept of Comfortable Air Conditioning Control



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
	2000	President's Prize of the Japan Energy Conservation Center	Compressor for air conditioners
		Award of the Director-General of the Agency of Natural Resources and Energy	Air conditioner
	2001	Award of the Director-General of the Agency of Natural Resources and Energy	Air conditioners for commercial use
		Award of the Director-General of the Bureau of Economy, Trade and Industry	Range hood fans
Enterprise Special Commendations	1999	Award of the Director-General of the Agency of Natural Resources and Energy	Toshiba Corp.
New Energy Awards	1997	Award of the Minister of International Trade and Industry	Fuel cell
Excellent Energy Saving Cases	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
	1997	President's Prize of the Japan Energy Conservation Center	Oita Works
	1998	Award of the Minister of International Trade and Industry	Oita Works
	1999	President's Prize of the Japan Energy Conservation Center	Yokkaichi Operations
		President's Prize of the Japan Energy Conservation Center	Iwate Toshiba
	2000	Award of the Director-General of the Agency of Natural Resources and Energy	Iwate Toshiba
		Award of the Director-General of the Bureau of Economy, Trade and Industry	Oita Operations
	2001	President's Prize of the Japan Energy Conservation Center	Corporate Manufacturing Engineering Center
		Japan Energy Conservation Center Prize for Excellence	Oita Operations
Excellent Factories for Energy Control	1994	(Heat) Award of the Director-General of the Bureau of International Trade and Industry	Oita Works
	1998	(Heat) Award of the Director-General of the Agency of Natural Resources and Energy	Oita Works
	1999	(Heat) Award of the Director-General of the Bureau of International Trade and Industry	Yokkaichi Operations
		(Power) Award of the Director-General of the Bureau of International Trade and Industry	Nasu Operations
		(Power) Award of the Director-General of the Bureau of International Trade and Industry	Takeda Toshiba
	2000	(Power) Award of the Director-General of the Bureau of Economy, Trade and Industry	Yokkaichi Operations
	2001	(Power) Award of the Director-General of the Bureau of Economy, Trade and Industry	Fukuoka Toshiba
		(Power) Award of the Director-General of the Bureau of Economy, Trade and Industry	Toshiba Building

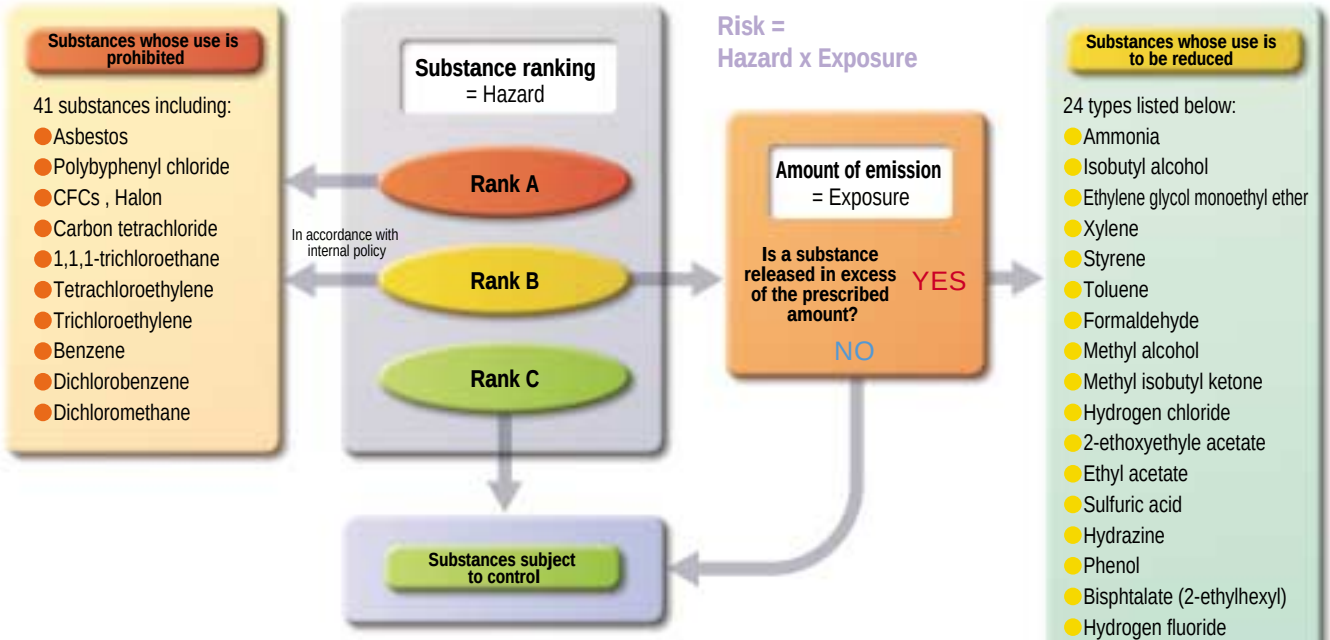
Control of chemical substances

Ranking of substances and release reduction plan

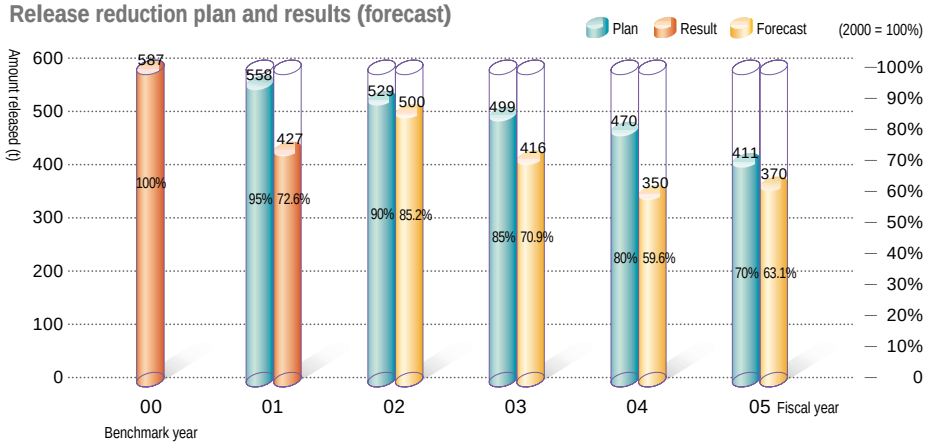
Toshiba's use of chemical substances is based on three fundamental policies: avoid use of toxic substances to the maximum extent possible, promote reduction and substitution to the maximum extent possible, and subject use to appropriate controls. Based on a categorization of chemical substances into three classifications (prohibition of use, reduction in use, control of release), chemical substances are controlled in accordance with the Chemical Substances Control Rules.

Toshiba's concept of control of chemical substances is illustrated in the figure 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 risk associated with the substance. Toshiba adopts a quasi-risk assessment approach in which the risk posed by a substance is expressed as the product of the hazard and the level of exposure. Listed in the table below are chemical substances whose use is prohibited and those whose use is to be reduced. Toshiba does not permit purchase of any substance whose use is prohibited. For substances whose use is to be reduced, Toshiba's target is to achieve a 30% reduction in the amount released in fiscal 2005 compared with fiscal 2000. Furthermore, for substances whose release is to be controlled, Toshiba is conducting appropriate control in accordance with the risks posed.

Concept of control of chemical substances



Release reduction plan and results (forecast)



Toshiba Group's PRTR

The Law Concerning Reporting etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (PRTR Law) enacted in July 1999 provides for introduction of a Pollutants Release and Transfer Register (PRTR) system for promoting the management of chemical substances by businesses. The enforcement ordinance concerning the law promulgated in March 2000 clarifies chemical substances subject to reporting and businesses subject to PRTR. Since April 1, 2002, reporting of the types of chemical substances released and their quantities has been mandatory.

The results for fiscal 2001 were compared with the results for fiscal 2000 (see Page 8 and graphs below).

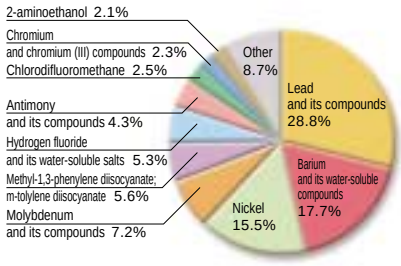
Disclosure and risk communication

For fiscal 2001 the aggregated results for Toshiba Corp. and the four spun-off companies are shown below and PRTR data on individual sites are listed on Pages 42 to 44. Prompted by a conviction that a business enterprise is accountable to society, Toshiba has made data on individual operations available to the public at the Toshiba web site.

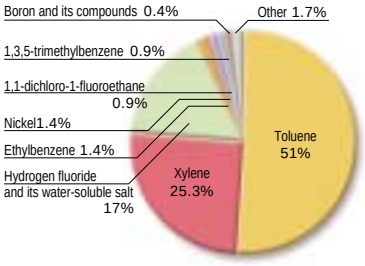
The need for disclosure of information is expected to increase. For example, increasingly, evaluations of companies—made on the basis of data disclosed by the companies themselves—have impacts on companies, either directly or via the mass media. To bring about a situation in which progress in reduction 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 explanations. In this regard, for training purposes mock-up meetings to provide information to local residents are held. Also, through fruitful two-way communication with local residents and local government, Toshiba is seeking a way to rationally prioritize risk reduction measures.

Risk communication

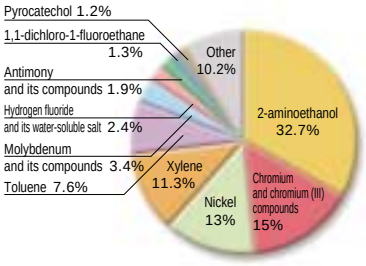
Breakdown by substances subject to PRTR (amounts handled, released, transferred)



Amount handled



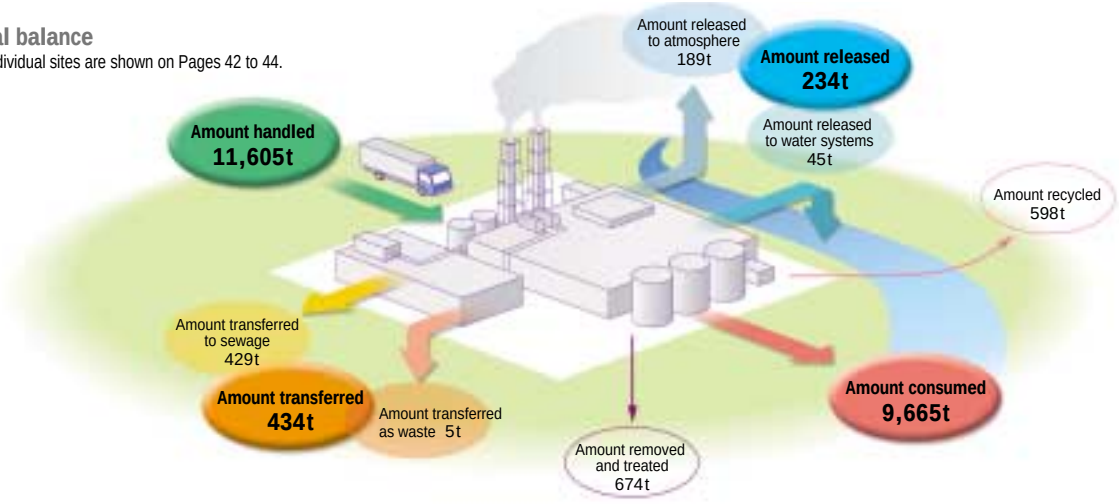
Amount released



Amount transferred

Material balance

Data on individual sites are shown on Pages 42 to 44.



* 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.
* Landfill at operations (stable type, control type, and shield type) is categorized as release. Release to the public sewage system is categorized as transfer.
* The difference between transfer and recycling depends on whether a monetary transaction is involved or not. Therefore, even if the purpose is recycling, if treatment of the substance is contracted out to a third party with charge, the transaction is categorized as transfer of waste.

Zero emission of waste

3Rs of waste

The pursuit of affluence through mass production, mass consumption and mass disposal has resulted in shortage of disposal sites. In particular, it is difficult to open a new disposal site anywhere in Japan for industrial waste discharged by factories or other business operations. Existing disposal sites are estimated to be capable of accommodating a further 190 million tons of industrial waste. They are expected to be full in 3.3 years. It is essential that companies work proactively to reduce waste generation and promote reuse and effective utilization of resources, and thus achieve effective utilization of limited resources and protect the Earth's environment from pollution by waste. At first, Toshiba concentrated on clarifying the volume of each type of waste at business operations and factories. Subsequently, the focus shifted from reduction of waste to reuse and recycling and to avoiding the causes of waste at the source.

To reduce the quantity of final disposal

Toshiba is aiming to achieve zero emission, that is, a final disposal quantity equivalent to 1% or less of the total discharge, based on the new voluntary plan launched in fiscal 2001. As a result of continual activities, 13 operations achieved zero emission in fiscal 2001. The remaining six operations are doing their utmost to reduce total discharge and to expand recycling. Even at the least advanced operations the rate of final disposal quantity to total discharge is less than 4%. It is difficult to adopt a unified approach covering all operations nationwide. For example, in some regions there is simply is no company capable of treating certain types of waste appropriately or waste treatment costs are very high because of transport costs. The corporate-wide working group and task forces in in-house companies exchange information and consider measures.

Thorough classification of waste and establishment of recycling routes

A Semiconductor Company task force has introduced a system of thorough waste classification, promoted frequent exchange of information with waste disposal companies, and conducted case studies. At Oita Operations hydrogen fluoride waste liquid, previously disposed of by landfill after neutralization, is now recycled as sodium silica fluoride. As a result, all factories of Semiconductor Company achieved zero emission. Nasu Operations-Electron Tubes (Tochigi prefecture) established a route for recycling of inorganic sludge, which had been disposed of by landfill, as cement material and a route for recycling of cleaning agent waste as oil fuel. Thus, achievement of zero emission largely depends on the ability to find a way of recycling waste that would otherwise be disposed of by landfill.

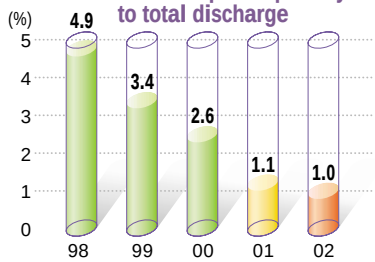
Toshiba is promoting recycling of end-of-use printed circuit boards discharged by a Toshiba subsidiary at Laguna Technopark in the Philippines. Discharged printed circuit boards are imported to Japan in compliance with the Basel Treaty, and a refining company recovers and recycles lead and valuable metals (gold, platinum, etc.). Several Japanese companies with operations at Laguna have joined forces with Toshiba to promote environmental activities. End-of-use fluorescent lamps discharged by these companies are imported to Japan and recycled after treatment of toxic mercury.

Toshiba Group is transferring advanced environmental technology to subsidiaries in developing countries and is working to achieve appropriate treatment and recycling of discharged waste worldwide.

Recycling of waste plastics, previously disposed of by landfill, based on classification of materials
(Landfill → Thermal and material recycling)

Recycling of inorganic sludge previously disposed of by landfill
(Landfill → Material recycling)

Rate of final disposal quantity to total discharge



Response to soil and groundwater pollution

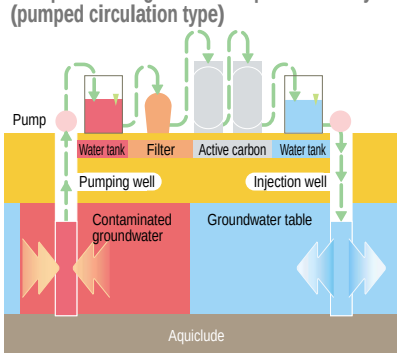
Comprehensive measures in response to organochlorine solvents pollution

Toshiba has conducted a survey of soil and groundwater pollution at its factories. At present, purification of groundwater and monitoring are being done at Fukaya Operations in Saitama prefecture, Komukai Operations and the Microelectronics Center in Kawasaki, Yanagicho Complex in Kawasaki, Toshiba Carrier Corp. (former Fuji Works of Toshiba Corp.) in Shizuoka prefecture, the site of the former Nagoya Branch Works in Nagoya, Osaka Operations in Osaka prefecture, Taishi Area of Himeji Operations in Hyogo prefecture and Oita Operations in Oita. At these eight operations 408 pumping wells are installed. Additionally, 185 observation wells are used to monitor trends at these operations and at the site of the former Nagoya Branch Works*. Organochlorine compounds contained in groundwater pumped up by a pumping well are removed by active carbon adsorption. At the several factories where pumped circulation type purification systems are employed, purified water is returned to groundwater by an injection well. Shown below is a photograph of a pumped circulation type purification system and a figure showing an example system configuration. In fiscal 2001, about 1,350kg of solvents was recovered by pumping up water. Moreover, at three factories, 40 soil gas suction wells are in operation and about 40 kg of solvents was recovered from soil. Concentration of pollutants in groundwater is declining at a moderate pace.

Shown in the graph below are the results (water pumping and soil gas suction) of recovery of organochlorine compounds in the last three years. The amount recovered in fiscal 2001 is less than that in fiscal 2000, since as the concentration of organochlorine compounds contained in groundwater decreases due to purification, the amount recovered for a given quantity of pumped water decreases. Toshiba is raising the efficiency of purification by improving the purification system, for example by concentrating pumping at the most polluted locations.

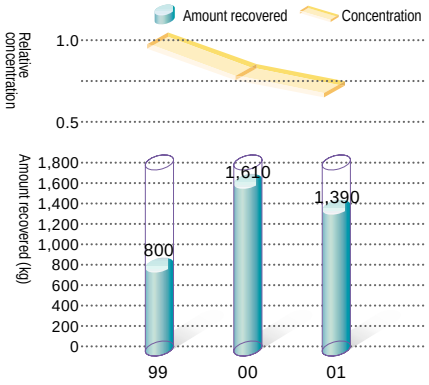
* Chemical decomposition using iron powder is adopted for purification of groundwater at the site of the former Nagoya Branch Works.

Example of configuration of a purification system (pumped circulation type)



External view of a purification system

Results of the amount recovered



Progress at the former Kawasaki Complex

The work to improve the soil quality conducted from February 2001 following the closure of the Kawasaki Complex was completed in March 2002 as scheduled.

* See Toshiba Environmental Report 2001 for results of the investigation of soil and outline of the work.

Efforts to purify soil and groundwater will continue at all operations of Toshiba.

Former Kawasaki Complex after completion of the soil improvement work

PCB (polychlorinated biphenyl)

Storage and control

In July 2001 the law concerning special measures for promotion of appropriate treatment of polychlorinated biphenyl waste (PCB Special Measures Law) came into effect and it has become mandatory for companies to report the situation of storage and disposal of PCB waste and to dispose of PCB waste within a certain period specified by an ordinance. The scope of products and items subject to reporting was expanded by this law. Toshiba has been doing its utmost to ensure thorough investigation, accurate reporting and appropriate control.

Toshiba also provided guidance to its group companies, including not only factories but also company dormitories and residences, welfare facilities and buildings managed by Toshiba group companies, in order to ensure compliance with the law. Each operation reported its PCB storage and disposal situation.

As of 2001, the products and items stored by Toshiba Corp., the recently spun-off companies, and major affiliated companies, include 240 transformers, 6,500 high-pressure condensers, about 200,000 low-pressure condensers, fluorescent lamp ballasts and other equipment, some waste oil, oil containing trace amounts of PCB, and waste cloth and paper to which PCB is adhered.

For strict control, these products are stored in a dedicated building at each operations site in compliance with the prescribed rules. Moreover, dikes and double containers (receiver tanks) are installed to ensure safety. (See the photograph below.)

Plan for in-house treatment

Recently, as reflected in the PCB Special Measures Law, it is widely thought that continuing storage does not constitute a fundamental solution to the problem posed by PCB and that PCB and products containing PCB should be treated as soon as possible using reliable technology. It is in this context that Toshiba has set itself the goal of completing treatment of its entire stock of PCB stored in house by fiscal 2010. For this purpose, Ukishima Resource Recycling Center (tentative name) was established and preparations are in train for the construction of a small-scale treatment facility there. That facility will use an in-house-developed optical catalysis decomposition method for safe recycling of PCB.

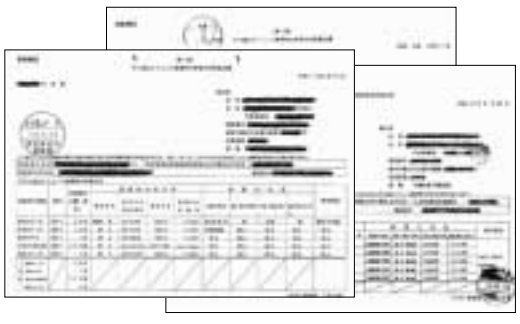
Toshiba's optical catalysis decomposition method was judged to be an appropriate treatment method and approved by the Ministry of Health and Welfare (the current Ministry of Health, Welfare and Labor) on October 1, 2000. The principle of this method is as follows: PCB is diluted using alcohol and irradiated by ultraviolet ray, and by means of palladium-based catalysis it is transformed into non-toxic salt and biphenyl. (Refer to the figure below.)

Ukishima Resource Recycling Center will detoxify PCB stored at Toshiba's Hamakawasaki Operations in Kawasaki. This facility will be able to treat a 4.6kg batch of PCB every 48 hours. That means 1 ton of PCB will be treated in four years.

In preparation, in fiscal 2000 Toshiba held meetings to explain the plan to local residents and voluntarily presented the facility plan to secure the understanding of the local community and the municipality. In fiscal 2001 Toshiba submitted an application for approval of installation of the recycling center and, following a review by a specialist committee organized by the City of Kawasaki and other legal procedures, Toshiba was granted approval in November 2001. Upon gaining approval, construction of the facility started. Following tests for operation of standalone units, comprehensive tests using water are now being performed. Operation is expected to start in July 2002 following issuance of the certification of completion of inspection prior to use witnessed by officials of the City of Kawasaki.

Example of completed forms for reporting in compliance with the PCB Special Measures Law and, for submission together with the forms, a photograph showing storage

Example of completed forms for reporting in compliance with the PCB Special Measures Law and, for submission together with the forms, a photograph showing storage



Storage of PCB-containing products on a tray

Outline of the small-scale treatment facility

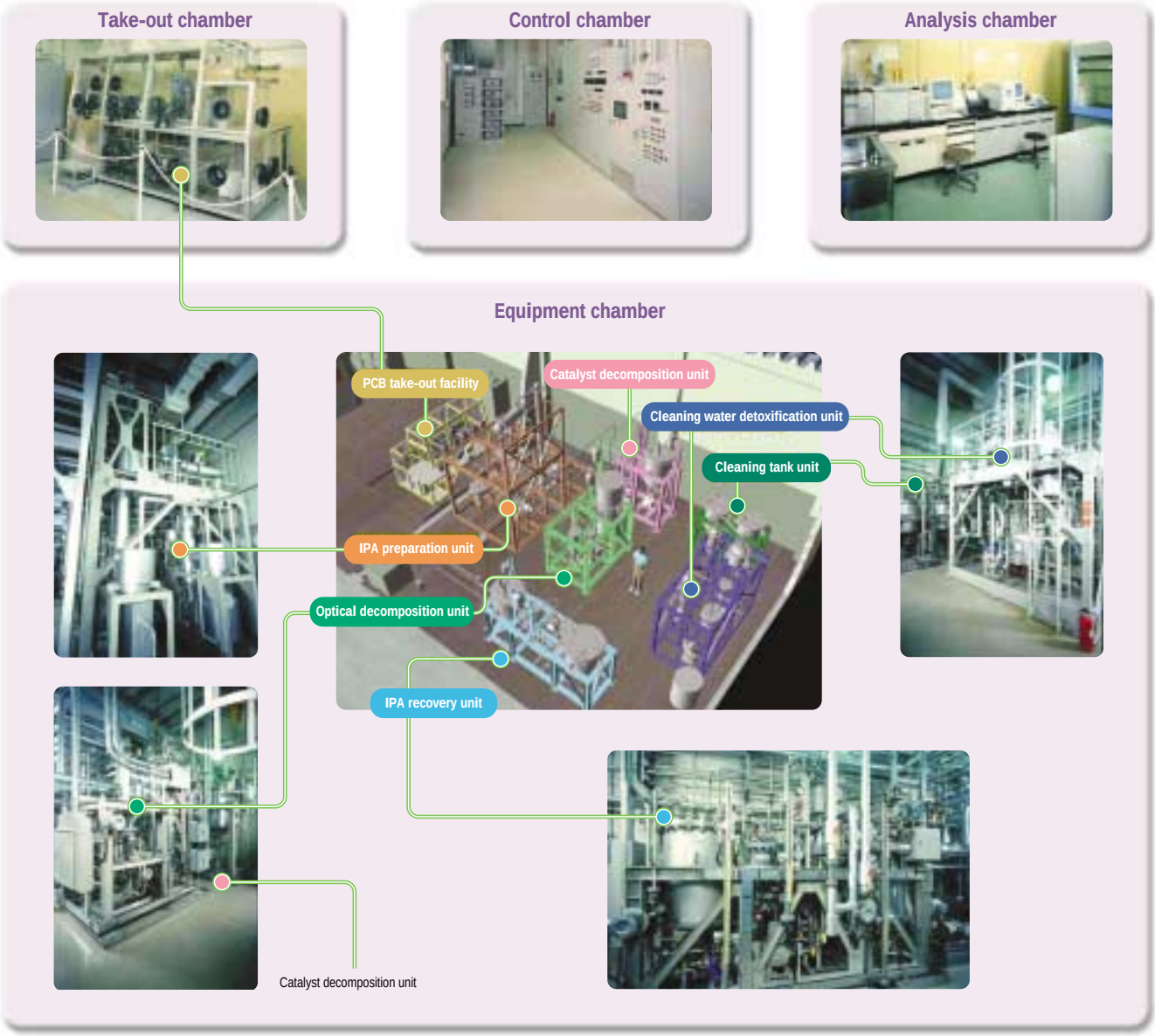
Shown below are the layout of the small-scale treatment facility and photographs of units. At the removal chamber, a condenser is placed in a sealed glove compartment and opened so that PCB is not exposed to indoor atmosphere. A pipe is connected to the opening to remove liquid PCB, which is then transferred to the oil storage tank in the compartment. This tank is connected to the adjacent equipment chamber by a pipeline (dual tube structure), and the PCB is supplied to the optical decomposition unit of the equipment chamber without coming into contact with external atmosphere.

PCB supplied to the optical decomposition unit is stirred and mixed with the solution (IPA solution containing NaOH) prepared in the IPA preparation unit of the equipment chamber and is optically decomposed.

Following optical decomposition, solution containing PCB is supplied to the catalyst decomposition unit and is decomposed by catalyst reaction until the PCB concentration is below the legally specified value.

The solution is finally supplied to the IPA recovery unit where IPA is recovered for reuse and the residue is removed.

Once experience has been gained at the Ukishima Resource Recycling Center, Toshiba intends to construct a larger treatment facility. Eventually, Toshiba would like to apply its expertise to the treatment of PCB stored by other companies and organizations in Japan.



Environmental considerations regarding products

Development of environmentally conscious products

With the aim of contributing to establishment of a recycling-based society, Toshiba strives to create environmentally conscious products (ECPs): that is, products whose environmental impacts are minimized at every stage of their entire life cycles—from materials procurement, manufacturing and distribution, through to consumption and eventual disposal. All Toshiba products are subjected to environmental assessments.

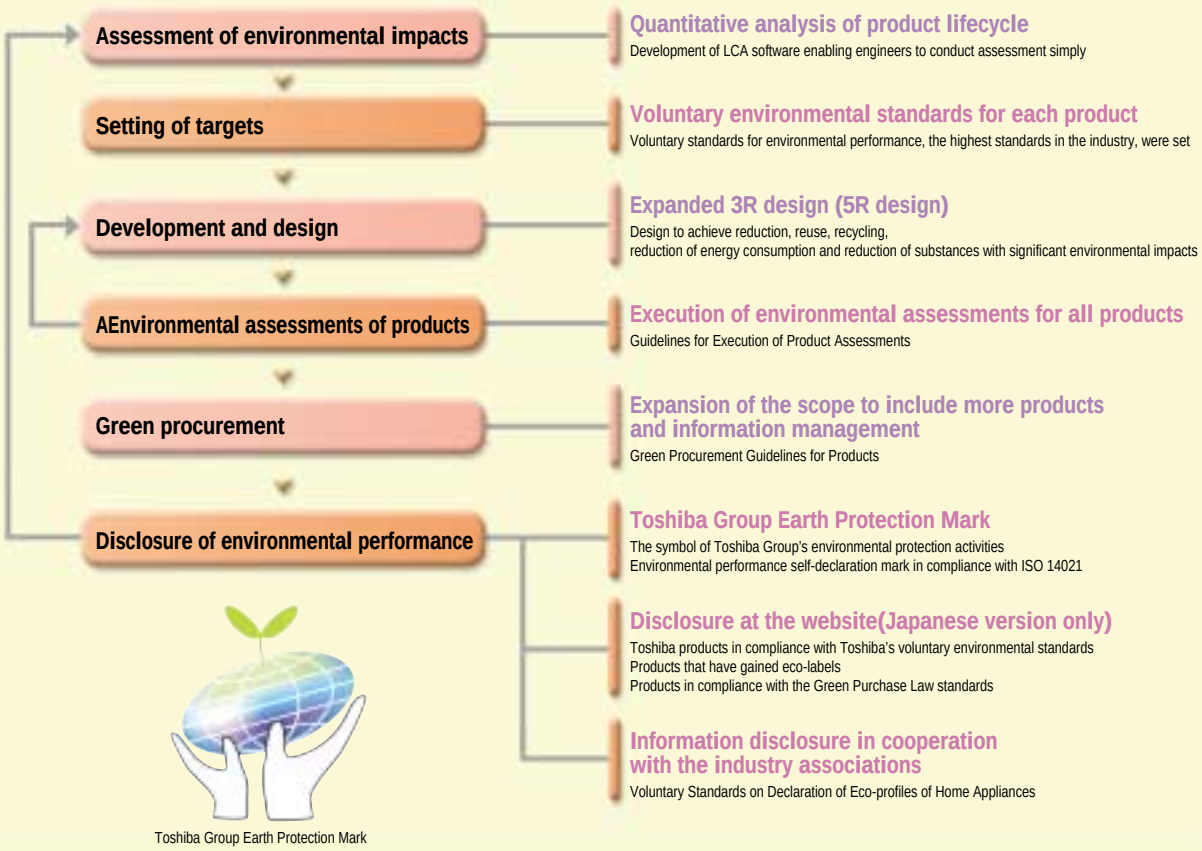
Process flow of ECP creation

The process flow of ECP creation is shown below. Environmental assessment of products in accordance with the Product Assessment Guidelines, which have been mandatory since April 1992, is the core process. These guidelines call for environmentally conscious design and environmental assessment of all products. Environmental assessment of products clarifies the extent to which the environmental impact of the contemplated product is reduced compared with that of the previous model. Products satisfying the assessment criteria are deemed to be ECPs. Items to be assessed and standards are set for each product lifecycle and compliance is evaluated. Standards are stringent and LCA is mandatory. 37% of consumer products and office automation equipment covered by the third voluntary environmental action plan were in compliance with the voluntary standards in fiscal 2001. To promote ECPs, Toshiba is emphasizing environmentally conscious design, quantification of environmental impacts of products, and disclosure of environmental performance of products.

Environmentally conscious design (5R design)

In line with the Recycling Law, Toshiba is promoting environmentally conscious design grounded in “3R” design. Toshiba has in fact enriched its concept of environmentally conscious design from 3R to 5R by including reduction of energy consumption and reduction of substances with significant environmental impacts.

ECP creation process flow and recent activities



Quantification of products' environmental impacts

It is necessary to clarify environmental impacts of products at the design phase in order to identify priority issues for environmentally conscious design. Lifecycle assessment (LCA) is a technique for this purpose. Until recently, however, the tasks involved in LCA, such as obtaining data, were burdensome for engineers. To overcome these drawbacks, Toshiba has developed an LCA tool based on the industry linkage method.
Also, Toshiba has developed a tool for assessing ease of disassembly of a designed item and is applying it for practical use.

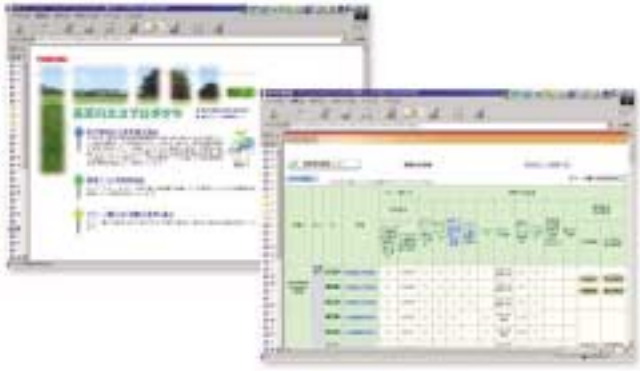
Disclosure of product eco-profiles

Data on environmental performance of main products are available at the Toshiba website. (Japanese version only) At present, data on Toshiba products in compliance with the voluntary environmental standards, products in compliance with the Green Purchase Law standards, and products that have gained eco-labels are provided.
(http://www.toshiba.co.jp/env/ecp/index_j.htm)

Reduction of substances with significant environmental impacts

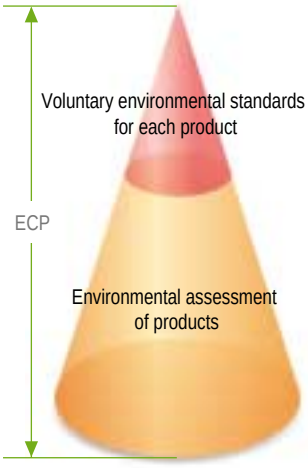
Toshiba has specified 54 substance groups as substances with significant environmental impacts and 19 of them as substances to be reduced.
Toshiba is making a corporate-wide effort to adopt lead-free soldering. The Corporate R&D Center and the Corporate Manufacturing Engineering Center have joined forces to solve technical problems, such as reliability, of lead-free soldering, and the achievements are being applied in manufacturing processes. So far, lead-free soldering has been adopted for 18 products, most of which are home appliances.

Disclosure of information on environmental performance of products at Toshiba website(Japanese version only)



ECP design support tool(Japanese version only)

Toshiba's ECP and environmental performance



Products for which lead-free soldering is adopted

Home appliances	● Fully automatic washing machines ● Dishwashers ● Bio-type waste disposers ● Televisions	● Drum-type washing machines /driers ● IH rice cookers ● IH cooking heaters ● CATV tuners	● Microwave ovens ● Refrigerators ● Vacuum cleaners ● Air conditioners
Office automation equipment etc.	● Personal computers ● Copiers	● Hard disk drives ● POS systems	● Barcode printers ● Battery packs

Refrigerators

Toshiba has developed a hydrocarbon-based refrigerant technology that does not contribute to global warming and also saves energy. Also, this technology reduces the use of other substances that have significant environmental impacts. The result is the Freon-free Optical Plasma Senzoko freezer/refrigerator introduced in January 2002.

Freon-free

Whereas CFC substitutes were previously used as a blowing agent for insulating materials and a refrigerant for previous models, Toshiba now uses cyclopentane and isobutene, both of which are hydrocarbon-based substances. Because hydrocarbon-based refrigerant is flammable, explosion-proof and safety technologies were developed to ensure safety in the event of leakage. Toshiba won a Nikkei BP Technology Award Grand Prize for the development of these technologies.

Non-CFC refrigerator (NF47K)

Energy saving

Adoption of a newly developed high-efficiency inverter compressor and an independently controlled refrigeration cycle reduced power consumption by 10%.

Also, an optical plasma deodorizer decomposes ethylene gas, which is generated by vegetables and causes their quality to deteriorate. As a result, vegetables retain their freshness longer and food waste is reduced.

Reduction in use of substances with substantial environmental impacts

The following environmentally friendly specifications are fruits of Toshiba's R&D.

- Non-vinyl chloride gasket
- Lead-free soldering for PCB assembly
- Lead-free soldering for welding of the suction pipe of the refrigeration cycle and the heat exchanger of the capillary tube

Vacuum cleaners

Environmental assessment of vacuum cleaners is in accordance with XX Division's standards at each phase of product planning, design, prototyping, and pilot production. This assessment includes LCA. Also, adoption of lead-free soldering for PCBs and elimination of use of vinyl chloride are being promoted.

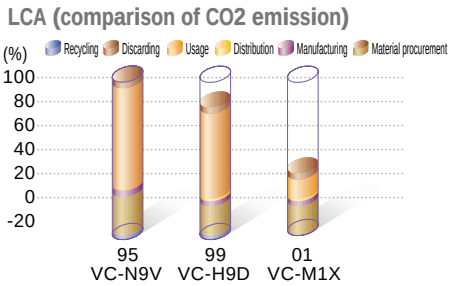
Adoption of LCA

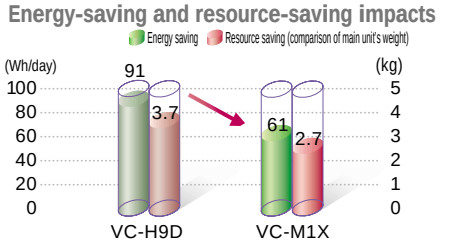
Environmental impacts of contemplated products throughout their lifecycles are assessed quantitatively to facilitate reduction of those impacts.

Energy saving and resource saving

The VC-M1X launched in September 2001 is a cordless vacuum cleaner that achieves outstanding energy saving and resource saving. Dust suction performance is the same as that of a conventional alternating-current-type model, but power consumption is 33% less.

Compact and lightweight, the VC-M1X offers excellent ease of use. The Magic Cyclone system (separation of dust and air by centrifugal force) has eliminated the need for paper dust bags, which are consumables.





Environmentally conscious technology

Use of lead-free soldering has been expanded. Major steps to achieve environmentally conscious products are:

- Substitution of elastomer for vinyl chloride used for hose
- Use of recycled materials (owner's manual and corrugated cardboard for packaging)
- Adoption of a high-performance nickel-metal-hydride secondary battery
- Indication of plastic and paper packaging to facilitate classification of waste

Dust and air separated by centrifugal force

VC-M1X

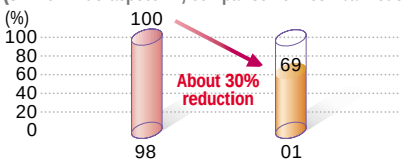
Televisions

Reduced power consumption

Thanks to adoption of a square cone picture tube and a square neck deflection yoke, deflection power during operation is reduced by 25%. Other important energy-saving measures include main power off zero watt function operable via the remote controller, degauss circuit off function. As a result, energy consumption is slashed by 30%.


36D2500

Reduction of power consumption per year
(32-inch wide-aspect TV, comparison of Toshiba models)



Recycling

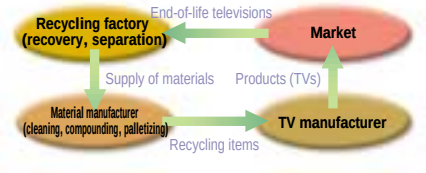
Toshiba has established a recycling loop for plastics used in televisions in order to reduce the volume of plastic waste from end-of-life televisions. This recycling loop is realized by the adoption of dry cleaning technology enabling high-yield removal of dust particles, labels and other foreign matter and paint. As a result, it has become possible to recover plastics comparable to new materials in performance and cost. Toshiba plans to use these recycled plastics in products from fiscal 2002 onward. Moreover, ease of disassembling is taken into account in designing televisions. As a result, the time required for disassembly is reduced.


Pikatter light-condensing picture tube separator

Toshiba has developed the world's first light-condensing picture tube separator, Pikatter*, and achieved a great improvement in ease of disassembly of picture tubes and accuracy of separation. This system has been delivered to Nishi Nihon Consumer Electronics Recycle Co., Ltd.

* Trademark registration filed

Concept of the recycling loop for plastics used in TVs



Air conditioners for use in stores

Equipped with Toshiba's unique dual inverter system for simultaneous control of two inverter compressors and using a new high-efficiency refrigerant R-410A, this new system achieves excellent energy saving and won the President's Prize of the Japan Energy Conservation Center at the Energy Saving Awards for fiscal 2001.

Adoption of a new refrigerant

Toshiba was the first in the industry to adopt the new high-efficiency refrigerant, R-410A. Adoption of R-410A for large-capacity air conditioners (rated cooling capacity of 28 kW class) is technically challenging because of the need to cope with high pressure.

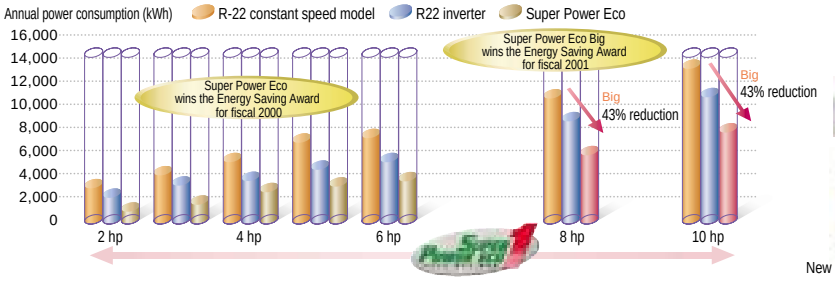
Excellent energy saving

Because the dual inverter system enables simultaneous synchronized operation of two 5-horsepower DC twin rotary compressors, an average COP (coefficient of power) for cooling and heating of 3.90 is achieved, which greatly exceeds the 3.06 benchmark set by the New Energy Saving Law, and industry-leading energy saving is realized. Also, annual electricity consumption is 43% lower than that of a conventional model thanks to a wider variable capacity range and improved partial load efficiency (estimation in accordance with JRA 4048).

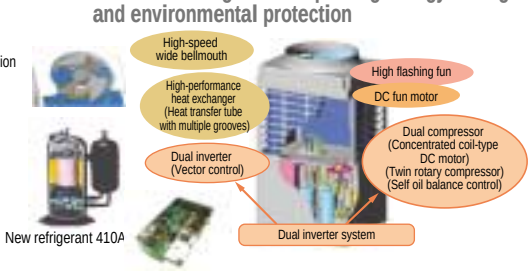
Space saving

Adoption of the new high-efficiency refrigerant R-410A has enabled miniaturization of the compressor and heat exchanger. As a result, the air conditioning unit weighs 206 kg, 18% less than a conventional model (250 kg) and the space requirement (0.74 m^2) is minimized.

Comparison of annual power consumption Energy saving by adoption of R410A refrigerant, DC twin rotary compressor, and IPDU vector control



Basic technologies underpinning energy saving and environmental protection



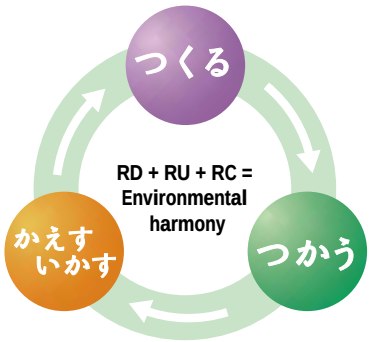
Personal computers

Toshiba has been working to achieve environmentally conscious personal computers based on its own environmental standards for personal computers, focusing on compactness, resource saving, long life, upgradability for long-term use, and adoption of reusable units. In December 2000, Toshiba's notebook PCs for the European market gained the German Blue Angel Mark (RAL-UZ93), the most prestigious environmental label in Europe. Toshiba PCs were the first notebook PCs to gain this mark.
The Law for Promotion of Effective Use of Resource, which came into effect in April 2001, requires that manufacturers ensure the design of PCs facilitates the 3Rs (reduce, reuse, recycle). Toshiba was quick to respond to these requirements. Numerous models of Toshiba PCs are in compliance with the criteria of the PC Green Label System introduced by Japan Electronics and Information Technology Industries Association (JEITA) in autumn 2001. Moreover, Toshiba opened Toshiba PC Recycling Center to establish a recycling system for business-use personal computers. Also, Toshiba has established a unique material recycling system based on the use of recycled plastics for computer chassis. Toshiba is working to improve the recycling rate without compromising quality.
The DynaBook SS2000, a notebook PC introduced in January 2002, is an environmentally conscious PC, only 14.9 mm thick and weighing just 1.17kg. Use of magnesium alloy for the chassis assures robustness and improves the recycling rate.
Toshiba adopted lead-free soldering for the printed circuit boards of PCs to reduce environmental impacts and is working on elimination of lead soldering. Having developed halogen- and antimony-free materials for notebook PC printed circuit boards, Toshiba is now using them as much as possible. In 1998 Toshiba became the first company in the world to begin mass production of printed circuit boards of this type.
Information on what Toshiba is doing, voluntary environmental standards for PCs, environmental labeling, Toshiba's response to the Green Procurement Law, etc. is available at http://www.dynabook.com.

DynaBook SS2000


Halogen/antimony-free print circuit board

Toward establishment of a recycling-based society



With a view to establishing a recycling-based society, Toshiba has set targets from the viewpoint of the 3Rs throughout product life cycles and is improving systems and developing tools to achieve those targets.

- Reduce = Reduction of waste = RD
- Reuse = Reuse of parts = RU
- Recycle = Recycling of end-of-use products as raw materials = RC

PC Green Label System

Remanufacturing (RM) of copiers

Toshiba introduced the Premage 651RM digital copier, an environmentally conscious product, in April 2001. 60% (mass ratio) of parts used for this product are recycled from end-of-life products. The Premage 651Rm is the first digital copier in the industry to achieve such a high rate of parts reuse. Parts reuse is a highly effective approach for reducing environmental impacts. Only recycled parts satisfying quality inspection standards, and thus equal to new parts in quality, are used.


Copier Premage 651RM

- ◆ Japan Environment Association's Eco Mark gained
- ◆ In compliance with the International Energy Star Program

Data on recycled parts	
Product's mas	250 kg
Total mass of recycled parts Approx	150 kg
Mass ratio of recycled parts	60% or more
Number of recycled parts Approx.	800
Major recycled parts	Frame, harness, large-capacity paper feeder unit, PCBs, laser unit, etc.

Space-saving escalator

To reduce the space occupied by escalators in buildings, Toshiba has developed a space-saving (narrow) escalator. Its width is 210 mm less than that of a conventional escalator. Commercialization of the space-saving escalator has achieved the following environmental benefits.

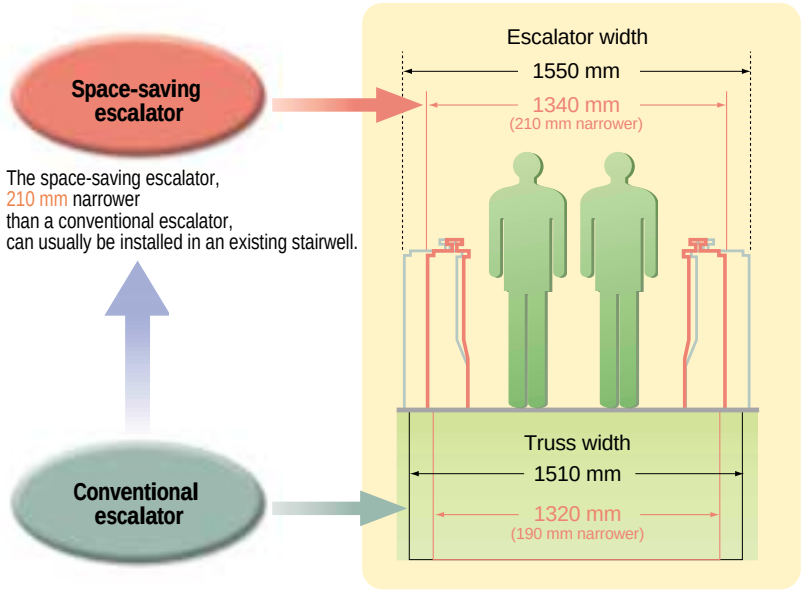
Less industrial waste

In the case of installing this escalator in a stairwell, because the shaft required is considerably smaller than that for a conventional escalator, the amount of industrial waste is reduced by 14% (comparison of Toshiba models, in the case of a floor height of 4 m)

Effective use of existing stairs and less installation work

In the case of installing an escalator in an existing building that has only narrow stairs, previously, construction work was necessary to secure sufficient space to accommodate a conventional escalator.

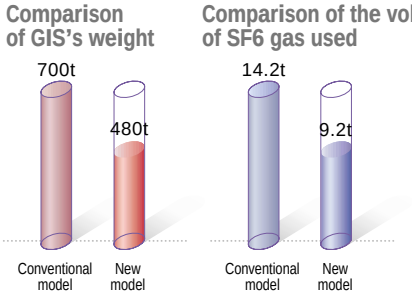
However, thanks to the advent of the space-saving escalator, it is often possible to install an escalator in the existing stairwell without the need for construction work to widen the shaft.



Gas insulated switchgear (GIS)

Gas insulated switchgear (GIS), a system indispensable for stable power supply, has a safe and compact structure in which SF6 gas with excellent insulation performance is charged.
On the other hand, like CO_2, SF_6 gas is a greenhouse gas. Therefore, in line with the international trend, Toshiba is working to reduce use of SF_6 gas.
In the 30 years since GIS was first applied for ultra-high-pressure facilities, single-point breaking by a gas-blast circuit-breaker (GCB) and integrated control of all three phases have been realized through technology development and miniaturization. These technologies assure high reliability.
The newly developed 300 kV GIS features an optimized design, achieved as a result of the improved accuracy of analysis technology concerning insulation, mechanical properties and heat, integrating component units and reducing the size and weight. Also, no inspection floor is required since access to component units is easy.
Furthermore, integration of three phases in a single cable makes transportation simpler.
As a result of these measures to reduce size and weight, the total weight of GIS is 31% less than that of conventional equipment, use of SF6 gas is reduced by 35%, and the number of trailers required for transport is halved.
Toshiba is stepping up efforts to develop environmentally conscious GIS through further reductions in size and weight.


GIS



Primary batteries

In response to the rapid diffusion of digital still cameras, Toshiba has established a concept for the next-generation primary battery based on a VOC (voice of customer) survey™ a battery, which is totally different from the alkali battery and has remarkably high output characteristics while maintaining the convenience of a primary battery. The fruit of R&D efforts based on this concept is GigaEnergy™, nickel batteries (ZR6).
For GigaEnergy™, in order to achieve performance far higher than that attainable with conventional alkali batteries, while maintaining compatibility with alkali batteries (LR6), Toshiba focused on nickel oxyhydroxide, which is used for the cathode of rechargeable batteries. Toshiba developed a nickel oxyhydroxide material that has excellent layer-structure crystallinity, and also successfully developed technologies for high-density filling and for reforming the particle surface of this material.
When this battery is used for a digital still camera, battery life five times longer than that of a conventional alkali battery is achieved, thus contributing to reduction of waste generation. (Approx. 5.2 times at 25℃ compared with a Toshiba alkali battery / Number of shots: 419 pictures)

Blister pack AA (4 batteries in a pack) ZR6G 4BP

New lead-free cold storage material for ultra-low temperature refrigerator

Cold storage material

Equipment utilizing superconductivity such as MRI (magnetic resonance imaging) equipment uses a compact refrigerator that can perform cooling down to ultra-low temperature of about -269℃. A heat exchanger used for such a refrigerator is filled with a material for storage of cold air. At present, lead is used in most ultra-low temperature refrigerators as the cold storage material.

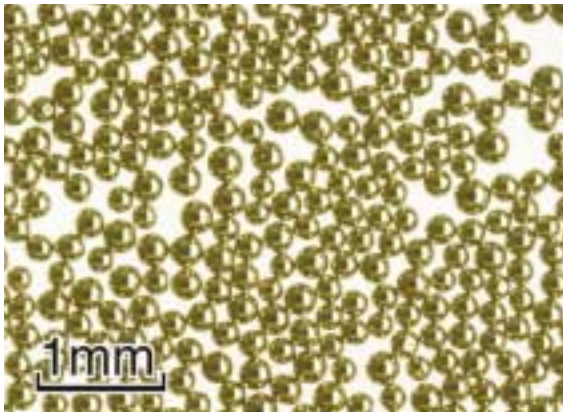
Development of lead-free cold storage material

Toshiba searched for candidate materials among alloys containing rare-earth elements other than lead. As a result, Toshiba has developed Er*-Co-Ni-based material that has a specific heat peak several times higher than that of lead in a particular temperature region and Ho*Cu whose specific heat exceeds that of lead in a wide temperature region.

Improved energy efficiency

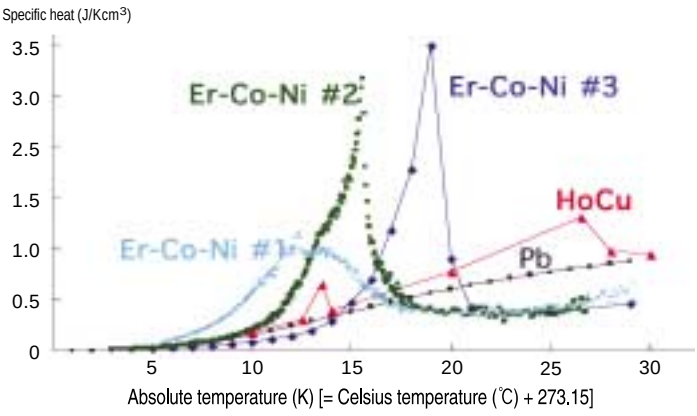
Use of these materials can eliminate use of lead, which has significant environmental impacts, and improve the energy efficiency of refrigerators.
At present, refrigerator manufacturers and semiconductor manufacturers, which are users of these refrigerators, are evaluating these materials for practical applications.

* ER (erbium), Ho (holmium)



Cold storage material processed into spheres for filling in a refrigerator

Temperature characteristic of specific heat of various types of cold storage materi
(The component ratio of Co and Ni is varied for Er-Co-Ni #1 to 3.)



Green procurement

Since April 2000, Toshiba has been conducting green procurement throughout its operations in accordance with the Green Procurement Guidelines established in December 1999.

Evaluation and selection of suppliers

In addition to quality, cost, deadlines and services, Toshiba evaluates suppliers' environmental protection activities and accords priority to suppliers with higher ratings.

Evaluation criteria

1) Has gained ISO 14001 or plans to do so
2) Promotes Green Procurement or plans to do so
3) Is actively undertaking environmental protection measures

Selection criteria for procured items

Toshiba accords priority to items that satisfy the criteria for reduced environmental impacts in addition to criteria for quality and cost. The following criteria are taken into account:

1) Resource saving: Low consumption of resources
2) Energy saving: Low consumption of energy
3) Potential for long-term use: Can be used for a long time
4) Reusability: Can be reused
5) Recyclability: Can be recycled
6) Use of recycled materials: The proportion of recycled materials is high.
7) Ease of disposal: The item is designed taking disassembly into account.
8) Substances with significant environmental impacts: Chemical substances contained in the item are controlled according to the control classification.

Substances with significant environmental impacts (54 types)

1) Substances whose use is prohibited (4 types)
2) Substances whose use is to be reduced or for which substitutes are to be used, and substances whose environmental impacts are to be minimized by recovery and detoxification through adoption of a closed system (19 types)
3) Substances whose volume of use is subject to strict control (31 types)

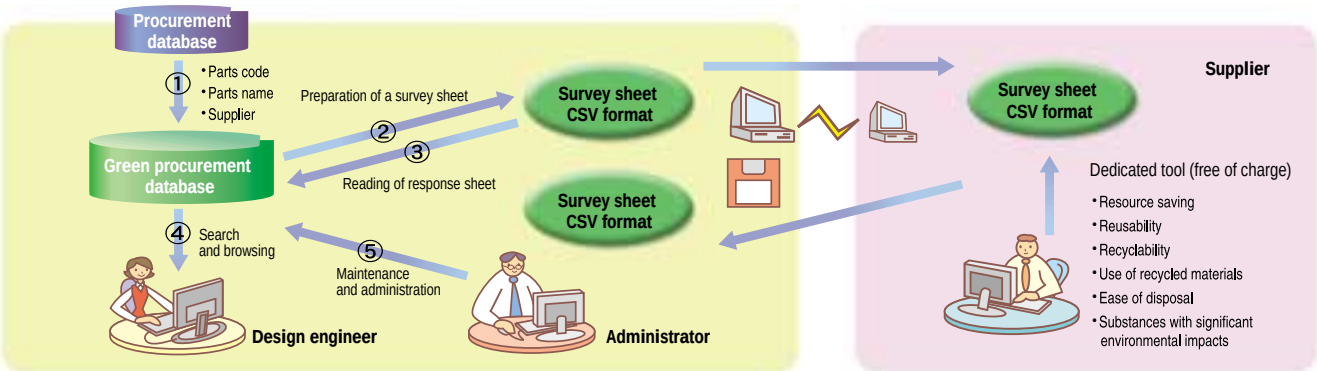
Contents of the Green Procurement Guidelines

I. Toshiba's basic policy for environmental protection
II. Toshiba's perspective on green procurement
III. Distribution of this guideline handbook
IV. Request for cooperation from suppliers

1) Objective
2) Toshiba's commitment
3) Range of applicability
4) Basis of evaluation and selection
5) Glossary of terms

The PDF file of the Green Procurement Guidelines is available for downloading at the Toshiba website for procurement:

http://www.toshiba.co.jp/procure/english/green/index.htm



Recycling of household appliances

The Home Appliance Recycling Law came into force in April 2001.
The flow of end-of-life home appliances in accordance with the Home Appliance Recycling Law is described below. End-of-life home appliances (air conditioners, televisions, refrigerators, washing machines) are first taken back by retailers and then transferred to take-back sites designated by manufacturers. End-of-life home appliances collected at designated take-back sites are transferred to recycling facilities and turned into resources through disassembly, crushing and classification processes.
According to the data for fiscal 2001 announced by the Ministry of Economy, Trade and Industry, 8.55 million units of end-of-life home appliances (four products) were collected at designated facilities. Toshiba (including Toshiba Carrier) collected 1.35 million units of end-of-life home appliances (four products), accounting for 16% of the total number of units collected.

Recycling processing

Recycling processes for the four products roughly consist of the following:

1) Freon refrigerant is recovered from air conditioners and refrigerators.
2) After crushing by large shredders or manual disassembly, materials are classified into iron, copper, aluminum, glass, plastics, etc.

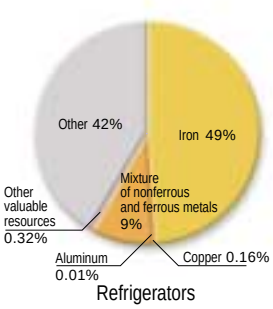
Recovered materials are recycled as raw materials for use in products via material manufacturers.
Toshiba's recycling rates for the four items are shown in the figure below. And the results are shown in the table below.

Development of next-generation recycling technology

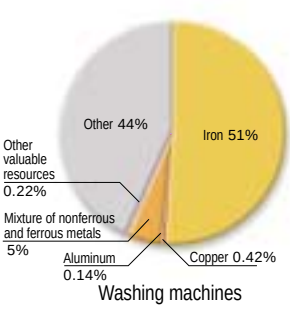
Toshiba is developing next-generation recycling technology and environmentally conscious products. For example, technology for recycling of plastics, which are used for TV cabinets, is being developed.
Toshiba has developed a method for recycling plastics used for TV cabinets as materials for reuse for the same purpose in collaboration with Nippon Steel Chemical Co., Ltd . This method involves classification, crushing, special cleaning, blending and palletizing.
Toshiba is developing technologies that take recyclability into account, such as design to facilitate disassembly and classification of materials.
As part of the drive to establish a recycling-based society, it is essential to develop a more efficient recycling system and to develop excellent recycling technologies and environmentally conscious products. Toshiba's efforts to respond to these needs are underpinned by close cooperation among the operations concerned.

Results of recycling of end-of-life home appliances (four products)

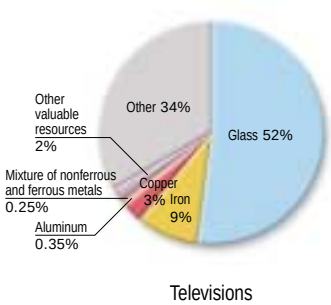
Classification		Refrigerators	Washing machines	Televisions	Air conditioners
Number of items collected at designated take-back sites	(thousand units)	355	415	399	176
Number of items processed for recycling	(thousand units)	350	408	388	172
Weight of items processed for recycling	(t)	21,345	12,259	10,959	7,886
Weight of items recycled	(t)	12,351	6,920	7,260	5,939
Recycling rate	(%)	57	56	66	75
Recycling rate mandated by the law	(%)	50	50	55	60



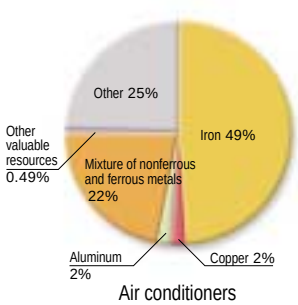
Refrigerators



Washing machines



Televisions



Air conditioners

* Other valuable resources are items of value that were able to be transferred, including printed circuit boards, plastics, etc.

Recycling of personal computers

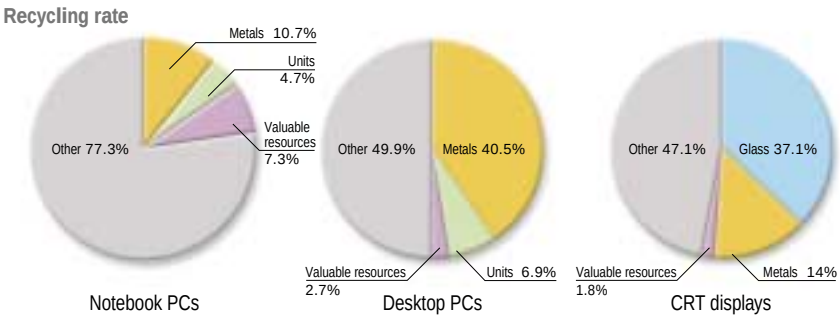
End-of-life PCs discharged by businesses

In April 2001, Toshiba put in place a system for recycling end-of-life personal computers from businesses in accordance with the Law for Promotion of Effective Use of Resources. Aware of the need for a nationwide network of recycling facilities in order to collect end-of-life personal computers discharged by businesses throughout Japan efficiently without imposing a burden on customers, Toshiba set up PC Recycling Center* in Tsurumi, Yokohama, and recycling facilities in ten major cities including Sapporo, Sendai, Nagoya, Osaka, Hiroshima and Kita-kyushu. Furthermore, having established a series of regional processing and recycling systems based on these recycling centers, Toshiba was certified by the Ministry of the Economy, Trade and Industry and the Ministry of the Environment concerning voluntary collection and recycling of specified end-of-life home appliances in March 2003.
In fiscal 2001, Toshiba processed 23,300 units or 203 tons of notebook and desktop PCs and monitors, twice the volume processed in the previous year.
Toshiba has applied for a license to engage in the large-area recycling specified industrial waste disposal business in accordance with the special measure of Article 9 of the Waste Management Law. Once the license is gained, using the nationwide transport network Toshiba intends to enhance the quality and efficiency of its system for collection and recycling of end-of-life PCs discharged by businesses.

End-of-life PCs discharge by consumers

Toshiba is examining a system for collection and recycling of end-of-life PCs discharged by consumers in accordance with the policy established as a result of the joint deliberations of the PC 3R session of the waste recycling taskforce of the Industrial Structure Council and the PC recycling discussion group of the Ministry of the Environment.
The new system is scheduled to be introduced in autumn 2003. Under this new system, the fee for collection and recycling will be added to the retail prices of personal computers. The fee for collection and recycling of personal computers that have already been sold will be charged at the time of discharge. Also, Toshiba envisages use of door-to-door parcel delivery services for convenient discharge and collection.

*** Toshiba PC Recycling Center at Term Corp.**
20-1 Kansei-cho, Tsurumi-ku,
Yokohama 230-0034
Tel: 045-510-0255
(office open from 9:00 to 17:00)



Recycling of rechargeable

Many Toshiba products use NiCd batteries, lithium ion batteries and other types of compact rechargeable batteries. Resources such as nickel, cadmium, cobalt and lead are the main materials used in these batteries. Toshiba is collecting and recycling rechargeable batteries to ensure effective use of limited resources.
In April 2001 the Compact Rechargeable Battery Recycling Promotion Center was established within the Battery Association of Japan. Toshiba was involved in setting up the Center and played an active role in developing an industry-wide system for recycling of batteries.
Previously the activities of the Battery Association of Japan focused on recycling of NiCd batteries. Since fiscal 2001 battery manufacturers and manufacturers of products that use compact rechargeable batteries have cooperated on recycling of all types of compact rechargeable batteries. It is important to ensure that users of products incorporating compact rechargeable batteries are aware of this recycling system and to design products so that batteries can be removed easily. So, the necessary information is indicated on owner's manuals and the products. Also, Toshiba's service centers where numerous end-of-life products are collected and recycling centers are registered with the Compact Rechargeable Battery Recycling Promotion Center, and Toshiba is making efforts to increase the quantity of compact rechargeable batteries recycled.

Comprehensive solutions for the environment

Systems

- Sludge gas fuel cell power generation system
- Treatment system for heavily contaminated organic waste water
- Cogeneration system

Sludge gas fuel cell power generation system

<Conversion of sludge into energy>

Drain sludge, which previously was incinerated or disposed of by landfill, is converted into biogases for use in fuel-cell power generation to produce electricity and heat.

Sludge gas fuel cell power generation system

Treatment system for heavily contaminated organic waste water

<Efficient treatment of water using biotechnology>

For treatment of heavily contaminated waste water containing high concentrations of organic effluent at food processing plants, Toshiba developed a methane fermentation bioreactor that replaces conventional active sludge treatment systems. This system has been delivered to many customers. Space-saving and economical processing is achieved with a reduced amount of sludge and low power consumption.

Waste water treatment plant at a food processing factory

Cogeneration system

<Environmentally friendly energy system >

Cogeneration systems promote energy saving and reduce emissions of CO_2 through effective utilization of electricity and heat. They are economical, too. Use of a cogeneration system in combination with commercial power sources assures stable power supply and reduces contract demand for commercial power.

Toshiba Fuchu Complex's Energy Center

Tools

- Environmental impact evaluation (LCA)
- Recyclability evaluation
- Ease-of-dismantling evaluation
- LCC estimation support
- Ease-of-assembly evaluation
- CAE and CAD
- Product environmental information
- Environmental data management
- PRTR support
- Chemical substance comprehensive control

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 environmental issues. Recognizing 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 based on a consideration of manufacturing, use, disposal and recycling, development of recycling technologies, and construction of environmental plants and involvement in environment-related services.

For further information about environmental solutions, please contact the Environment System Division. Tel: 03-3457-2276

Consulting services on environmental issues

- Regional environment improvement plan
- Environmental business plan
- Investigation of environmental impacts
- Investigation of enviromental effects
- Basic plant plan
- Execution of plant plan
- Life cycle assessment (LCA)
- Support concerning plant operation and maintenance
- Support concerning environmental education
- Support concerning environmental audit
- Support concerning gaining ISO 14001 certification
- Environmental analysis

Environmental consulting services

<Toshiba technologies are brought into full play>

To help realize a recycling-based society, Toshiba utilizes its expertise in the provision of consulting services on environmental themes.

Environmental education

Businesses

- Recycling of plastics
- Recycling of end-of-use household appliances
- Recycling of waste
- Environmental engineering

Environmental investigation and recovery services

<Purification of polluted soil and groundwater>

To help realize a recycling-based society, Toshiba utilizes its expertise in the provision of consulting services on environmental themes.

Groundwater pumping injection system

Soil gas investigation

Sapporo Plastic Recycling Co., Ltd.

<Oil reclamation from waste plastics>

In view of the Containers and Packaging Recycling Law, establishment of technologies for recycling of waste plastics is a pressing issue. 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.

The plant

Equipment

Energy
- Cogeneration equipment
- Fuel cell, solar cell

Waste
- Oil reclamation equipment
- Dechlorination equipment
- Crusher for large waste

Water
- Ozonizer
- Ultraviolet sterilizer
- Anaerobic bioreactor

Atmosphere
- CFC decomposition equipment
- Gas treatment equipment

- Equipment for converting sludge into gas
- Equipment for converting sludge into compost
- Centrifugal thin-film sludge dryer
- Waste effluent filtration equipment

Gas treatment equipment using plasma technology

<Decomposition of toxic substances using plasma>

Based on the development concept of gas treatment using electric energy with minimum use of chemical substances and additives, Toshiba sought to expand the application of plasma technology. The results include retaining the freshness of vegetables in refrigerators longer, deodorizing of refrigerator compartments, and deodorizing using smoke separators. Toshiba started development with the objective of applying plasma technology to treatment of exhaust gases from automobiles so as to reduce NOx and N_2O, and thus protect the atmosphere and help prevent global warming.

Smoke separator and refrigerator incorporating electric -discharge optical catalyst

Coexistence with the community

Working with communities for a better environment

Inspired by the group slogan, “Committed to People, Committed to the Future. Toshiba” Toshiba Group is actively contributing as a good corporate citizen to the accomplishment of society’s goals and is constantly seeking new approaches that help realize the goals of the global community, including ways to improve the global environment. Toshiba’s business operations are endeavoring to ensure that their activities are attuned to the needs of communities in accordance with their standards of business conduct.

Activities of Toshiba Science Museum, Toshiba foundations and operations

Toshiba Science Museum, opened in 1961, welcomes over 110,000 visitors a year. In addition to introduction of Toshiba’s cutting-edge technologies, Toshiba Science Museum is working to enhance children’s interest in science through exhibitions and experiments. Toshiba International Foundation, Toshiba America Foundation and Toshiba Thai Foundation provide support in the cultural and educational spheres.

Toshiba’s operations in Japan are working in their own right to meet the needs of local communities, for example, by organizing events in cooperation with local organizations.

Providing information on voluntary activities and supporting employees’ activities

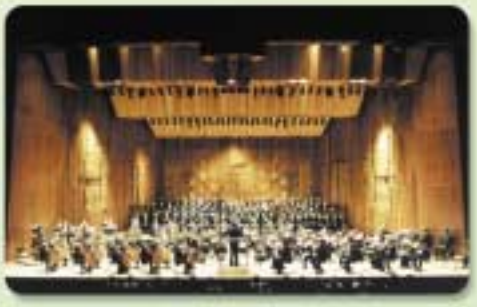
Toshiba supports employees’ voluntary activities. An intranet site devoted to voluntary activities provides information on recruitment of volunteers throughout Japan, and introduction of the various activities Toshiba engages in so as to contribute to society. Toshiba also provides financial support to voluntary non-profit organizations in which Toshiba employees are involved. Employees of 109 Toshiba Group companies made contributions to support those who suffered in the events of September 11 in the U.S.

Toshiba Science Museum is a fun place for every generation, from children to the elderly

Employees of Toshiba Group companies in China and their families, some 700 people in all, planted 15,000 saplings on a 13-hectare site

Toshiba Ride On Jazz Orchestra, a band formed by Toshiba employees, held a Christmas charity concert at Toshiba headquarters in support of Afghan refugees in cooperation with Peace Winds Japan, an NGO

To open children’s eyes to the tremendous possibilities of science, Toshiba supports various educational events in Japan, the United States, the UK and China highlighting the connections among science, technology and the Internet



Toshiba Philharmonic Orchestra, an orchestra consisting of Toshiba employees, performed with a famous British choir while touring Europe. Among the concerts was one performed for patients of St Luke’s Hospice, Plymouth, UK

Standards of Business Conduct concerning Relations with Communities

Policy

Toshiba is committed to fulfilling its responsibilities as a member of the community through cooperation with local communities and by maintaining good relations with communities.

Conduct

Officers and employees are required to act in accordance with the following.

(1) Respect the culture and customs of the communities in which Toshiba does business.

(2) Participate in local organizations and cooperate with community activities vigorously in order to contribute to solving the problems of communities and to achieve benefits for communities.

(3) Expand opportunities for contact with local communities in order to promote and secure the community’s understanding of Toshiba’s management policies and business activities.

Safety control and health care rooted in respect for the individual

Safety control and healthcare

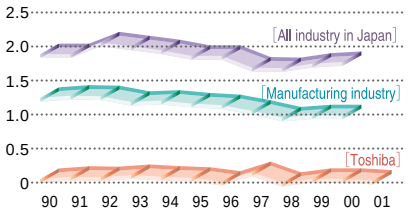
To a considerable degree, business activities derive their vitality from the physical and mental wellbeing of employees. Recently the focus has shifted from hygiene to healthcare relating to lifestyles and mental health. Toshiba's policy on safety and healthcare is to provide a safe and comfortable work environment conducive to the physical and mental health of everyone from the viewpoint of respect for the individual. Based on this policy, Toshiba's operations review existing measures and introduce new ones each year.

Safety control

The graph below shows rates of occurrence of accidents at work per one million hours. Compared with the average for industry in Japan and that for manufacturing industry, Toshiba has an excellent record.

The number of accidents resulting in a person being off work for four days or longer in fiscal 2001 was four less than in the previous year and the total number of accidents was the lowest ever. This improvement is attributable to Toshiba's activities to ensure safety, and, with this in mind, Toshiba is stepping up efforts to eliminate accidents. Toshiba recognizes the importance of thorough education of employees to enhance their sensitivity to risk in their daily activities. Toshiba's focus is shifting from elimination of accidents to elimination of risks.

Rates of occurrence of accidents at work (per one million hours)

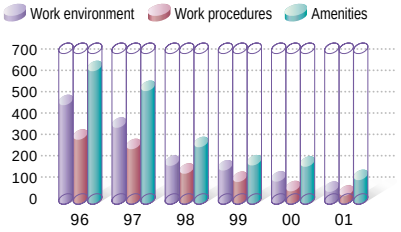


Work environment and healthcare

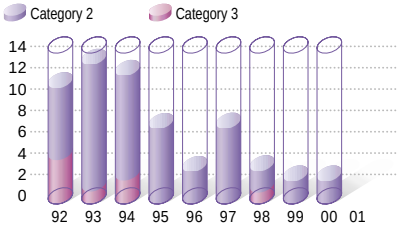
The results of evaluation of workplaces, initially from the viewpoint of improving the environment of manufacturing sites prone to danger, dirt and excessively demanding work, are shown in the graph below. Work environments, work procedures and amenities have all been greatly improved.

The number of workplaces that handle toxic substances and are classified as Category 2 or 3, which means the work environment requires improvement, has been decreasing and was zero for fiscal 2001.

Results of evaluation of workplace environment



Results of evaluation of work environment



Regarding the healthcare of employees, the number of people afflicted with lifestyle-related diseases and conditions has been gradually increasing and Toshiba recognizes the necessity of educating employees to raise their awareness about the relationship between lifestyles and diseases. Toshiba is vigorously working to enhance the awareness of employees regarding the importance of maintaining good mental health. Education is provided for employees and supervisors and information on mental health is available on the intranet and in in-house magazines. Healthcare staff are making efforts to improve their skills and to share their expertise and experience. Based on cooperation between healthcare staff and the corporate health insurance association, a hotline has been opened for employees and their families so that they can receive advice from healthcare professionals.

Toshiba Group Safety and Health Congress

Toshiba has been holding an annual corporate-wide congress since 1975 with the aim of ensuring the safety and wellbeing of employees. Some 500 people, mainly executives of Toshiba Corp. and Toshiba Group companies, participated in the 27th congress held in the first year of the 21st century. The congress focused on ways of ensuring that Toshiba Group achieves excellence in terms of safety and healthcare in the 21st century. Chairing the conference, Mr. Tadashi Okamura, president of Toshiba Corp., stressed that ensuring the safety and wellbeing of employees greatly depends on management's values, attitudes and dynamism. He urged the participants to ensure that considerations regarding the safety and healthcare of employees are fully reflected in management decisions. The agenda included an overview of Toshiba Group's safety control and presentations on case studies of Toshiba and affiliated companies. The congress provides executives with an opportunity to renew their commitment to ensuring the safety and wellbeing of employees.

Congress on safety and healthcare

Environmental communication

Toshiba Group has been enhancing its environmental protection activities on a continuous basis. We are stepping up our environmental protection efforts, and, at the same time, disseminating environmental information through various media in order to communicate Toshiba's viewpoint and activities.

The 11th Toshiba Environment Technology Exhibition

The 11th Environment Technology Exhibition held in February 2002 at Toshiba headquarters building was open to the general public. It attracted some 2,650 visitors, including customers, central and local government officials, journalists, academics, environmental-protection professionals at other companies, and employees of Toshiba Group.
Bearing the comments of visitors in mind, we are expediting our efforts to commercialize certain systems and reconsidering the content and size of the exhibition in order to enhance accessibility and communication.

PC disassembly demonstration attracted visitors

Visitors' comments

- The idea of using plasma for both decomposition and optical catalyst excitation to deal with odor is interesting.
- A lot of PCB and equipment containing PCB is stored. It should be treated as soon as possible.
- The exhibits cover a wide field.
- Toshiba explained its targets well concerning adoption of lead-free soldering and the products involved.
- Demonstration of disassembly of PCs, deletion of data and disassembly of picture tubes was impressive.
- The questionnaire response fields were spacious. I was also able to exchange views with other visitors.
- The exhibits were rather sophisticated for the general public, but they contain important lessons.
- Toshiba's proactive disclosure to external parties is good.
- The business potential of environmental protection is difficult to determine.
- The exhibition is impressive in terms of content and quality and it is useful. I hope the exhibition's scope will be expanded and that it will continue to be open to the general public.

Involvement in activities of municipalities

Oita Operations is actively involved in environmental protection activities promoted by the local government to facilitate communication with external parties.
Oita Operations' activities include participation in Oita Eco Seminar to foster leaders of environmental activities in communities and workplaces, registration with Eco Oita Premises to introduce environmental protection activities, and working as an Oita prefecture global warming prevention activity promoter at the request of the local government.
Shunyu Kubito, a Toshiba employee, was one of the initial participants in Oita Eco Seminar established by Oita prefectural government. He was able to share his ideas with environmental leaders from Oita prefecture and exchange views on the environmental problems confronting Oita prefecture.

It was a great opportunity for me to think deeply about environmental problems with people who are concerned about the environment. I will cherish the network of people with whom I became acquainted through participation in this seminar and I am resolved to utilize the knowledge I gained at the seminar in Oita Operations' environmental protection activities. (Comment by Shunyu Kubito)

Presentation marking completion of the seminar

Readers' comments on Toshiba Environmental Report 2001

The following are some comments from readers who responded to the questionnaire distributed with the report.

It is rich in content and informative. On the other hand, it is difficult to understand if you just quickly read through it. It would be a good idea to include an easy-to-understand summary with the report.
(56 years old, female, public administration)

It is interesting that customer benefits in environmental accounting are discussed in terms of the competitive advantage of environmental management.
(46, male, businessman)

Companies tend to be unwilling to disclose information concerning soil and groundwater pollution. Toshiba's disclosure on these issues and implementation of measures are impressive.
(59, male, businessman)

Toshiba was quick to send me the information I requested. Thanks to that I was able to write a good report and now I also have a better image of Toshiba.
(20, female, student)

It is good that cost effectiveness is quantified in environmental accounting.
(22, male, student)

The report would benefit from the inclusion of more detailed data,
such as data on LCA and data on each production site.
(62, male, university professor)

Text and numbers in figures and tables are very small and difficult to read.
(64, male, proprietor)

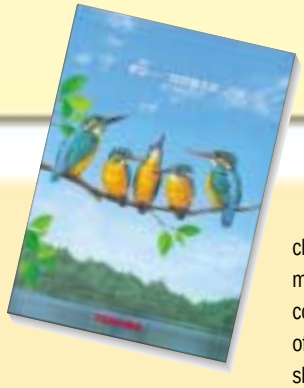
Even groundwater issues are discussed. It is an objective report.
(51, male, businessman)

There is a growing interest in energy saving and disposal of toxic substances, such as PCB, and the report does a good job of explaining a major company's commitment to dealing with these issues.
(85, male, proprietor)

When deciding what information to disclose it must be difficult to deal with all the differing opinions and possible drawbacks. I hope Toshiba will continue to disclose information proactively. I am unfamiliar with some terms and so a glossary would be useful.
(21, male, student)

I think the report is too long. Some people might think it is a waste of paper. Why doesn't Toshiba make better use of its website?
(42, male, businessman)

We welcome readers' comments. Indeed, your comments will change Toshiba Group's environmental reports.



Comments from various organizations

Rating agency A

Targets, results and achievement ratios are listed in a table. For items for which achievement ratios are low, explanations are provided and future activities are outlined.
Coverage of the items in our checklist is relatively uniform.
Regarding environmental impacts, the same units are used (energy is converted into CO_2 and others are expressed in tons) and 5-year trends are shown.
Readers' comments on the previous year's environmental report are introduced (not only positive comments but also suggestions for improvements). Toshiba invites readers' comments and inquiries, indicating that it is making an effort to communicate.
From now on, it is to be hoped that information on each site and on control of pollutants will be enhanced.

University B

What is most impressive in Toshiba's environmental report is the description of the method of calculating assumed benefits. It is unclear why cadmium is used as the basis for the calculation and this point needs to be clarified. It would be better to include more quantitative data and graphs comparing this year's results with those of the previous year. Capital expenditure should also be mentioned separately.

Company C

The balance between text, figures and photographs is good. The pages summarizing Toshiba's environmental protection activities and environmental impact data make Toshiba's environmental report accessible to readers. The clear description of the reporting policy and the scope of the report (organizations) facilitate the reader's understanding.
In future reports, explanation of environmental aspects and environmental management (especially, legal compliance and emergency preparedness and response) should be expanded.

Company D

The report is systematic and of high quality. The description of environmental accounting is detailed and so is the information on soil contamination. The reliability of information should be confirmed in some way.

Editorial comment

In designing environmental reports and editing their content, communication with customers, shareholders, investors and other stakeholders is becoming increasingly important. In creating Toshiba Environmental Report 2002, we aimed to achieve a report which addresses the needs of readers based on the "voice of customer."
As shown above, readers' comments vary greatly and are often diametrically opposed, indicating that it is impossible to satisfy every preference. However, we tried to reflect readers' comments and comments from various organizations in this report, as much as possible.
In this report, our intention is to provide easy-to-understand yet informative descriptions. We welcome your comments on our efforts to improve our environmental report. The next environmental report is scheduled to be published in June 2003.

Toshiba Group's PRTR data for individual business premises (results for fiscal 2001)

Unit: t/year

Data on all business premises of Toshiba Corp. and data on major business premises of affiliated companies are shown. The PRTR Law mandates reporting of substances whose consumption is 5 t or more per year (marked with blue in the table), and of specified Class I Designated Chemical Substances whose amount handled is 0.5 t or more per year (marked with pink in the table). Toshiba Group's survey requires operations to report any substances whose amount handled is 0.01 t or more per year. Amounts handled, consumed and recycled are also shown. As well as the names of individual business premises and addresses, main products of the premises and their primary measures for reduction of release of chemical substances are described.

Nasu Operations and Nasu Operations-Electron-Tubes, Toshiba Corp.

1385, Shimoishigami, Otawara, Tochigi Pref. 324-8550 Main products: Medical equipment, electron tubes Primary measure: Change of materials

Substance number specified by the law	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				Release to atmosphere	Release to public water systems	Release to soil	Landfill within operations		Transfer as waste	Transfer to sewage				
230	Lead and its compounds	—	3.05	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	1.73	0.00	1.24
232	Nickel compounds	—	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.04	0.00

Fukaya Operations, Toshiba Corp.

1-9-2, Hatara-cho, Fukaya, Saitama Pref. 366-8510

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
1	Zinc water-soluble compounds	—	13.41	0.00	0.00	0.00	0.00	0.00	2.64	0.00	2.64	6.57	4.20	0.00
16	2-aminoethanol	141-43-5	100.12	0.00	0.00	0.00	0.00	0.00	24.23	0.00	24.23	0.00	75.89	0.00
43	Ethylene glycol	107-21-1	1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38	0.00	0.00
63	Xylene	1330-20-7	2.44	2.03	0.00	0.00	0.00	2.03	0.41	0.00	0.41	0.00	0.00	0.00
69	Chromium (VI) compounds	—	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00
227	Toluene	108-88-3	11.57	11.25	0.00	0.00	0.00	11.25	0.32	0.00	0.32	0.00	0.00	0.00
230	Lead and its compounds	—	39.26	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.49	37.19	0.00	1.58
243	Barium and its water-soluble compounds	—	252.16	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	244.61	0.00	7.53
283	Hydrogen fluoride and its water-soluble salts	—	82.27	0.00	12.83	0.00	0.00	12.83	0.07	0.00	0.07	0.00	69.37	0.00
304	Boron and its compounds	—	1.15	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03	1.12	0.00	0.00
346	Molybdenum and its compounds	—	3.06	0.00	0.00	0.00	0.00	0.00	3.04	0.00	3.04	0.02	0.00	0.00

Fuchu Complex, Toshiba Corp.

1, Toshiba-cho, Fuchu, Tokyo 183-8511

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
40	Ethylbenzene	100-41-4	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
63	Xylene	1330-20-7	17.66	9.59	0.00	0.00	0.00	9.59	2.80	0.00	2.80	5.27	0.00	0.00
108	Inorganic cyanide compounds (except complex salts and cyanates)	—	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00
177	Styrene	100-42-5	2.30	0.03	0.00	0.00	0.00	0.03	0.00	0.00	0.00	2.27	0.00	0.00
227	Toluene	108-88-3	18.51	10.61	0.00	0.00	0.00	10.61	0.17	0.00	0.17	7.73	0.00	0.00
230	Lead and its compounds	—	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00
299	Benzene	71-43-2	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00

Hino Operations, Toshiba Corp.

3-1-1, Asahigaoka, Hino, Tokyo 191-8555

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
230	Lead and its compounds	—	1.05	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.21	0.84	0.00	0.00

Ome Operations, Toshiba Corp.

2-9, Suehiro-cho, Ome, Tokyo 198-8710

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
230	Lead and its compounds	—	5.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.27	0.00	1.85

Hamakawasaki Operations, Toshiba Corp.

2-1, Ukishima-cho, Kawasaki-ku, Kawasaki, Kanagawa Pref. 210-0862

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
25	Antimony and its compounds	—	5.72	0.00	0.00	0.00	0.00	0.00	1.43	0.00	1.43	4.29	0.00	0.00
30	Polymer of 4,4'-isopropylidenediphenol and 1-chloro-2,3 -epoxypropane (liquid); bisphenol A type epoxy resin (liquid)	25068-38-6	12.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.29	0.00	0.00
40	Ethylbenzene	100-41-4	2.19	2.01	0.00	0.00	0.00	2.01	0.18	0.00	0.18	0.00	0.00	0.00
63	Xylene	1330-20-7	14.21	11.72	0.00	0.00	0.00	11.72	1.22	0.00	1.22	0.00	1.27	0.00
64	Silver and its water-soluble compounds	—	0.46	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.37	0.00	0.08
68	Chromium and chromium (III) compounds	—	0.61	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.58	0.00	0.00
100	Cobalt and its compounds	—	1.13	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.28	0.85	0.00	0.00
108	Inorganic cyanide compounds (except complex salts and cyanates)	—	0.30	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.28	0.00
177	Styrene	100-42-5	0.83	0.83	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00
202	Tetrahydromethylphthalic anhydride	11070-44-3	6.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.32	0.00	0.00
227	Toluene	108-88-3	12.85	11.63	0.00	0.00	0.00	11.63	1.22	0.00	1.22	0.00	0.00	0.00
230	Lead and its compounds	—	0.79	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.27	0.52	0.00	0.00
231	Nickel	7440-02-0	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
232	Nickel compounds	—	1.46	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.37	1.09	0.00	0.00
272	bis (2-ethylhexyl) phthalate	117-81-7	0.20	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.20	0.00	0.00	0.00
304	Boron and its compounds	—	0.34	0.00	0.06	0.00	0.00	0.06	0.23	0.00	0.23	0.05	0.00	0.00
309	Poly (oxyethylene) nonylphenyl ether	9016-45-9	0.13	0.00	0.10	0.00	0.00	0.10	0.03	0.00	0.03	0.00	0.00	0.00
311	Manganese and its compounds	—	1.59	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.22	1.37	0.00	0.00
312	Phthalic anhydride	85-44-9	12.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.56	0.00	0.00

Yanagicho Complex, Toshiba Corp.

70, Yanagi-cho, Saiwai-ku, Kawasaki, Kanagawa Pref. 212-8501

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
40	Ethylbenzene	100-41-4	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00
63	Xylene	1330-20-7	2.45	0.69	0.00	0.00	0.00	0.69	0.00	0.00	0.00	1.76	0.00	0.00
227	Toluene	108-88-3	2.54	0.35	0.00	0.00	0.00	0.35	0.00	0.00	0.00	2.19	0.00	0.00
230	Lead and its compounds	—	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00
299	Benzene	71-43-2	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00
311	Manganese and its compounds	—	0.48	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.47	0.01	0.00	0.00

Komukai Operations, Toshiba Corp.

1, Komukai-Toshiba-cho, Saiwai-ku, Kawasaki, Kanagawa Pref. 212-8581 Wave application systems, broadcasting systems Improvement of coating facilities

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
40	Ethylbenzene	100-41-4	0.50	0.21	0.00	0.00	0.00	0.21	0.29	0.00	0.29	0.00	0.00	0.00
63	Xylene	1330-20-7	0.65	0.28	0.00	0.00	0.00	0.28	0.37	0.00	0.37	0.00	0.00	0.00
227	Toluene	108-88-3	0.78	0.33	0.00	0.00	0.00	0.33	0.45	0.00	0.45	0.00	0.00	0.00
230	Lead and its compounds	—	0.51	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.27	0.00	0.16
283	Hydrogen fluoride and its water-soluble salts	—	0.52	0.04	0.00	0.00	0.00	0.04	0.49	0.00	0.49	0.00	0.00	0.00

* Toshiba Group designates benzene as a substance whose use at manufacturing processes is prohibited.
However, according to the PRTR Law, benzene contained in gasoline at business premises that have gasoline tanks is within the scope of reporting.

Corporate Research & Development Center, Toshiba Corp. 1, Komukai-Toshiba-cho, Saiwai-ku, Kawasaki, Kanagawa Pref. 212-8582 R&D Reduction of consumption

Substance number specified by the law	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				Release to atmosphere	Release to public water systems	Release to soil	Landfill within operations		Transfer as waste	Transfer to sewage				
283	Hydrogen fluoride and its water-soluble salts	—	0.35	0.00	0.00	0.00	0.00	0.00	0.33	0.02	0.35	0.00	0.00	0.00

Microelectronics Center, Toshiba Corp. 1, Komukai-Toshiba-cho, Saiwai-ku, Kawasaki, Kanagawa Pref. 212-8582

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
16	2-aminoethanol	141-43-5	0.57	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.57	0.00	0.00	0.00
40	Ethylbenzene	100-41-4	0.14	0.01	0.00	0.00	0.00	0.01	0.13	0.00	0.13	0.00	0.00	0.00
63	Xylene	1330-20-7	0.78	0.04	0.00	0.00	0.00	0.04	0.74	0.00	0.74	0.00	0.00	0.00
224	1,3,5-trimethylbenzene	108-67-8	0.39	0.02	0.00	0.00	0.00	0.02	0.37	0.00	0.37	0.00	0.00	0.00
260	pyrocatechol	120-80-9	0.10	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.00
283	Hydrogen fluoride and its water-soluble salts	—	8.40	0.07	0.00	0.00	0.00	0.07	0.00	0.22	0.22	0.00	8.12	0.00

Keihin Product Operations, Toshiba Corp. 2-4, Suehiro-cho, Tsurumi-ku, Yokohama, Kanagawa Pref. 230-0045

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
63	Xylene	1330-20-7	1.39	1.32	0.00	0.00	0.00	1.32	0.07	0.00	0.07	0.00	0.00	0.00
227	Toluene	108-88-3	29.84	12.47	0.00	0.00	0.00	12.47	17.37	0.00	17.37	0.00	0.00	0.00

Corporate Manufacturing Engineering Center, Toshiba Corp. 33, Shin-isogo-cho, Isogo-ku, Yokohama, Kanagawa Pref. 235-0017 R&D of manufacturing technologies Reduction of consumption

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
43	Ethylene glycol	107-21-1	0.13	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.13	0.00	0.00	0.00

Yokohama Complex, Toshiba Corp. 8, Shin-sugita-cho, Isogo-ku, Yokohama, Kanagawa Pref. 235-8522

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
231	Nickel	7440-02-0	1,000.57	0.00	0.00	0.00	0.00	0.00	56.38	0.00	56.38	645.30	0.00	298.89
232	Nickel compounds	—	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00
283	Hydrogen fluoride and its water-soluble salts	—	28.24	0.02	1.45	0.00	0.00	1.47	0.00	0.00	0.00	0.00	26.77	0.00
311	Manganese and its compounds	—	51.38	0.00	0.00	0.00	0.00	0.00	1.16	0.00	1.16	30.83	0.00	19.39
346	Molybdenum and its compounds	—	176.03	0.00	0.20	0.00	0.00	0.20	0.37	0.00	0.37	145.26	0.67	29.53

Chemical Materials & Components Dept., Yokohama Operations-Materials & Components, Toshiba Corp. 3583-5, Kawashiri, Yoshida-cho, Haibara-gun, Shizuoka Pref. 421-0302 Fluorescent materials Improvement of processes

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
100	Cobalt and its compounds	—	197.86	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	196.87	0.00	0.98
231	Nickel	7440-02-0	17.20	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.17	17.03	0.00	0.00
243	Barium and its water-soluble compounds	—	17.57	0.06	0.00	0.00	0.00	0.06	1.44	0.00	1.44	16.08	0.00	0.00
283	Hydrogen fluoride and its water-soluble salts	—	0.12	0.00	0.02	0.00	0.00	0.02	0.01	0.00	0.01	0.09	0.00	0.00
304	Boron and its compounds	—	4.42	0.00	0.77	0.00	0.00	0.77	3.07	0.00	3.07	0.58	0.00	0.00

Aichi Operations, Toshiba Corp. 991, Anada-cho, Seto, Aichi Pref. 489-0003 Washing machines Use of substitutes

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
63	Xylene	1330-20-7	0.74	0.74	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00
227	Toluene	108-88-3	2.06	2.06	0.00	0.00	0.00	2.06	0.00	0.00	0.00	0.00	0.00	0.00
230	Lead and its compounds	—	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00

Yokkaichi Operations, Toshiba Corp. 800, Yamanoisshiki-cho, Yokkaichi, Mie Pref. 512-8550 ICs Reduction of waste water concentrations

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
16	2-aminoethanol	141-43-5	63.90	0.00	0.00	0.00	0.00	0.00	56.22	0.00	56.22	0.00	7.68	0.00
43	Ethylene glycol	107-21-1	1.96	0.00	0.00	0.00	0.00	0.00	1.96	0.00	1.96	0.00	0.00	0.00
63	Xylene	1330-20-7	72.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.05	0.00
258	Piperazine	110-85-0	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00
283	Hydrogen fluoride and its water-soluble salts	—	198.70	0.35	7.50	0.00	0.00	7.85	0.00	0.00	0.00	0.00	190.85	0.00
304	Boron and its compounds	—	0.16	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.16	0.00	0.00	0.00

Osaka Operations, Toshiba Corp. 1-6, Ota Toshiba-cho, Ibaraki, Osaka 567-0013 Refrigerators Use of substitutes

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
25	Antimony and its compounds	—	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64	0.00	0.00
63	Xylene	1330-20-7	0.28	0.28	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
85	Chlorodifluoromethane; HCFC-22	75-45-6	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00
132	1,1-dichloro-1-fluoroethane; HCFC-141b	1717-00-6	210.71	2.11	0.00	0.00	0.00	2.11	5.48	0.00	5.48	203.12	0.00	0.00
227	Toluene	108-88-3	0.46	0.21	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.25
230	Lead and its compounds	—	2.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01	0.00	0.33
311	Manganese and its compounds	—	0.12	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.00	0.00	0.00
338	Methyl-1,3-phenylene diisocyanate; m-tolylene diisocyanate	26471-62-5	647.41	0.00	0.00	0.00	0.00	0.00	4.84	0.00	4.84	642.57	0.00	0.00

Himeji Operations, Toshiba Corp. 50, Kamiyobe, Yobe-ku, Himeji, Hyogo Pref. 671-1295 Precision electronic parts, LCDs Use of substitutes

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
40	Ethylbenzene	100-41-4	0.39	0.12	0.00	0.00	0.00	0.12	0.27	0.00	0.27	0.00	0.00	0.00
63	Xylene	1330-20-7	2.83	0.64	0.00	0.00	0.00	0.64	1.49	0.00	1.49	0.70	0.00	0.00
227	Toluene	108-88-3	2.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38	0.00	0.00
242	Nonylphenol	25154-52-3	0.28	0.00	0.28	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00
270	Di-n-butyl phthalate	84-74-2	0.10	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.09	0.00	0.00
283	Hydrogen fluoride and its water-soluble salts	—	3.02	0.03	2.31	0.00	0.00	2.34	0.35	0.00	0.35	0.00	0.32	0.00
309	Poly (oxyethylene) nonylphenyl ether	9016-45-9	0.32	0.00	0.20	0.00	0.00	0.20	0.12	0.00	0.12	0.00	0.00	0.00

Taishi Branch Works, Himeji Operations, Toshiba Corp. 300 Ikaruga, Taishi-cho, Ibo-gun, Hyogo Pref. 671-1561 Color picture tubes, discrete semiconductor devices Reduction of waste water concentrations

Substance number specified by the law	Substance name	CAS number	Amount handled	Amount released					Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				Release to atmosphere	Release to public water systems	Release to soil	Landfill within operations	Total amount released	Transfer as waste	Transfer to sewage				
1	Zinc water-soluble compounds	—	0.10	0.00	0.06	0.00	0.00	0.06	0.04	0.00	0.04	0.00	0.00	0.00
25	Antimony and its compounds	—	486.90	0.00	0.00	0.00	0.00	0.00	6.67	0.00	6.67	472.96	0.00	7.26
30	Polymer of 4,4'-isopropylidenediphenol and 1-chloro-2,3 -epoxypropane (liquid); bisphenol A type epoxy resin (liquid)	25068-38-6	1.45	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.23	1.22	0.00	0.00
40	Ethylbenzene	100-41-4	2.10	0.21	0.00	0.00	0.00	0.21	1.90	0.00	1.90	0.00	0.00	0.00
43	Ethylene glycol	107-21-1	0.17	0.00	0.09	0.00	0.00	0.09	0.07	0.00	0.07	0.01	0.00	0.00
47	Ethylenediaminetetraacetic acid	60-00-4	0.14	0.00	0.14	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00
63	Xylene	1330-20-7	22.18	9.34	0.00	0.00	0.00	9.34	12.84	0.00	12.84	0.00	0.00	0.00
68	Chromium and chromium (III) compounds	—	0.70	0.00	0.13	0.00	0.00	0.13	0.47	0.00	0.47	0.11	0.00	0.00
69	Chromium (VI) compounds	—	6.35	0.00	0.08	0.00	0.00	0.08	0.11	0.00	0.11	0.04	6.12	0.00
100	Cobalt and its compounds	—	3.64	0.00	0.09	0.00	0.00	0.09	3.00	0.00	3.00	0.55	0.00	0.00
202	Tetrahydromethylphthalic anhydride	11070-44-3	5.37	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.62	4.75	0.00	0.00
224	1,3,5-trimethylbenzene	108-67-8	5.18	1.92	0.00	0.00	0.00	1.92	3.26	0.00	3.26	0.00	0.00	0.00
227	Toluene	108-88-3	63.90	50.77	0.00	0.00	0.00	50.77	13.14	0.00	13.14	0.00	0.00	0.00
230	Lead and its compounds	—	3,279.24	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.69	3,227.88	0.00	50.66
231	Nickel	7440-02-0	786.46	0.00	3.24	0.00	0.00	3.24	0.00	0.00	0.00	682.96	0.00	100.27
232	Nickel compounds	—	0.33	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.28	0.05	0.00	0.00
243	Barium and its water-soluble compounds	—	1,788.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,758.70	0.00	29.76
254	Hydroquinone	123-31-9	0.11	0.00	0.11	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00
283	Hydrogen fluoride and its water-soluble salts	—	82.97	0.19	4.06	0.00	0.00	4.25	0.00	0.00	0.00	0.00	78.72	0.00
304	Boron and its compounds	—	4.68	0.01	0.14	0.00	0.00	0.15	0.00	0.00	0.00	4.17	0.00	0.36

Kitakyushu Operations, Toshiba Corp. 1-10-1, Shimoitozu, Kokurakita-ku, Kitakyushu, Fukuoka Pref. 803-8686 Color picture tubes, discrete semiconductor devices Reduction of waste water concentrations

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
16	2-aminoethanol	141-43-5	1.80	0.00	0.00	0.00	0.00	0.00	1.80	0.00	1.80	0.00	0.00	0.00
24	n-alkylbenzenesulfonic acid and its salts (alkyl C=10-14)	—	3.30	0.00	0.00	0.00	0.00	0.00	3.30	0.00	3.30	0.00	0.00	0.00
43	Ethylene glycol	107-21-1	0.50	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00
63	Xylene	1330-20-7	5.10	4.59	0.00	0.00	0.00	4.59	0.51	0.00	0.51	0.00	0.00	0.00
172	N,N-dimethylformamide	68-12-2	0.38	0.01	0.00	0.00	0.00	0.01	0.37	0.00	0.37	0.00	0.00	0.00
252	Arsenic and its inorganic compounds	—	0.17	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.17	0.00	0.00	0.00
266	Phenol	108-95-2	2.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00
283	Hydrogen fluoride and its water-soluble salts	—	57.00	0.57	0.00	0.00	0.00	0.57	0.57	4.56	5.13	0.00	51.30	0.00
304	Boron and its compounds	—	0.40	0.00	0.00	0.00	0.00	0.00	0.26	0.02	0.28	0.00	0.12	0.00
309	Poly (oxyethylene) nonylphenyl ether	9016-45-9	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.00	0.00	0.00

Oita Operations, Toshiba Corp. 3500, Oaza Matsuoka, Oita, Oita Pref. 870-0197 System LSIs Change of process materials

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
16	2-aminoethanol	141-43-5	61.22	0.00	0.00	0.00	0.00	0.00	59.38	0.00	59.38	0.00	1.84	0.00
43	Ethylene glycol	107-21-1	1.30	0.00	0.00	0.00	0.00	0.00	1.30	0.00	1.30	0.00	0.00	0.00
47	Ethylenediaminetetraacetic acid	60-00-4	0.41	0.00	0.41	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00
95	Chloroform	67-66-3	0.53	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.53	0.00	0.00	0.00
258	Piperazine	110-85-0	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00
260	Pyrocatechol	120-80-9	5.05	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	0.00	0.05	0.00
283	Hydrogen fluoride and its water-soluble salts	—	145.37	0.07	10.46	0.00	0.00	10.52	3.77	0.00	3.77	0.00	131.07	0.00
304	Boron and its compounds	—	0.42	0.01	0.06	0.00	0.00	0.07	0.35	0.00	0.35	0.00	0.00	0.00
309	Poly (oxyethylene) nonylphenyl ether	9016-45-9	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00

Fuchu Operations, Toshiba Elevator and Building Systems Corp. 1, Toshiba-cho, Fuchu, Tokyo 183-8511 Elevators Change of process materials

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
63	Xylene	1330-20-7	9.21	9.21	0.00	0.00	0.00	9.21	0.00	0.00	0.00	0.00	0.00	0.00
227	Toluene	108-88-3	13.31	13.31	0.00	0.00	0.00	13.31	0.00	0.00	0.00	0.00	0.00	0.00

Yokosuka Operations, Toshiba Lighting & Technology Corp. 1-201-1 Funakoshi-cho, Yokosuka-shi, Kanagawa Pref. 237-8510 Metal materials for lighting equipment, lighting tubes Recovery and recycling of materials

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
230	Lead and its compounds	—	3.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.81	0.00	0.01
232	Nickel compounds	—	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.29	0.00	1.71
243	Barium and its water-soluble compounds	—	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00
346	Molybdenum and its compounds	—	6.66	0.00	0.00	0.00	0.00	0.00	6.66	0.00	6.66	0.00	0.00	0.00

Ohito Operations, Toshiba TEC Corp. 570 Ohito-cho, Tagata-gun, Shizuoka Pref. 410-2392 POS terminals Use of substitutes

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
25	Antimony and its compounds	—	5.91	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08	5.83	0.00	0.00
230	Lead and its compounds	—	3.76	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	1.07	0.00	2.68

Fuji Operations, Toshiba Carrier Corp. Air conditioners, compressors Change of processes

Substance number	Substance name	CAS number	Amount handled	Amount released				Total amount released	Amount transferred		Total amount transferred	Amount consumed	Amount removed and treated	Amount recycled
				atmosphere	public water systems	soil	Landfill		waste	sewage				
16	2-aminoethanol	41-43-5	1.49	0.00	0.07	0.00	0.00	0.07	0.00	0.00	0.00	0.00	1.42	0.00
40	Ethylbenzene	100-41-4	1.49	0.82	0.00	0.00	0.00	0.82	0.11	0.00	0.11	0.56	0.00	0.00
63	Xylene	1330-20-7	11.76	8.43	0.00	0.00	0.00	8.43	0.44	0.00	0.44	2.89	0.00	0.00
64	Silver and its water-soluble compounds	—	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00
68	Chromium and chromium (III) compounds	—	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00
85	Chlorodifluoromethane; HCFC-22	75-45-6	284.72	0.36	0.00	0.00	0.00	0.36	3.20	0.00	3.20	281.16	0.00	0.00
101	2-ethoxyethyl acetate; ethylene glycol monoethyl ether acetate	111-15-9	0.24	0.23	0.00	0.00	0.00	0.23	0.01	0.00	0.01	0.00	0.00	0.00
144	Dichloropentafluoropropane; HCFC-225	—	0.13	0.13	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00
224	1,3,5-trimethylbenzene	108-67-8	0.17	0.13	0.00	0.00	0.00	0.13	0.04	0.00	0.04	0.00	0.00	0.00
227	Toluene	108-88-3	10.42	6.38	0.00	0.00	0.00	6.38	0.43	0.00	0.43	3.61	0.00	0.00
230	Lead and its compounds	—	0.49	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.48	0.00	0.00
231	Nickel	7440-02-0	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00
299	Benzene	71-43-2	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00
304	Boron and its compounds	—	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00
310	Formaldehyde	50-00-0	0.23	0.23	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00
311	Manganese and its compounds	—	1.08	0.00	0.06	0.00	0.00	0.06	0.09	0.00	0.09	0.93	0.00	0.00

History of Toshiba's environmental protection activities

Promotion organizations		Measures and activities
Environmental Protection Planning Division	2001	Commended in the Green Awards and the Global Environmental Awards
	2000	Third Voluntary Environmental Plan　Announcement of environmental accounting
Environmental Protection & Recycling Planning Center	1999	Publication of Environmental Report 1998　Termination of use of incinerators
	1998	
Recycling Promoting Group	1997	Revision of Environmental Basic Rules, Completion of securing ISO 14001 certification
	1996	Second Voluntary Environmental Plan
Environmental Protection Center	1995	New Environmental Basic Rules　Start of securing ISO 14001 certification
	1994	Abolition of use of 1-1-1-trichloroethane
Environmental Protection & Production Group	1993	First Voluntary Environmental Plan　New environmental audit (EASTER) Abolition of use of specific freons for cleaning
Corporate Environmental Protection Council	1992	
	1991	Product assessment, energy-saving targets
Basic Commitment of Toshiba Group and corporate slogan		
Environmental Engineering Laboratory	1990	Environmental Guidelines for Structures, freezing the amount of industrial waste
Corporate environmental protection system	1989	Environmental Basic Rules, ODS reduction plan, environmental audit
Environmental Protection Center	1988	

Toshiba received the Excellence Award in the third Ozone Layer Protection Awards

Scope of Toshiba Environmental Report 2002

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

Toshiba Electronic Systems Co., Ltd.
Tokyo Electronic Industry Co., Ltd.
Toshiba Logistic Support Corp.
Toshiba EI Control System Corp.
Toshiba Industrial Products Manufacturing Corp.
Toshiba Personal Computer System Ltd.
Toshiba Multimedia Devices Co., Ltd.
Toshiba Visual-Equipment Corp.
Kitashiba Electric Co., Ltd.
Iwate Toshiba Electronics Co., Ltd.
Kaga Toshiba Electronics Co., Ltd.
Fukuoka Toshiba Corp.
Toshiba Components Co., Ltd.
Kitsuki Toshiba Electronics Corp.
Takeda Toshiba Electronics Corp.
Buzen Toshiba Electronics Corp.
Hamaoka Toshiba Electronics Corp.
Yokkaichi Toshiba Electronics Corp.
Himeji Toshiba E.P. Corp.
A&T Battery Corp.
Toshiba Hokuto Electronics Corp.
Toshiba Metal Parts Co., Ltd.
Toshiba Battery Co., Ltd.
Toshiba Medical Manufacturing Co., Ltd.
Toshiba Home Technology Co., Ltd.
Toshiba Electric Appliances Co., Ltd.

Toshiba Elevator and Building Systems Corp.
Toshiba Elevator Products Corp.
Term Corp.
Japan Precision Corp.
Toshiba Lighting & Technology Corp.
Toshiba Shomei Precision Corp.
Wako Electric Co., Ltd.
Harison Toshiba Lighting Co., Ltd.
Toshiba TEC Corp.
Fujiken Co., Ltd.
Tosei Denki Co., Ltd.
TEC Izu Electronic Co., Ltd.
Toshiba Carrier Corp.
Toshiba Carrier Products Corp.
Shibaura Mechatronics Corp.
Shibaura NIDEC Co., Ltd.
Toshiba Chemical Corp.
Toshiba Kyoka Plastic Kogyo Co., Ltd.
Toshiba Logistics Corp.
(45 domestic affiliated companies)

Toshiba International Corp.
Toshiba do Brasil S.A.
Toshiba Information Systems (UK) Ltd.
Toshiba Europe GmbH
Dalian Toshiba Television Co., Ltd.

Toshiba Information Equipment (Philippines), Inc.
Toshiba Singapore Pte., Ltd.
Toshiba America Information Systems, Inc.
P.T. Toshiba Consumer Products Indonesia
Toshiba America Consumer Products, Inc.
Toshiba Electromex, S.A. de C.V.
Toshiba Computer Systems (Shanghai) Co., Ltd.
Changzhou Toshiba Transformer Co., Ltd.
Toshiba Semiconductor (Thailand) Co., Ltd.
Toshiba Electronics Malaysia Sdn., Bhd.
Toshiba Semiconductor GmbH
Wuxi Huazhi Semiconductor Co., Ltd.
Toshiba Display Devices (Thailand) Co., Ltd.
Jiangxi Toshiba Electronic Materials Co., Ltd.
Toshiba Consumer Products (Thailand) Co., Ltd.
Toshiba Dalian Co., Ltd.
Hangzhi Machinery & Electronics Co., Ltd.
TEC Singapore Electronics Pte., Ltd.
TIM MalaysiaAdn., Sdn. Bhd.
Toshiba TEC Europe Image Information Systems S.A.
Toshiba Copying Machine (S.Z) Co., Ltd.
Toshiba Lighting Products S.A.
Toshiba Chemical Singapore Pte., Ltd.
Toshiba Chemical (Thailand) Co., Ltd.
Tochemi Wuxi Electro-Chemical Corp.
(30 overseas affiliated companies)

Companies highlighted in yellow are main core companies and members of Toshiba Corporate Environmental Protection Council

Cover illustration

Dolphins communicate with each other using while swimming and playing. They have a social life in harmony with the nature. The cover illustration alludes to Toshiba Group's profound commitment to environmental protection.

Some part of technology adoption and data is limited to domestic purpose only.
Please address any comments or inquiries you may have
on Toshiba Environmental Report 2002 to the following organization:
If you refer articles of the report, please confirm us beforehand.

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Toshiba Group Earth Protection Mark

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Toshiba Environmental Report 2002 is available on the Internet at:
URL http://www.toshiba.co.jp/env/

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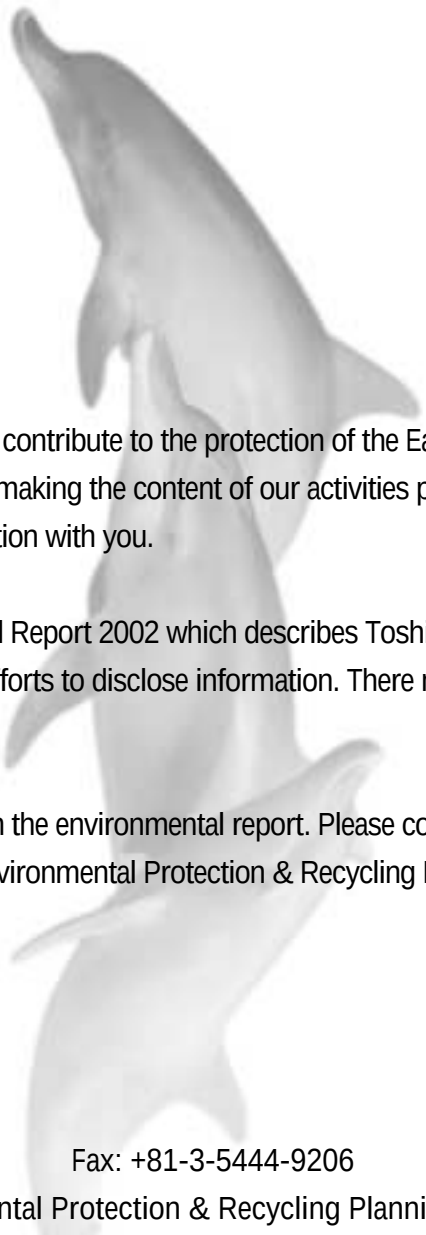
We welcome your comments and inquiries.*



Toshiba Group is doing its utmost to contribute to the protection of the Earth's environment, which is the common heritage of humankind. By making the content of our activities public and receiving your comments, we would like to deepen communication with you.

Publication of Toshiba Environmental Report 2002 which describes Toshiba Group's environmental protection activities is a part of our efforts to disclose information. There may be some insufficiency in terms of the content and readability.

Your comments will help us to enrich the environmental report. Please complete the questionnaire on the back of this sheet and fax it to the Environmental Protection & Recycling Planning Center.

Fax: +81-3-5444-9206
Environmental Protection & Recycling Planning Center.
Toshiba Corporation

E-MAIL:environment@toshiba.co.jp

* Your comments may be quoted in the next environmental report without attribution.

We welcome your opinions, comments, requests, etc.

FAX:+81-3-5444-9206

■ **How do you evaluate Toshiba Group's environmental activities?**

☐Excellent ☐Good ☐Satisfactory ☐Unsatisfactory ☐Poor

■ **Please state your reasons.**

■ **What are your desires regarding Toshiba Group's environmental activities and disclosure of environmental information?**

■ **What is your evaluation of Toshiba Environmental Report 2002?**

・Content ☐Good ☐Satisfactory ☐Insufficient

・Length ☐Long ☐Appropriate ☐Short

・Design ☐Good ☐Satisfactory ☐Poor

・Ease of understanding ☐Easy ☐Satisfactory ☐Difficult

■ **Please state your reasons.**

■ **Which subject was of the most interest to you and why?**

■ **(For those who read Toshiba Environmental Report 2001)**
What is your evaluation of Toshiba Environmental Report 2002 compared with Toshiba Environmental Report 2001?

■ **Which of the following best describes you or your affiliation?**

☐Customer ☐Involved in procurement at a company/organization ☐Government or governmental body ☐Journalist

☐Research/educational institution ☐Financial/investment institution ☐Shareholder

☐Involved in environmental issues at a company/organization ☐Environmental NGO/NPO ☐Environmental specialist

☐Supplier ☐Student ☐Resident in a community where Toshiba Group has premises

☐Other (Please specify:)

■ **How did you know about this report?**

☐Toshiba website ☐Website other than Toshiba website ☐Seminar/meeting ☐Exhibition ☐Newspaper/magazine

☐Toshiba sales personnel ☐Other (Please specify:)

■ **Please give us any other opinions, impressions, requests, etc.**

Thank you. If agreeable to you, we would appreciate it if you would complete the form below.

Name	Male/Female	Age
Address		
Occupation/Organization	Department/Title	

■ **Would you like us to send you the next Toshiba environmental report (scheduled to be issued in June 2003)?**

☐Yes ☐No