

# Environmental Performance

## Environmental Management

### Targets and Results

### Environmental Impacts at a Glance

#### Mitigation of Climate Change

- Reduction of CO2 Emissions during Product Usage
- Reduction of Greenhouse Gas Emissions Caused by Business Activities

#### Management Of Chemicals

- Management of Chemicals in Products
- Management of Chemicals Used in Manufacturing Processes

#### Optimization Of Resources

- Resource-saving Products and Recycling Measures
- Waste Reduction and Recycling in Business Activities

## Environmental Communication

Detailed information is available on the Toshiba website.

#### Items of High Interest to Stakeholders

- Case studies of development of products contributing to mitigation of climate change
- Policies and vision on environmental management
- Case studies of recyclable products
- Case studies of products using renewable energy

Source: Interest Survey conducted prior to the editing of this report [▶ P4](#)

As shown above, stakeholders showed high interest in availability of product information. So, this report is designed to present as many case studies as possible in an easy-to-understand manner.

## Environmental Performance

# Environmental Management

For sustainable development of the Earth, 520 Toshiba Group companies are striving to achieve Environmental Vision 2010.

## Toshiba Group's Environmental Management

### Create new values while pursuing symbiosis with the Earth

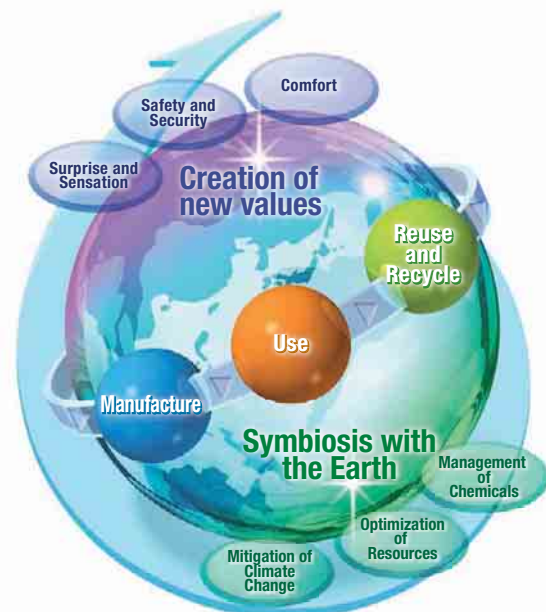
Environmental management, as practiced by Toshiba Group, aims to contribute to sustainable development with two aspects: firstly, creating new values through products and, secondly, pursuing symbiosis with the Earth by reducing environmental impacts throughout business processes and products.

In January 1989 Toshiba established the Basic Policy for Environmental Protection founded on the recognition that the Earth is an irreplaceable asset and it is humankind's duty to hand it on to future generations in a sound state. In fiscal 1993 Toshiba launched its first Voluntary Environmental Plan, a five-year action plan. Subsequently, we have expanded the scope of our activities while setting increasingly tough targets.

Since fiscal 2005, we have been implementing the Fourth Voluntary Environmental Plan [▶ P42](#) focused on enhancement of product eco-efficiency and business process innovation to attain the goals set by the Environmental Vision 2010 [▶ P41](#) for which a new indicator, eco-efficiency, was introduced.

### Committed to People, Committed to the Future. TOSHIBA

Contribute to sustainable development of the Earth throughout our business processes and products



## To Promote Environmental Management

### Global environmental management systems

The Corporate Environment Management Committee is Toshiba Group's supreme decision-making body on environmental management. It proposes solutions to problems concerning management, technology development, production and sales that are related to environmental issues, deliberates on specific measures, and determines the orientation of activities. Also, there are Environmental Management Committees in in-house companies, key group companies, at a regional level (Americas, Europe, China, and Asia and Oceania), and at each site.

### Environmental management audit system for compliance and risk management

In fiscal 1993 Toshiba Group started environmental audits of sites and subsequently, with the addition of environmental technology audits of products, audits based on the Group's unique criteria have been conducted. In fiscal 2004 we introduced assessment of the environmental management performance level of in-house companies and key group companies.

In fiscal 2006, by integrating these audit schemes, a new comprehensive environmental audit system, New EASTER (Environmental Audit System in Toshiba on the basis of ECO Responsibility), was put in place. In addition to environmental management audits covering in-house companies and 17 key group companies, New EASTER based on the 3 gen (actual) approach (the actual situation of actual items should

be checked at actual workplaces) covers 110 sites including non-manufacturing sites and affiliates outside the scope of consolidation. Sites with relatively low environmental impacts and those which are not within the scope of audits conduct self-assessment based on the same criteria applied for audits. Through environmental audits, Toshiba Group is striving to ensure compliance and strengthen risk management while promoting environmental activities.

Starting from fiscal 2006, results of evaluation of the environmental management level are reflected in the business performance evaluation in order to promote environmental efforts as an integral part of management.

In fiscal 2006, Toshiba Group was neither in breach of any law nor subject to any fine or other penalty concerning the environment.

### Environmental information and accounting

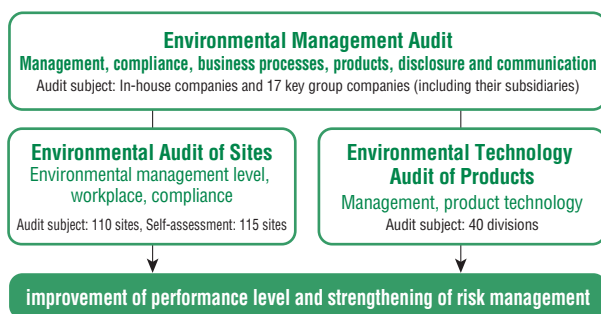
Toshiba Group uses the Environmental Management Information System for management of the Group's environmental data. In fiscal 2006, the scope of this system was expanded to include aggregation of environmental accounting data of Toshiba Corp. and its 519 consolidated subsidiaries and New EASTER audit results, enabling integrated management of all Toshiba Group's environment-related data.

### Raising environmental awareness of employees and their families

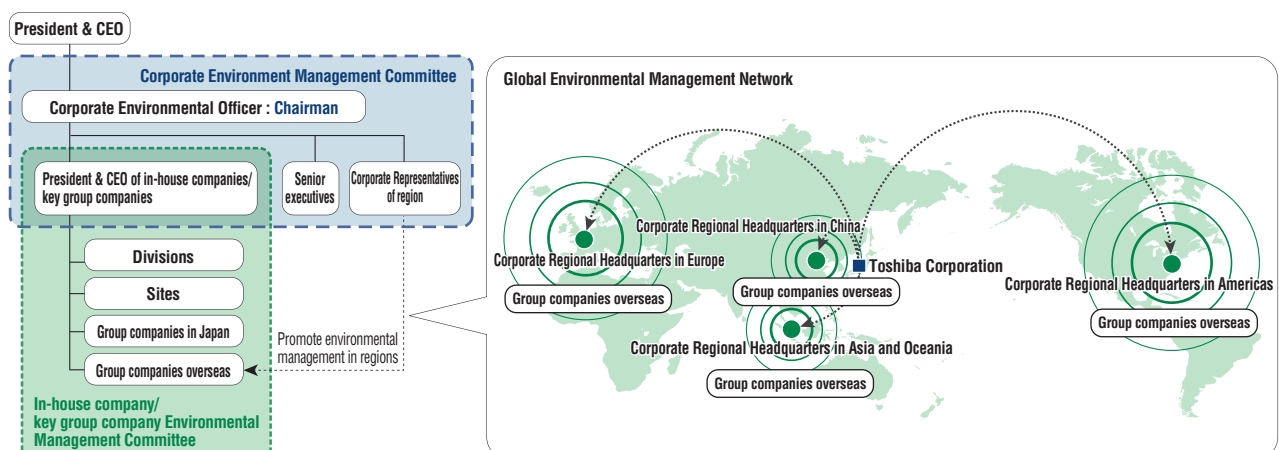
In order to enhance the level of environmental activities, all Toshiba employees receive environmental education according to their positions, tasks and specialties. The curriculum consists of stratified education programs, general environmental education, specialty education, and education for ISO 14001.

In fiscal 2006, we started activities to raise the awareness of employees and their families encouraging them to keep track of household's environmental impacts using web system. In March 2007, in recognition of this effort, Toshiba received the Silver Award of the Eco Family Project of the Minister of the Environment in Japan.

### Toshiba Environmental Audit System



### Organizational Chart of Toshiba Group's Environmental Management Structure



# Targets and Results

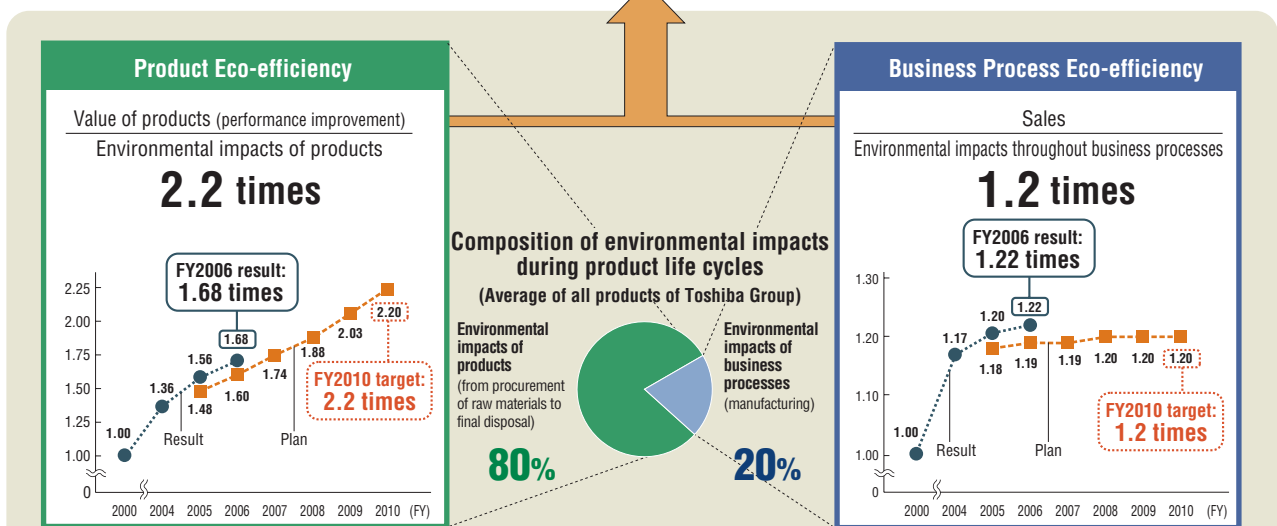
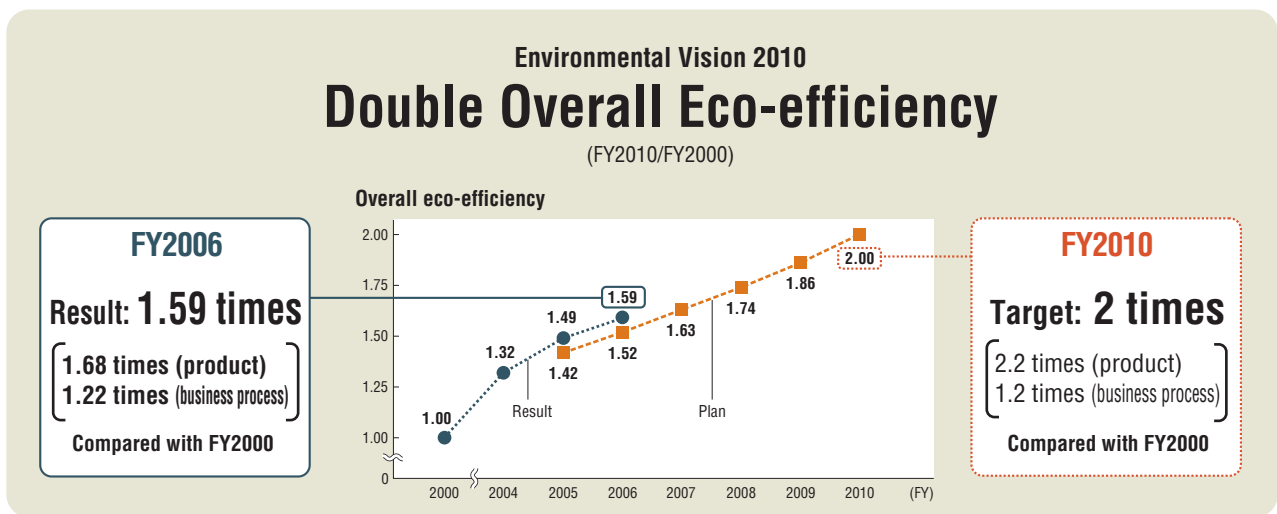
## Implementing the Fourth Voluntary Environmental Plan to achieve the goals of Environmental Vision 2010.

### Environmental Vision 2010

#### Enhancing eco-efficiency

Environmental Vision 2010 seeks to enhance overall eco-efficiency throughout products and business processes. While minimizing the environmental impacts of products

and business activities, we aim to enhance the value delivered by products to customers and expand sales. In fiscal 2006, compared with fiscal 2000, product eco-efficiency and business process eco-efficiency improved and were 1.68 times and 1.22 times respectively, and overall eco-efficiency was 1.59 times.



**When the two eco-efficiency targets are attained, doubling of the overall eco-efficiency will be achieved.**

**Product eco-efficiency (2.2 times) x 0.8 + Business process eco-efficiency (1.2 times) x 0.2 = Doubling of overall eco-efficiency (=2.0)**

Environmental impacts in the life cycles of Toshiba Group's products can be classified into two categories, namely, those attributable to products and those attributable to business processes, and the composition is as shown in the above graph. By taking the ratio into consideration, targets of

product eco-efficiency and business process eco-efficiency were determined to be 2.2 times and 1.2 times, respectively. The weighted average of 2.2 times and 1.2 times is 2 times, which is the target for overall eco-efficiency.



## Fourth Voluntary Environmental Plan and Target Achievement Level

### 520 Group companies move forward with the plan

Starting with the First Voluntary Environmental Plan formulated in fiscal 1993, Toshiba Group has expanded the scope to cover more sites and business processes while setting increasingly tough targets with each successive plan. The Fourth Voluntary Environmental Plan covering

the period from fiscal 2005 to fiscal 2010 provides concrete targets for improvement of product eco-efficiency and business process innovation in order to achieve Environmental Vision 2010.

Regarding results, we did not achieve targets for business process innovation, namely, in Management of Chemicals and Optimization of Resources in fiscal 2006. We have revised targets for fiscal 2007 and are advancing toward the achievement of goals for 2010.

### Fourth Voluntary Environmental Plan and Fiscal 2006 Target Achievement Level

Enhancement of product eco-efficiency	Indicator	FY2006			FY2007 target	FY2008 target	FY2010 target	
		Target	Result	Evaluation				
Provision of Environmentally Conscious Products (ECPs)	Provision of ECPs	Ratio of ECPs to net sales	20%	27%	7% points greater than the target (achieved)	30%	40%	Increase to 60%
	The ECP ratio increased for digital products. Electronic devices and social infrastructure systems lagged. We will focus on increasing the ECP ratios for these fields.							
Abolition of use of certain chemical substances	15 substance groups contained in products*1	40%*2	48%*2	8% points greater (achieved)	60%	80%	Complete abolition	
		For 15 substance groups, including 6 substances banned by the EU RoHS Directive, progress was made toward abolition of use in electronic devices and digital products. We will step up our efforts, particularly in social infrastructure systems, in order to achieve complete abolition of use in FY2010.						

\*1 15 substance groups subject to restriction: bis (tributyl tin) oxide (TBTO), tributyl tins (TBTs), triphenyl tins (TPTs), polychlorinated biphenyls (PCBs), polychlorinated naphthalenes (PCNs with 3 or more chlorines), short-chain chlorinated paraffins, asbestos, azo colorants, ozone-depleting substances, radioactive substances, cadmium and its compounds, hexavalent chromium compounds, lead and its compounds, mercury and its compounds, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDEs). (Detailed definitions and specific applications to be excluded are specified separately.)

\*2 Ratio of sales of products that do not contain any of the 15 substance groups to sales of all products

Business process innovation	Indicator	FY2006			FY2007 target	FY2008 target	FY2010 target	
		Target	Result	Evaluation				
Mitigation of Climate Change	Reduction of energy-originated CO <sub>2</sub> emissions	Emission rate*3	29% reduction	37% reduction	8% points greater	30% reduction	30% reduction	25% reduction
		Manufacturing sites in Japan	31% reduction	40% reduction	9% points greater	37% reduction	37% reduction	25% reduction
	Implementation of energy-saving measures such as introduction of highly energy-efficient clean rooms led to an excellent result.							
	Reduction of greenhouse gas emissions (other than CO <sub>2</sub> )	Total emissions	29% reduction	32% reduction	3% points greater	33% reduction	34% reduction	35% reduction
Additional greenhouse gas emissions caused by newly installed production lines were suppressed by the introduction of gas scrubbers.								
Reduction of CO <sub>2</sub> emissions associated with product logistics	Emission rate	29% reduction	34% reduction	5% points greater	35% reduction	36% reduction	25% reduction	
		Able to save energy by improving efficiency in logistics						
Management of Chemicals	Reduction of total emissions of chemical substances to air and water	Total emissions	30% reduction	19% reduction	11% points lower (not achieved)	23% reduction	35% reduction	50% reduction
		Emissions increased due to unexpected increase in production output. Specific technical measures and installation of equipment for recovery and removal of emissions were executed as planned.						
Optimization of Resources	Reduction in the total amount of waste generated	Rate of the total amount of waste generated	15% reduction	31% reduction	16% points greater (achieved)	24% reduction	23% reduction	20% reduction
		Regardless of the increase in the production output, FY 2006 achieved reduction in the generation of waste by 3k tons compared with FY2005, owing to individual sites' efforts.						
	Reduction in the amount of waste for final disposal	Final disposal rate (Sites achieving zero emissions of waste*4)	40%	38%	2% points lower (not achieved)	46%	60%	Achievement of zero emissions at all sites
Although the final waste disposal was reduced by 1.5K tons, the target rate of sites achieving zero emissions of waste was not reached due to the increase in the number of sites resulting from the expansion of the scope of consolidation.								
Reuse and recycling of products	Amount of recycling of used products*5	Increase to 145%	Increase to 147%	2% points greater (achieved)	154%	158%	Increase to 160%	
		In addition to the establishment and operation of recovery schemes in Japan, we will continue our efforts in response to the WEEE Directive.						

Unless otherwise specified, the targets are based on comparison with FY2000 and cover manufacturing and non-manufacturing sites worldwide.

For the purpose of evaluating activities, rates used as indicators are based on physical amount (net output).

Net output = Nominal output in Japan / Corporate goods price index (electrical equipment) announced by the Bank of Japan for each year (the index for 1990 is 1) + Nominal output overseas

\*3 : Compared with FY1990

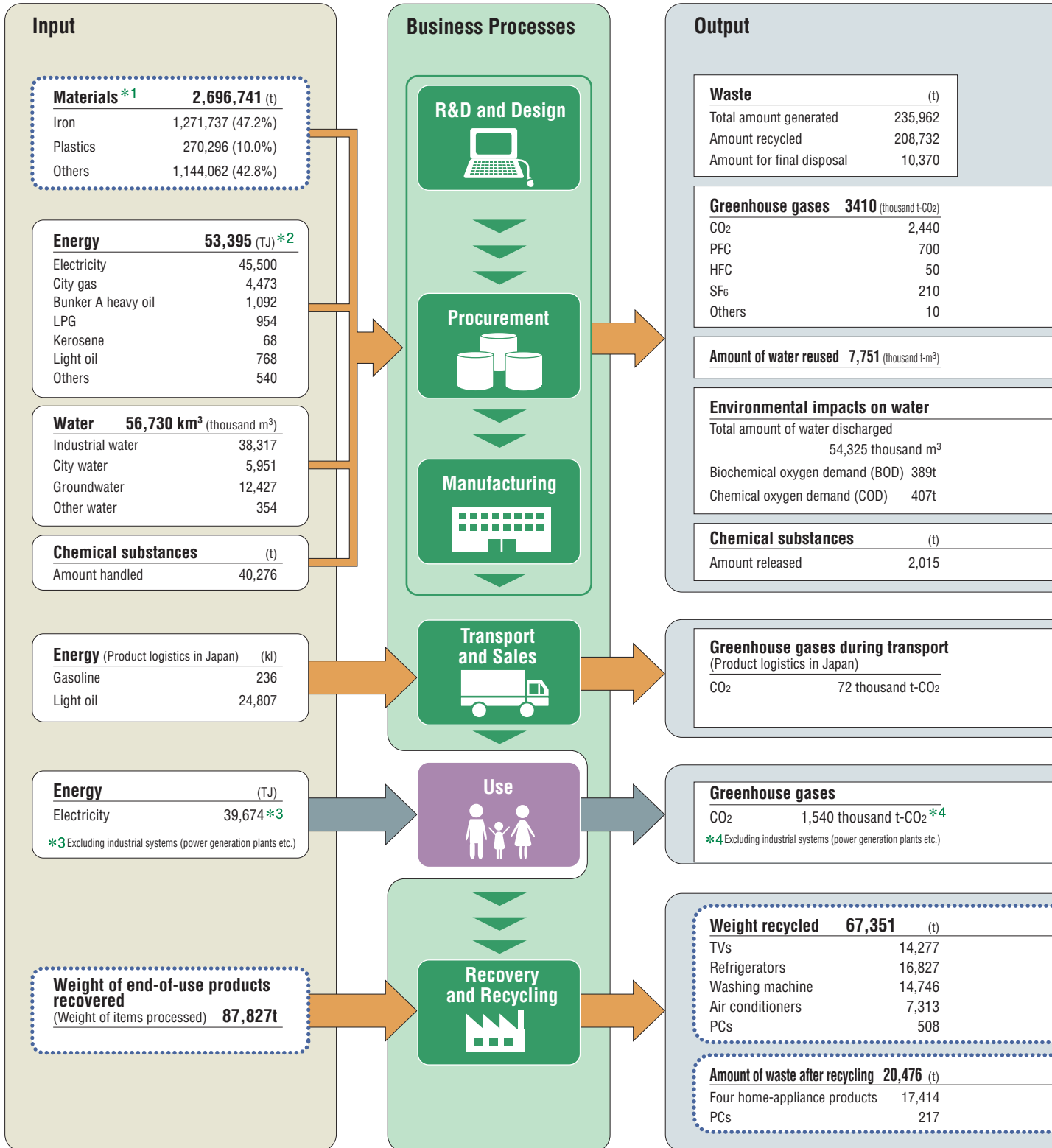
\*4 : Toshiba Group's definition of zero emissions of waste is that the amount of waste for landfill after treatment is equivalent to 1% or less of the total amount of by-products and other items generated (total amount of waste discharged) as a result of business activities.

\*5 : Compared with FY2001 (year in which the Home Appliance Recycling Law came into force in Japan)



# Environmental Impacts at a Glance

Toshiba Group's products and services range from home appliances and digital products to electronic devices and social infrastructure systems. We collect data and analyze environmental impacts throughout the Group in order to enhance eco-efficiency.



\*1 Material inputs by resource are calculated based on the Estimation method for Material Inputs using Input-Output Table (EMIoT®), a method developed by Toshiba. (EMIoT® is a registered trademark of Toshiba in Japan.)

\*2 TJ=1012J. Joule is a unit of work done or energy expended as heat or as electricity. 1J=approx. 0.239 calorie

Materials shipped as products, recycled and discharged as waste highlighted.

**Amount of major products shipped 496,474 (t)**

Notebook PCs, hard disk drives, TVs, mobile phones, Multi-Function Peripherals, POS terminals, refrigerators, washing machines, air conditioners, medical equipment, etc.

**Environmental impacts on air (t)**

SOx	447
NOx	1,023
Particles of soot	66

**Amount of water recycled 6,123 (thousand m<sup>3</sup>)**

Suspensoid (SS)	219t
Total nitrogen	259t

(t)	
Amount transferred	6,014

**Environmental impacts on the atmosphere during transport (t)**




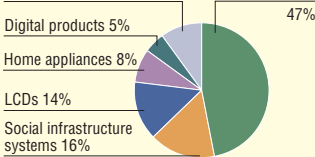


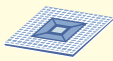









SOx	15
NOx	489
Particles of soot	55

(t)	
Medical equipment	4,953
Elevators/escalators	2,045
Multi-Function Peripherals/POS terminals	3,871
Mail sorting systems	2,811

(t)	
Medical equipment etc.	884t
Other	1,960t

**Characteristics of Toshiba Group's Environmental Impacts and Countermeasures**

From the next page onward, countermeasures for businesses and products with large environmental impacts are introduced.

	Environmental impacts	Major countermeasures
<b>R&amp;D and Design</b>  <b>Procurement</b>  <b>Manufacturing</b> 	<p><b>Chemicals</b> Various chemical substances are used in products.</p> <p><b>Greenhouse gases</b> CO<sub>2</sub> emissions during semiconductor manufacturing are large.</p> <p><b>Composition of CO<sub>2</sub> emissions by product field</b></p>  <p><b>A lot of plastics are used for products.</b></p>	<p>Changed materials of digital products and mobile phones ▶ P49 </p> <p>Reduced VOC emissions at LCD plants ▶ P50 </p> <p>Promoted energy saving at semiconductor plants ▶ P48 </p> <p>Adopted plant-based plastics to reduce environmental impacts throughout product lifecycles ▶ P47 </p>
	<p><b>Transport and Sales</b>    <b>Use</b>  </p> <p><b>Greenhouse gases</b> Many products consume energy during the usage phase.</p>	<p>Greatly enhanced heat efficiency of thermal power plants ▶ P46 </p> <p>Reduced CO<sub>2</sub> emissions of heat source equipment for commercial air-conditioning systems by 31% ▶ P46 </p> <p>Halved electricity and water consumption of washing machines with drier ▶ P46 </p>
	<p><b>Recovery and Recycling</b>  </p> <p><b>E-waste</b> Due to the high-volume of production, when disposed, environmental impacts are large.</p>	<p>Reduced the amount of materials used for medical equipment and AV products ▶ P51 </p> <p>Promoted global recycling of PCs ▶ P52 </p>

# Mitigation of Climate Change

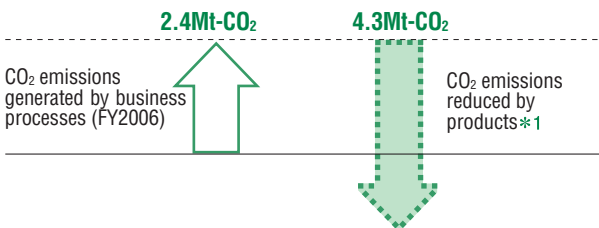
## Energy-Saving Products and Business Activities Reduce CO<sub>2</sub> Emissions and Other Greenhouse Gases

### Reduction of CO<sub>2</sub> Emissions during Product Usage

#### More environmentally conscious products

Most Toshiba Group products ranging from home appliances to power plants consume electricity not only during the manufacturing phase but also during the usage phase. Considering the sales volumes and the number of operating years of such products, CO<sub>2</sub> emissions attributable to products are enormous. Recognizing this fact, as a measure to mitigate global warming, Toshiba Group is emphasizing development of environmentally conscious products with minimal environmental impacts throughout their life cycles from design and manufacturing through to usage and disposal. It is estimated that the reduction in CO<sub>2</sub> emissions attributable to environmentally conscious products is far greater than the amount of energy-derived CO<sub>2</sub> emissions attributable to business activities.

#### Reduction of CO<sub>2</sub> Emissions by Environmentally Conscious Products (Estimate)



\*1 Calculated by converting the energy-saving benefit, which would be achieved if all products shipped by Toshiba Group in fiscal 2000 were replaced by products shipped in fiscal 2006, to CO<sub>2</sub> emissions (per year) of the products throughout the life cycle (exclude energy supply products such as power plants)

#### Reduced energy consumption during usage

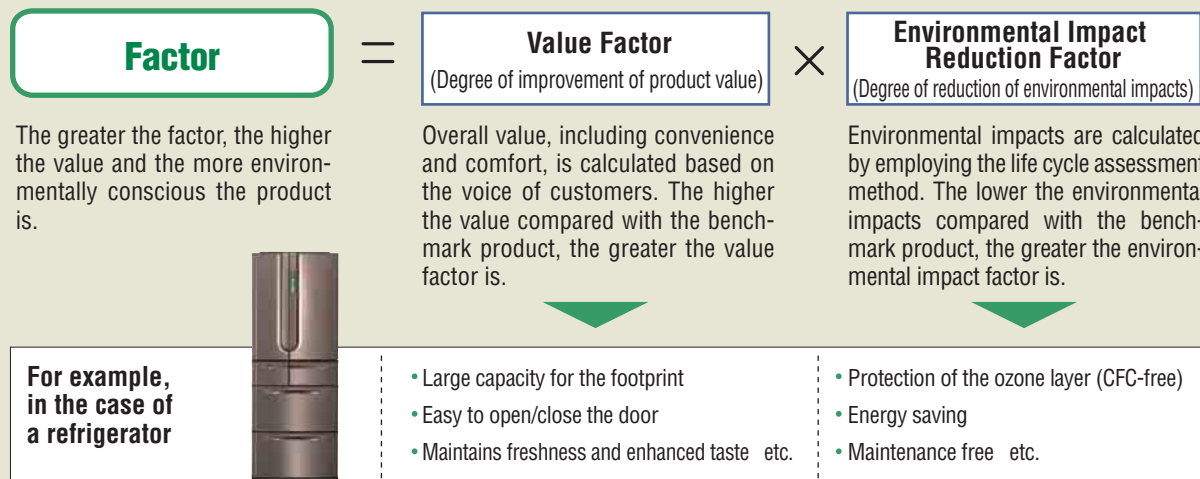
CO<sub>2</sub> emissions during the usage phase account for the greatest proportion of Toshiba Group products' CO<sub>2</sub> emissions throughout their life cycles from design and manufacturing through to usage and disposal. For example, in the case of digital products, 60% of CO<sub>2</sub> emissions occur during the usage phase, with the figure rising to 80% for home appliances and social infrastructure systems. In view of this fact, Toshiba Group has been tackling reduction of energy consumption of products during usage by setting annual targets since the launch of the Second Voluntary Environmental Plan in fiscal 1996.

The Fourth Voluntary Environmental Plan launched in fiscal 2005 emphasizes mitigation of climate change, management of chemical substances, and optimization of resources, making use of Toshiba's unique eco-efficiency indicator based on the "factor"\*2 concept. "Factor" is a term used for indicating the degree of improvement of the value or reduction of environmental impacts and is a ratio of eco-efficiency of a new product (product subject to assessment) to that of a previous product (benchmark product). At Toshiba all activities undertaken to create environmentally conscious products with the aim of improving factors are collectively referred to as "Factor T," with the T standing for "Toshiba."

\*2 Factor : An indicator originally developed by the Wuppertal Institute for Climate, Environment and Energy in Germany. Factor 4 and Factor 10 are well-known concepts that have been proposed.

### Toshiba Group's Factor Is the Value Factor of Product multiplied by Environmental Impact Reduction Factor

The greater the value factor and the environmental impact reduction factor of a product, the greater the contribution the product can make to a higher quality of life. Case studies on pages 46 to 52 include factors of the products introduced.





## 31% Reduction\*3 of CO<sub>2</sub> Emissions of Heat Source Equipment for Building Air-Conditioning

Case Study

### Super Flex Modular Chiller Heat Source Equipment for Air-Conditioning of Large Facilities

Joint development partners: Tokyo Electric Power Company, Toshiba Carrier Air Conditioning Systems Corporation

The 2006 revision to the energy conservation law includes recommendations concerning large facilities such as commercial buildings, factories, and public facilities to improve their energy management and to introduce high-efficiency equipment. For the air-conditioning systems of these large facilities, absorption chillers/heaters are widely used as the heat source equipment and reduction of the power consumption of this equipment is a major issue.

This highly efficient air-cooling heat pump chiller\*4 provides a solution. If all absorption chillers/heaters installed in Japan as of fiscal 2005 were to be replaced by this product, CO<sub>2</sub> emissions could be reduced by up to 17 million tons per year, which is equivalent to 10% of CO<sub>2</sub> emissions from all households in Japan (168 million tons in fiscal 2004).

\*3 Compared with Toshiba's conventional model, the RUA-SB35501H (3 units)

\*4 Heat pump chiller: Equipment for heating/cooling water used for air-conditioning



1 module

Connect the necessary number of modules according to the size of the building to cut unnecessary electricity consumption. Up to 12 modules can be connected.

(Suitable for buildings with a total floor area of 10,000 to 30,000m<sup>2</sup>.)

Factor **2.18**

FY2006/FY2000

Value factor **1.50**

Environmental impact reduction factor **1.45**

## Consumption of Electricity and Water Cut 50% for a Washing Machine with Drier

Case Study

### Air-conditioner Cycle Drum TW-2500VC Washing Machine with Drier

The demand for washing machines with driers is rising because they are convenient and save space. However, the drying cycle consumes a lot of electricity and requires a lot of cooling water.

This prompted Toshiba Group to develop a product with reduced environmental impacts during the drying cycle. Adoption of dehumidifying drying using a heat pump slashed power consumption to half compared with conventional water-cooling dehumidifying using a heater. The need for cooling water during drying is eliminated. Moreover, the time required for drying is reduced owing to the improved spin-dry function as a result of the adoption of an innovative motor developed by Toshiba.

Power consumption

3,000Wh ▶ 1,600Wh

Water consumption

125ℓ ▶ 64ℓ

(Compared with the conventional model. When the washing machine is operated with the rated drying capacity of 6.0kg from washing to drying)



Factor **2.93**

FY2006/FY2000

Value factor **1.42**

Environmental impact reduction factor **2.06**

## Greatly Enhanced Heat Efficiency of Thermal Power Plant

Case Study



### 1,500°C Class Combined Cycle Thermal Power Plant

By using steam instead of air for cooling the high-temperature unit of a gas turbine, the gas turbine inlet temperature is maintained at 1,500°C, instead of the conventional 1,300°C. As a result, heat efficiency has been enhanced greatly, which translates into a reduction of 1 million tons in CO<sub>2</sub> emissions per power plant each year compared with a conventional oil-fired thermal power plant.





## Reduction of Greenhouse Gas Emissions Generated by Business Activities

### Aiming to reduce emissions of all types of greenhouse gases

Greenhouse gases emitted in the course of business activities include not only energy-originated CO<sub>2</sub> but also other greenhouse gases used in manufacturing processes and logistics related to raw materials and products. Having set targets and an action plan for reduction of all these greenhouse gas emissions, we are now proceeding along as planned.

### Minimizing the impact of increased energy consumption

In order to reduce CO<sub>2</sub> emissions attributable to energy consumption, we are working to save energy by improving energy management at factories as well as at laboratories and offices and by means of capital investment in facilities. In fiscal 2006 Toshiba Group's energy-originated CO<sub>2</sub> emissions increased 5% compared with fiscal 2005. This was mainly attributable to new clean rooms for manufacturing semiconductors and LCDs. We minimized

the impact by introducing energy-saving clean rooms. Although expansion of the semiconductor and LCD businesses is expected to lead to increased energy consumption, we intend to achieve the target for fiscal 2010 by implementing energy-saving measures.

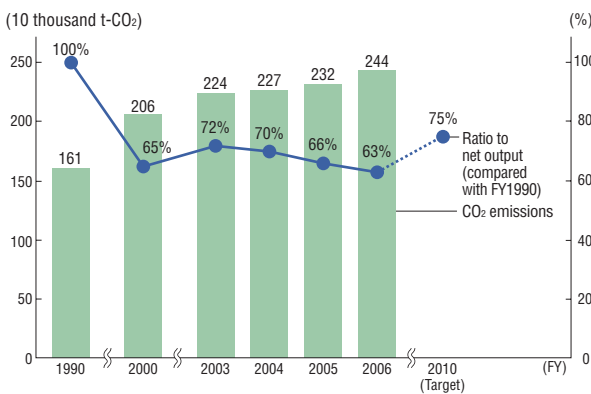
### Reducing other greenhouse gases

Regarding the six types of greenhouse gases subject to the Kyoto Protocol\*1, our measures against CFCs whose greenhouse effects are high include introduction of gas scrubbers on top of efforts to reduce consumption and replacement with harmless alternatives.

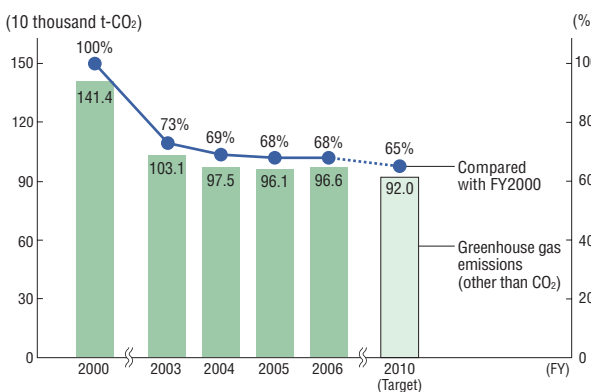
Thanks to installation of gas scrubbers at all new production lines, emissions of greenhouse gases other than CO<sub>2</sub> were 32% lower in fiscal 2006 compared with fiscal 2000, but their emissions increased compared with the previous year in line with the rising production of semiconductors and LCDs. We intend to introduce gas scrubbers at existing lines and shift to use of alternatives in order to achieve the target for fiscal 2010.

\*1 Six types of greenhouse gases subject to the Kyoto Protocol: Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), dinitrogen monoxide (N<sub>2</sub>O) (nitrous oxide), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). PFCs and HFCs are collectively referred to as CFCs.

### CO<sub>2</sub> Emissions and Ratio



### Greenhouse Gas Emissions Other Than CO<sub>2</sub>



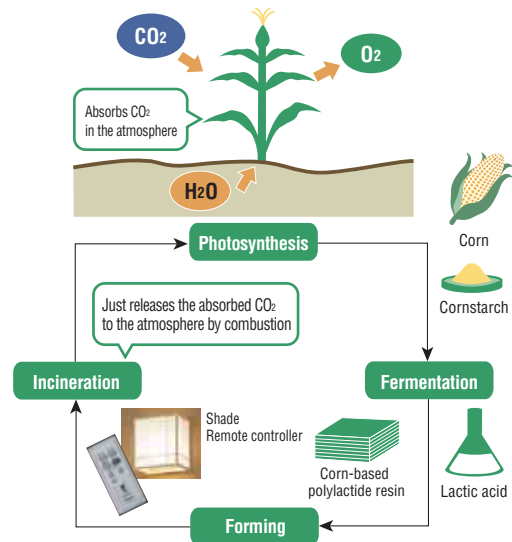
### Reducing Environmental Impacts throughout Life Cycle using Plant-based Plastics

Toshiba Home Lighting Corporation

Case Study

Use of plant-based plastics instead of oil-based plastics for the shade of Japanese-style lighting equipment and the part of the mainbody of remote controller results in reduction of CO<sub>2</sub> emissions.

### Cycle of Plant-based Plastics



## Energy-saving Semiconductor Manufacturing Plant

Oita Operations, Toshiba Corporation

Case Study

Clean rooms at semiconductor manufacturing plants use a lot of steam for humidifying in order to maintain a consistent level of humidity. Toshiba sought to reduce the consumption of city gas used for generating steam by changing the outdoor unit's humidifying method to a pure water drip method that dispenses with the use of steam.

With this new system, great energy saving was achieved by efficient use of waste heat generated at the plant as the heat source for heating pure water. For this achievement Oita Operations received the Director-General of the Agency for Natural Resources and Energy Prize in Japan for Successful Case of Energy Conservation in Factory & Building.



(l to r) Hiroyuki Goto, Koji Gohyakuji, Yujiro Sakai, and Shinji Goto  
Facilities Management Group,  
Facilities Management Department,  
Oita Operations, Toshiba Corporation



Clean Room

### Improvement Measures and Effect

Improvement measure	energy saved (t-CO <sub>2</sub> )	Effect (million yen)
Reduction of steam consumption owing to the change of the humidifying method	1,545	36.3
Energy saving of pure water equipment (greater recovery of waste heat from the refrigerator)	477	9.8
Energy saving of pure water equipment (recovery of waste heat from the manufacturing equipment)	326	6.7
<b>Total</b>	<b>2,348</b>	<b>52.8</b>

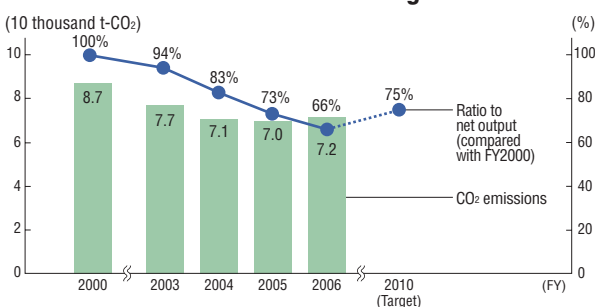
### Energy saving in logistics

Toshiba Group companies are collaborating with Toshiba Logistics Corp. to save energy during transportation of products.

In fiscal 2006, although CO<sub>2</sub> emissions attributable to logistics increased 3% year on year owing to the increased production, the annual target of the ratio compared to fiscal 2000 was attained as a result of optimization of transport means including modal shift, improvement of load efficiency, and efficient deployment of distribution centers.

We are promoting modal shift from transport by trucks to rail container transport. In fiscal 2006 transport of PCs from Shanghai, China, to Kyushu, Japan was partially switched from air to marine transport. As a result of modal shift, we reduced CO<sub>2</sub> emissions 564 tons in fiscal 2006.

### CO<sub>2</sub> Emissions Attributable to Logistics



### Using renewable energy

In order to facilitate the use of renewable energy, in January 2005 Toshiba entered into a contract to purchase electricity generated using renewable energy under a green power certificate system\*2. In accordance with the contract, at least 4% of the electricity demand at the Toshiba headquarters building is met by biomass power generation.

\*2 Green power certificate system: A system under which a purchaser is supplied with electricity produced by renewable energy power generation and a green power certificate is issued to the purchaser.

### Responding to Stakeholders

#### Is Toshiba Involved in the Clean Development Mechanism (CDM\*3)?

Source: Interest Survey conducted prior to the editing of this report (▶P4)

Toshiba Group's measures to mitigate climate change are twofold: minimization of the increase in CO<sub>2</sub> emissions attributable to business activities and reduction of CO<sub>2</sub> emissions throughout product life cycles. We are considering CDM as a part of measures to suppress CO<sub>2</sub> emissions attributable to business activities. Having invested in the Japan GHG Reduction Fund in December 2004, we are cooperating with greenhouse gas emissions reduction projects around the world.

\*3 CDM : Clean Development Mechanism. A scheme allowing industrialized countries with a greenhouse gas reduction commitment to invest in emission reducing projects in developing countries as an alternative to emission reductions in their own countries.



# Management of Chemicals

## Aiming to Ensure Customer's Confidence with Product Use and to Prevent Release of Hazardous Chemicals from Manufacturing Processes

### Management of Chemicals in Products

#### Abolition of use of certain chemicals

In order to secure product safety and ensure hazardous substances are not released, Toshiba Group is working to abolish use of certain chemical substances that are harmful to human health regardless of lack of full scientific certainty, in accordance with the precautionary principles. Toshiba Group ceased use of the six substances banned by the RoHS Directive\*1 in all products released since April 2005, achieving full compliance with the RoHS Directive by July 2006 when it came into force.

The Fourth Voluntary Environmental Plan launched in fiscal 2005 calls for abolition of the use of 15 substance groups by fiscal 2010, including ozone-depleting substances, tributyl tins (TBTs) and polybrominated biphenyls (PBBs). In fiscal 2006, the second year of the plan, the ratio of products free from these 15 substance groups increased from 28% for the previous year to 48%.

\*1 RoHS Directive: European Union Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment. It bans the presence of six substances, namely, lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDEs), in products marketed in the EU from July 2006 onward.

#### Green Procurement Guidelines revised

We extensively revised the Green Procurement Guidelines in November 2006 to strengthen management of chemical substances in products. In this revision, besides 34 substance groups that must not be present in procurement items, we defined 20 substance groups, including polyvinyl chloride (PVC\*2) and brominated flame retardants (other than PBBs or PBDEs) as "substances whose use is to be reduced or to be substituted by alternative substances or substances for which a closed system is to be adopted for recovery and detoxification". Of these substance groups, 24 substance groups specified by the Joint Industry Guide (JIG\*3) are subject to procurement item chemical content surveys. Survey results are used as the basis for certifying new procurement items and determining whether the existing procurement items should be substituted or not.

\*2 PVC : Polyvinyl Chloride

\*3 JIG : A set of common guidelines issued as the result of agreement between Japanese, U.S., and European industry bodies, which are, respectively, the Green Procurement Survey Standardization Initiative, the Electronic Industries Alliance, and the European Information, Communications and Consumer Electronics Technology Industry Associations. The official name is "The Joint Industry Guide for Material Composition Declaration for Electronic Products".

### Change of Materials for Digital Products and Mobile Phones

Case Study

#### Dramatic reduction in chemicals Digital MFP e-STUDIO 165

Halogen-free\*4 recycled plastics are used for the cover unit and other plastic parts, accounting for 56% of all plastics used in this product. Hazardous chemicals are reduced in various ways. [Compliance with the RoHS Directive]

- Extensive use of recycled plastics
- Lead-free soldering (printed circuit board)
- Abolition of hexavalent chromium plating (steel plate and screws)
- Use of PVC-free power cable\*4



\*4 Japanese Model

$$\text{Factor } \mathbf{2.19} = \text{Value factor } \mathbf{1.47} \times \text{Environmental impact reduction factor } \mathbf{1.49}$$

FY2006/FY2000

#### Replacement of PVC 3G mobile phone

We replaced PVC used for undercoat with high-intensity aluminum without compromising the performance



$$\text{Factor } \mathbf{3.36} = \text{Value factor } \mathbf{5.72} \times \text{Environmental impact reduction factor } \mathbf{0.59}$$

FY2006/FY2000

#### Abolition of use of halogenated flame retardants 0.85" HDD MK8003MTD

We abolished the use of halogenated flame retardants for this HDD, including in LSIs, connectors, and parts mounted on the printed circuit board.



$$\text{Factor } \mathbf{5.43} = \text{Value factor } \mathbf{3.62} \times \text{Environmental impact reduction factor } \mathbf{1.50}$$

FY2006/FY2000

## Management of Chemicals in Manufacturing Processes

### Reduction target for fiscal 2006 not attained

Toshiba's management of chemicals is based on three policies: avoid use of hazardous substances to the maximum extent possible, promote reduction and substitution to the maximum extent possible, and subject use to appropriate controls. Toshiba classifies some 2,000 substances covered by the PRTR Law of Japan and other environment-related laws and regulations into three ranks (prohibition of use, reduction in use, control of release).

For substances subject to reduction in use in accordance with Toshiba's criteria, we are also focusing on reducing their release as it has a significant direct impact on the environment. Measures implemented in fiscal 2006 included use of water-soluble solvent as a substitute in the phosphor coating process, introduction of volatile organic compound (VOC) abatement systems in the resist coating process, and introduction of low voc compressor electrodeposition coating. However, because the amount of the targeted substances handled rose in line with unforeseen increase in production, we did not achieve the target for fiscal 2006, which was a 30%

reduction in the amount released compared with the result for fiscal 2000. In fiscal 2007, we intend to further promote substitution, process changes, and introduction of abatement systems.

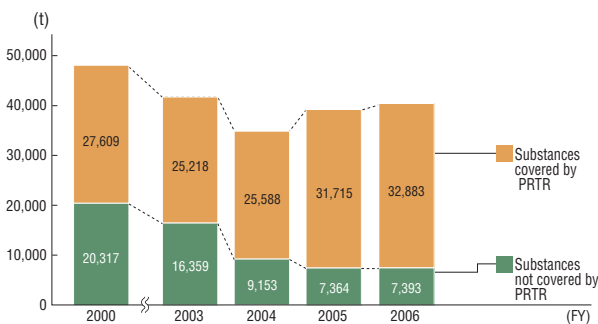
Also, we have proactively included VOCs in the substances subject to reduction in use and have started reducing their use.

### Continuous improvement around the world to prevent soil and groundwater pollution

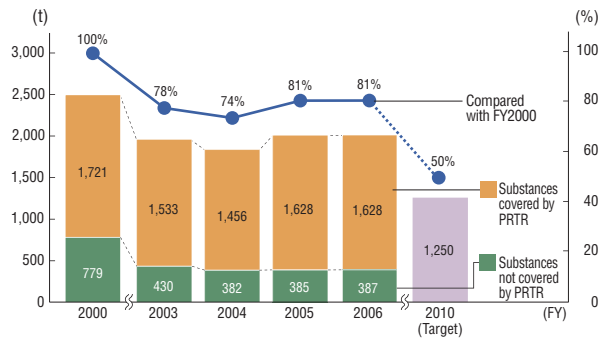
In order to prevent environmental pollution caused by leakage of chemicals, Toshiba has its own guidelines for structural design of environmental facilities, such as wastewater treatment facilities, which are applied at sites around the world.

In the same scope, we assess the pollution risk of sites based on the history of the land use and the results of environmental assessment when establishing new sites or changing the use of existing sites. We ensure compliance with the laws and regulations of the countries where sites are located. In countries where a regulatory framework is not established, it is our policy to apply stringent voluntary standards.

### Amount Handled of Substances Subject to Reduction



### Amount Released of Substances Subject to Reduction



### Reduction of VOC Release at an LCD Plant

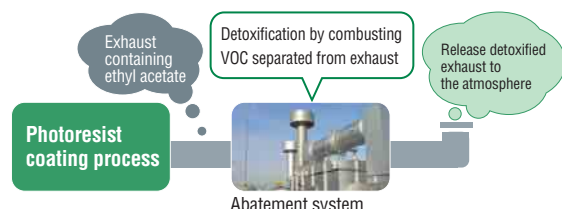
### TFPD Corporation Case Study

Ethyl acetate used in the LCD manufacturing process is a VOC. Because it vaporizes when heated, ethyl acetate is released to the atmosphere in exhaust. So, as a measure to reduce its release, we have installed an abatement system at the exhaust outlet. With this system, after adsorptive enrichment of ethyl acetate in the exhaust by active carbon, detached gases are combusted for detoxification. Introduction of the abatement system reduced VOC release by 85%.



Yoshinori Hashimoto  
 Engineering and Environment Group  
 Administrations Department  
 TFPD Corporation

### VOC Release in the coating process





# Optimization of Resources

## Efficient Use of Resources throughout the Product Life Cycle from Design to Disposal

### Resource Saving Product Design and Recycling

#### Optimization of resources pursued from the product design phase

Development of lighter products and robust products with longer lives saves resources. At Toshiba Group, as well as resource-saving design, we are emphasizing greater use of modules so that repairs and upgrades of products are performed simply by replacing modules. Reduction of the number of parts to facilitate disassembly and recycling is another priority.

Also, we are promoting use of recycled resources in products. For example, 1,800 tons of recycled plastics was used in the manufacture of Toshiba washing machines, Multi-Function Peripherals (MFPs), and other products in fiscal 2006.

#### Measures for efficient use of packaging materials

Previously, efficient use of packaging materials was a theme addressed by individual Toshiba Group sites. In order to lead an accelerated, concerted effort on this theme throughout Toshiba Group, we set up a working group in June 2006. To achieve the targeted 10% reduction (ratio to production output) in the amount of packaging materials distributed in Japan by fiscal 2010 compared with fiscal 2005, the working group is promoting sharing of information on best practice and innovative packaging technologies.

### Reduction of the Amount of Materials Used in Medical Equipment and AV Products

Case Study

#### Diagnostic ultrasound system is fruit of resource-saving design concept Material input for the frame reduced to one fourth

Diagnostic ultrasound systems capture in vivo images using ultrasound. This high-performance model, which offers sophisticated functions owing to the adoption of large-scale FPGA, \*is the fruit of resource-saving design.



- 37% reduction in the volume of the main unit
- Frame
  - Reduced parts count
  - Material input reduced to one fourth

#### Resource-saving Effects of the Frame

	Conventional model	New model	reduction
Material input	75.1kg	18.2kg	75%
Product weight	43.4kg	16.1kg	63%
Effective material usage rate (product weight/material input)	58%	88%	-
Parts count	55	27	51%
Number of printed circuit boards	10	8	20%

Factor **2.77**

FY2006/FY2000

$$\text{Value factor } 1.86 \times \text{Environmental impact reduction factor } 1.49$$

#### HD DVD player HD-XF2 Reduced use of materials

- 54% reduction in the weight of the main unit
- 60% reduction in the weight of packaging materials
- 45% reduction in the volume of the main unit
- 38% reduction in the printed circuit board area (compared with the previous model)



Factor **2.11**

FY2006/FY2000

$$\text{Value factor } 1.11 \times \text{Environmental impact reduction factor } 1.90$$

#### Robust, high-quality notebook PC with excellent durability dynabook satellite K17

- Protection of HDD from external shock
- Protection of LCD from external shock
- Prevention of infiltration of liquid through the keyboard
- 30% reduction in the number of screws by slide/hook fixing (compared with the previous model)



Factor **3.31**

FY2006/FY2000

$$\text{Value factor } 2.76 \times \text{Environmental impact reduction factor } 1.20$$

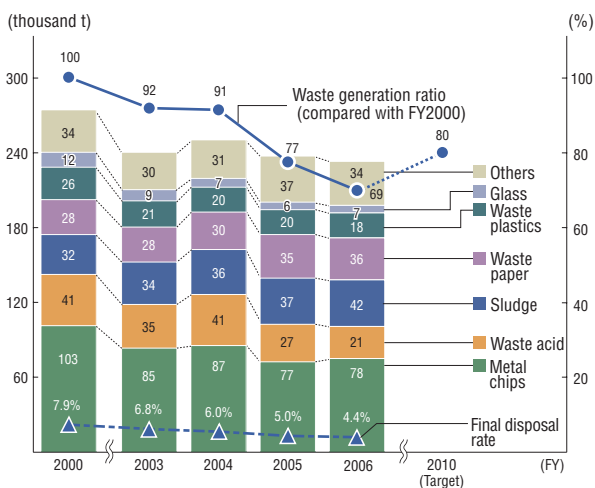
\*FPGA : Field Programmable Gate Array Integrated Circuit Device ; Additional feature can be implemented without any hardware (Printed Circuit Board) replacement.

## Waste Reduction and Recycling in Business Activities

### Zero emissions achieved by 38% of sites worldwide

In fiscal 2006, amid rising production of semiconductors and LCDs, we attained the annual waste reduction target by reducing by-products through increased recycling of cleansing solutions and minimization of redundant materials as a result of process improvements. Routine, low-key actions, including strict sorting of by-products and wider application of recycled materials in cooperation with waste treatment companies, also helped us to reduce the final disposal rate. Owing to these activities, 38% of all Toshiba Group sites worldwide achieved zero emissions. However, we did not attain the annual target (40%), mainly due to inclusion of sites that have not achieved zero emissions in the scope of consolidation. By continuing to implement a battery of measures to

### Total Amount of Waste Generated (Ratio) and Final Disposal Rate



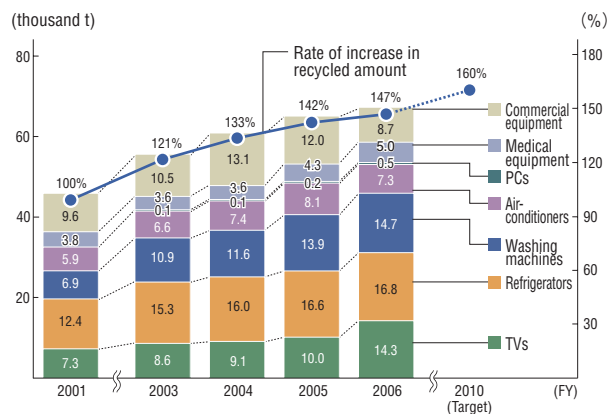
reduce generation of waste, we are determined to achieve zero emissions at all sites.

Also, we are raising the quality of recycling step by step, including expansion of the scope of material recycling.

### Recovery of end-of-use products and resource recycling

By promoting recovery of end-of-use products and material recycling, we are making a greater contribution to resource recycling with every passing year. In Japan, besides products covered by the Home Appliance Recycling Law and the Law for Promotion of Effective Utilization of Resources, we have established our own schemes for collecting medical equipment, elevators, and POS systems. In Europe, we are promoting recycling of end-of-use products to fulfill producer responsibility by ensuring compliance with the Directive on Waste Electrical and Electronic Equipment (WEEE Directive). In the US, we are engaged in voluntary recycling that goes beyond the legal requirements of individual states. In addition, implementation of recycling schemes in Asia/Oceania and China is underway.

### Amount of Materials Recycled from End-of-use Products



## Recycling of PCs Worldwide

### Toshiba America Information Systems, Inc.

#### Case Study

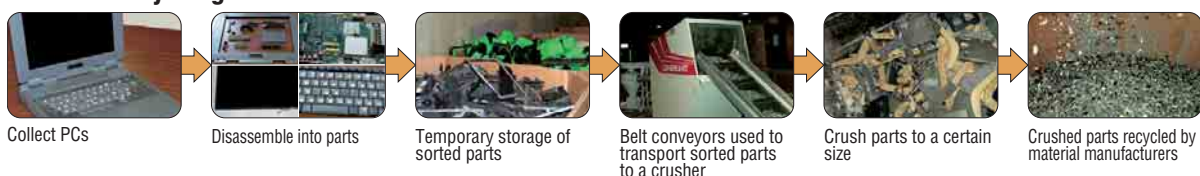
Toshiba America Information Systems, Inc. has put in place the Toshiba Trade-in and Recycling Program to facilitate recycling of notebook PCs.

We take back used PCs from consumers and contracted scrapping companies licensed by the U.S. Environmental Protection Agency disassemble them and recover metals and plastics for recycling. Toshiba Group intends to expand this program in Australia, China, and Singapore.



Christopher Harrington  
Toshiba America Information Systems, Inc.

### Flow of Recycling



# Environmental Communication

## Sharing of Information and Dialogue to Reflect Stakeholders' Views in Our Activities

### Diverse Communication

We welcome stakeholders' feedback via such events as Toshiba Group Environmental Exhibition, held annually since 1990. Also, we reach out to as many people as possible through environmental advertising.

Having joined Team Minus 6%, a national campaign to combat global warming, Toshiba sites in Japan are putting Cool Biz (dressing lightly in the summer) into practice and participate in the Light Down campaign, a nationwide event of turning off illumination and lighting of facilities and homes, thereby communicating Toshiba's environmental stance to visitors and people in local communities. Also, we promote dialogue with local communities through events during Environmental Month.



#### Exhibitions

Toshiba participates enthusiastically in exhibitions around the world. Photo: Toshiba's sustainability corner at IFA Berlin Show in Germany (September 2006)



#### Environmental advertising

Toshiba placed eight environmental ads in fiscal 2006, including ones featuring washing machines and outdoor units of air-conditioning equipment in Japan.



#### Forum

Toshiba disseminates environmental information in cooperation with local communities. Photo: C.W. Nicol, a writer and environmentalist, spoke at the Eco Forum jointly organized by Toshiba Solutions Corp. and Fuchu City, Japan (October 2006)

### External Evaluation of Toshiba's Environmental Technology

Toshiba Group is not only active in developing technologies and products that contribute to reduction of environmental impacts, but also emphasizes sharing of information on such technologies and products through exhibitions. Among recent developments, e-blue™ decolorable toner enabling reuse of office paper is highly regarded.

#### Major Awards of Toshiba's Environment-related Technologies and Products (Fiscal 2006 and 2007)

Award	Technology/Product
Minister of Economy, Trade and Industry Award, Energy Saving Grand Prize	Super Flex Modular Chiller heat source equipment for air-conditioning of large facilities
Chairman of the Energy Conservation Center Award, Energy Saving Grand Prize	Outdoor inverter freezer
The Japan Machinery Federation Chairman's Award, Excellent Energy-saving Equipment Commendation	Development and commercialization of a pump-turbine runner with splitter blades
Encouragement Award, Resource Recycling Technologies and Systems Commendation by the Clean Japan Center	Office paper reuse system using e-blue™ decolorable toner
Minister of the Environment Award, Environment Prize by the Nikkan Kogyo Shimbun and the Hitachi Environment Foundation	e-blue™ decolorable toner

### More Information on Toshiba's Commitment to the Environment is Available at the Toshiba Website



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

#### 1 : Environmental Management

- Toshiba Group's Environmental Management, Environmental Vision 2010
- Toshiba Group's Basic Policy for the Environment, Environmental management structure
- Environmental Management System (List of ISO 14001-certified sites)
- EASTER (Environmental Audit System in Toshiba on the basis of ECO Responsibility).
- Environmental Management Information System, Compliance with environment-related laws and regulations, Environmental education
- Environmental accounting
- Environmental awards
- Targets and results of environmental activities, Overview of environmental impacts

#### 2 : Reduction of Environmental Impacts of Products

- Development of environmentally conscious products
- Products and global warming; case studies
- Management of chemicals in products; case studies
- Optimization of Resources in products; case studies
- List of Toshiba Group's environmentally conscious products

#### 3 : Reduction of Environmental Impacts of Business Activities

- Mitigation of Climate Change
  - Reducing energy-originated CO<sub>2</sub> emissions
  - Reducing emissions of greenhouse gases other than CO<sub>2</sub>
  - Reducing CO<sub>2</sub> emissions attributable to logistics, using renewable energy
  - Case studies
- Management of chemicals
  - Substance ranking and control classifications
  - Reducing release of chemicals (PRTR data by site and by substance)
  - Reflecting VOC, Management of ozone-depleting substances, Management of PCBs
  - Preventing air and water pollution
  - Preventing soil and groundwater pollution
  - Case studies
- Optimization of resources
  - Reducing waste generated and waste for final disposal
  - Recycling of home appliances (4 products) and PCs and increasing the number of units recovered
  - Increasing the amount of end-of-use products recycled
  - Efficient utilization of water
  - Case studies

#### 4 : Environmental Communication

- Advertising; Exhibitions
- External evaluation
- Biodiversity
- Dialogue with stakeholders

#### 5 : Environmental Activities of Business Domains

- Environmental Activities of In-house Companies
- Environmental Activities of Group Companies in Japan
- Environmental Activities of Group Companies overseas

(As of June 2007)