TOSHIBA

Leading Innovation

# Environmental Report 2011

TOSHIBA eco style

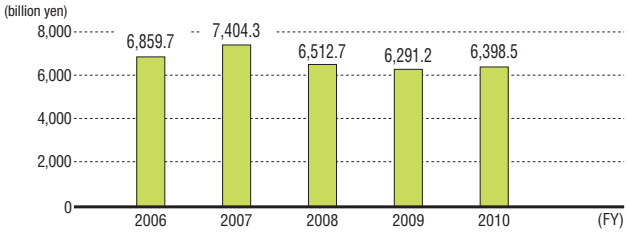
# Toshiba Group Business Overview

## Company Overview (as of March 31, 2011)

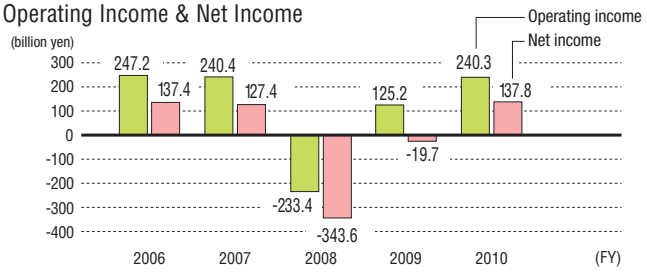
| | |
|---|---|
| Company name | Toshiba Corporation |
| Headquarters address | 1-1, Shibaura 1-chome, Minato-ku, Tokyo |
| Founded | July 1875 |
| Paid-in capital | 439.9 billion yen |
| Consolidated net sales | 6,398.5 billion yen |
| Number of employees (consolidated) | 202,638 |
| CSR-related international charters/ guidelines Toshiba endorses | United Nations Global Compact Global Reporting Initiative (GRI) |
| Number of shareholders | 459,114 |
| Number of shares issued | 4,237,600,000 shares |
| Number of consolidated subsidiaries | 498 (200 in Japan, 298 overseas) |
| Number of affiliates accounted for by the equity method | 202 |
| Stock exchange listings | Tokyo, Osaka, Nagoya, London |

## Financial Results (Consolidated)

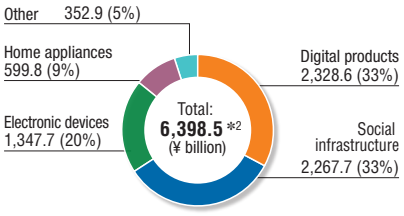
### Net Sales



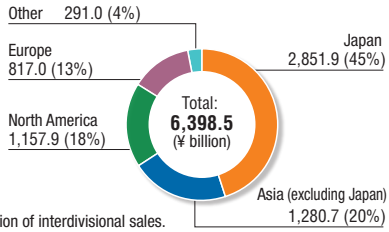

### Operating Income & Net Income



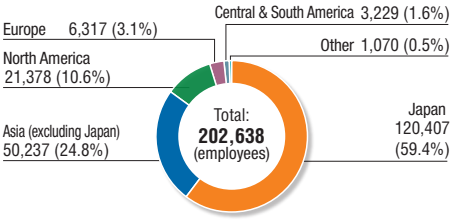

### Sales by Business Segment*1 (FY2010)




### Sales by Region (FY2010)




### Number of Employees by Region (as of March 31, 2011)




*1 Percentage of sales for each segment to total sales before exclusion of interdivisional sales.
*2 Consolidated net sales.

## Main Products and Services

### Digital Products


LCD TV


Blu-ray disc recorder

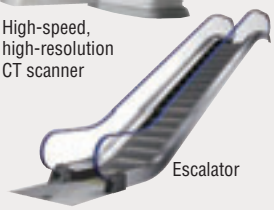

Notebook PC


Tablet PC


Hard disk drive

### Social Infrastructure Systems

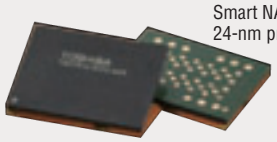

High-speed, high-resolution CT scanner


Escalator


Turbine for thermal power generation


Photovoltaic power generation system

### Electronic Devices


Smart NAND using 24-nm process technology



Power device


Low-temperature polysilicon TFT liquid crystal display

### Home Appliances


Air-conditioner


LED light



Washing machine with dryer


Refrigerator/freezer

Please refer to the Toshiba Annual Report 2011 for detailed business and financial information. This information is also available at the following website: http://www.toshiba.co.jp/about/ir/index.htm

# Editing Policy

Toshiba Group has published the Environmental Report since FY1998 (From 2004 to 2007, environmental information was provided in the CSR Report). This report is published to put together detailed environmental information on Toshiba Group in book form so that it can be provided to all stakeholders of the Group. This year's edition expanded its content to include information on Toshiba's response to the Great East Japan Earthquake, initiatives to mitigate climate change as well as use resources effectively at the production sites and product levels, and other undertakings. All information in this report is disclosed on Toshiba's website. Additional information will also be provided there as it becomes available.

■ Providing detailed environmental information

**Environmental Report 2011 and website for environmental management**


http://www.toshiba.co.jp/env/en/index.htm

eco style website
ecostyle.toshiba.com

■ Providing financial information

**Annual Report 2011 and website for investor relations**


http://www.toshiba.co.jp/about/ir/index.htm

■ Reporting on CSR activities (social and environmental) in general

**CSR Report 2011 and website for CSR activities**



http://www.toshiba.co.jp/csr/en/index.htm

■ Reporting on Toshiba Group's global corporate citizenship activities

**Social Contributions Activities Report and website for corporate citizenship activities**


http://www.toshiba.co.jp/social/en/index.htm

# Contents



● **Organizations covered**

In principle, this report covers Toshiba Group (Toshiba Corporation and its 498 consolidated subsidiaries in Japan and overseas). In cases where the report covers entities other than Toshiba Group, the individual entities are indicated.
Note: "Toshiba" in this report means Toshiba Corporation.

● **Reporting period**

This report focuses on the results of activities in FY2010 (April 1, 2010 to March 31, 2011), but includes some activities continuing from the past and some more recent activities.

● **Publication**

The current issue was published in October 2011 (The publication of the next issue is scheduled for October 2012, and the previous one was published in October 2010).

● **Significant change during the reporting period**

As of October 1, 2010, Toshiba Corporation transferred its mobile phone business to a new company (Fujitsu Toshiba Mobile Communications Limited), with 80.1% of this new company's stocks being allotted to Fujitsu Ltd.

● **Reference guidelines**

•Global Reporting Initiative (GRI)
Sustainability Reporting Guidelines Third Edition (G3)
Note: The comparative table for GRI guidelines is posted on Toshiba's website.
•Ministry of the Environment of Japan
Environmental Reporting Guidelines 2007
Environmental Accounting Guidelines 2005

● **Ensuring universal design in terms of color vision**

We made efforts to ensure the text and charts herein are easy to read for as many readers as possible irrespective of differences in color vision. For details, visit our website for environmental management.

**Disclaimer**

This report includes descriptions of Toshiba's future plans and strategies, as well as prospects of its financial results. These descriptions and prospects are based on matters decided and opinions formed using information that is obtainable at this time.

# CEO Commitment

## In order to become one of the world's foremost eco-companies, we will contribute to realizing a world in which people lead affluent lifestyles in harmony with the Earth through our environmentally conscious processes, products and technologies.

**Norio Sasaki**
**Director**
**President and CEO**
**Toshiba Corporation**

### Support for Recovery from the Great East Japan Earthquake

First of all, please allow me to express my deepest condolences to the families of those who lost their lives as a result of the Great East Japan Earthquake as well as my sympathies to those who continue to suffer from its aftereffects. Ever since the March 11 earthquake, Toshiba Group has been making collective efforts to support recovery from the earthquake and its aftermath.

In particular, as part of our efforts to restore social infrastructure, we established an emergency task force to assist in ensuring the safety of the Fukushima Nuclear Power Plants immediately after the earthquake and have been striving to the utmost to do so. As a company engaged in the development of nuclear power generation systems, we are fully aware of the serious implications of this nuclear accident and place the highest priority on stabilizing the situation. In order to help restore approximately 10 MW of power this summer, we have also made every effort to restore thermal power plants and damaged transmission and distribution systems as well as to resume the operation of those facilities undergoing regular inspection as soon as possible.

We will continue to contribute to Japan's restoration efforts across a wide range of business areas, including "home appliances" such as air conditioners and digital products in addition to social infrastructure.

### Working to Become One of the World's Foremost Eco-companies Based on Integrity

Since my appointment as President and CEO of Toshiba, I have consistently emphasized the need for unshakable integrity. Toshiba Group remains firm in its resolve to meet its responsibilities to society by ensuring legal compliance and minimizing risks throughout all of its business areas. We will strive to the utmost to support the restoration of Japan and to provide solutions to global issues, including strengthening energy security and overcoming environmental problems. Through these efforts, we will contribute to the realization of a sustainable society by continuing to provide our unique products and services using the highly advanced technologies, including energy and environmental systems as well as digital networks.

As a corporate citizen of planet Earth, Toshiba Group aims to become one of the world's foremost eco-companies in order to realize a world in which people lead affluent lifestyles in harmony with the Earth. To that end, Toshiba Group is developing three "Green" initiatives under its "Toshiba eco style" global brand: Greening of Process, Greening of Products, Greening by Technology, and Green Management supporting these three Green initiatives.

### Greening of Process

The Greening of Process refers to environmentally conscious manufacturing. We will work to reduce environmental impact across all manufacturing processes in order to achieve the world's lowest level of environmental impact. Manufacturing activities of a company impact the environment; examples include energy consumption, $CO_2$ emissions and waste. To minimize Toshiba Group's $CO_2$ emissions, we are implementing all available measures such as improving air conditioning efficiency and conserving energy consumed by manufacturing equipment and lighting at our new rechargeable battery factory in Kashiwazaki City, Niigata, Japan, which started production in February 2011, and at the new semiconductor fab of our Yokkaichi Operations, which was completed in July 2011. In addition to supporting earthquake recovery efforts, we have worked diligently to help reduce power consumption by saving energy during the peak period of summer 2011. We also plan to continue our efforts to minimize increases in $CO_2$ emissions by implementing energy-saving measures throughout all Toshiba Group business sites.

## Greening of Products

The Greening of Products refers to environmentally conscious products. We will achieve the highest level of environmental performance for all products that we develop in order to reduce environmental impact throughout product life cycles. While various energy-saving initiatives have been implemented in developed countries, a growing demand for social infrastructure and the wider use of home appliances and digital equipment in emerging countries are likely to cause significant increases in power and resource consumption. Through our efforts to respect the diverse cultures of different countries and to provide products tailored to the needs of individual customers, we will contribute to reducing environmental impact while at the same time promoting safer and more comfortable lifestyles. By 2020, we aim to achieve an annual mitigation of 34.8 million tons of $CO_2$ emissions by promoting the use of energy-saving products, such as TVs and PCs with a "peak-shift" function, LED lighting systems and our eco-chip for zero standby power, in addition to expanding the range of Excellent ECPs, which are products with the highest level of environmental performance.

## Greening by Technology

Through our Greening by Technology initiatives, we will reduce $CO_2$ emissions by using advanced technologies, including our low-carbon power generation systems. We will enhance our initiatives aimed at developing renewable energy sources, including solar, hydro, wind and geothermal power. At the same time, we will also promote the commercialization of high-efficiency thermal power generation technology and carbon capture and storage (CCS) technology, as well as the development of next-generation nuclear reactors that provide greater safety. To contribute to providing a stable energy supply and realizing a low-carbon society, we will propose low-carbon power generation and distribution systems adapted to best serve the needs of different countries around the world. In our smart community initiatives geared toward creating new environmentally conscious communities, we will play a leading role in the development of comprehensive, integrated system solutions for future communities, including power supply, water and sewage, transportation, health, information and security systems.

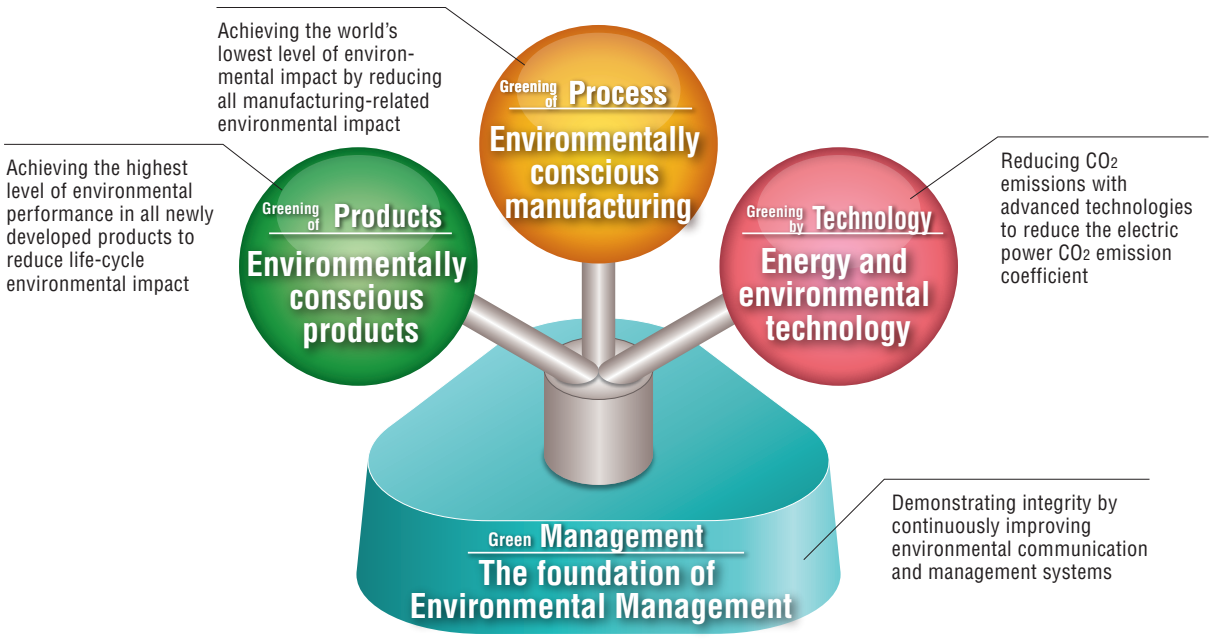
## Green Management

We recognize that biodiversity plays an important role in providing us with healthy ecosystems which contribute to a sustainable society. There is a growing need to adopt initiatives aimed at conserving biodiversity in our corporate activities. At Toshiba Group, we consider the conservation of biodiversity to be a significant environmental management issue alongside the mitigation of climate change. Our biodiversity conservation initiatives include conducting biodiversity assessments at our production sites in order to develop ecosystem networks through local collaboration as well as taking an active part in developing products that contribute to such conservation.

We also promote core activities in our Green Management initiatives, such as environmental communication in which we provide information on the environmental aspects of our manufacturing, products and services; the training of next-generation leaders in environmental activities; and continuous improvements in our environmental management system, all with a view to achieving integrity, which for us means healthy and socially responsible business activities.

## Committed to People, Committed to the Future

The philosophy of serving the public with passion and commitment to innovation, which Toshiba Group has carried down for 136 years since its establishment, is firmly incorporated into our company's DNA. People's values and lifestyles are changing dramatically after the Great East Japan Earthquake. By responding to these changes with innovation, we aim to provide new products and services to customers in Japan and around the world. As a company aiming to play a leading role on the global stage, we will accelerate the development of our overseas business while making contributions to realize a sustainable society by further integrating our business and environmental management. To that end, we will reaffirm the commitment we express in Toshiba Group's slogan, "Committed to People, Committed to the Future," and will stand firm in our resolve to become one of the world's foremost eco-companies.



# Toshiba's Initiatives for Reconstruction and Power Saving

## We are contributing to rebuilding Japan and saving electricity across a wide range of areas, making the most of its technological strengths and diverse business domains.

### Products for reconstruction and power-saving

Toshiba Group has made stabilizing the Fukushima Daiichi Nuclear Power Station, which was hit by the March 11, 2011 Great East Japan Earthquake (for details, see P50) top priority, and will contribute to rebuilding Japan across a wide range of areas, from social infrastructure to household appliances and digital products, making the most of its diverse business domains.

As for products and services that can contribute to rebuilding Japan and saving electricity, we will provide next-generation organic LED (light-emitting diode) lamps, which efficiently emit light from their surfaces and can also be used with alkaline and solar-powered rechargeable batteries; peak-shift TV sets and PCs, which switch over to built-in batteries for power when electricity demand peaks; storage batteries with built-in SCiB™ rechargeable batteries, which have a long lifespan, provide backup power for an extended period of time, and are effective in saving electricity during times of peak power demand; conventional LED lamps; DC electric fans; electricity storage systems for photovoltaic power generation; and cloud computing services which make power consumption visible.

### Peak-shift TVs

When watching TV, users can switch the power source in use from AC to the batteries by pressing the remote control's "peak shift" button. By pressing the "power saving" button, users can automatically adjust screen brightness and picture quality to reduce power consumption.


### Next-generation OLED lighting

We have provided 100 units of OLED (organic light-emitting diode) lamps (newly developed in FY2011), 4,000 AAA alkaline batteries and 100 solar-powered rechargeable batteries. OLED lamps will be effectively used as reading lights and portable lights at evacuation sites and in areas where electric power is in short supply, because they consume very little power and can also be used with alkaline as well as rechargeable batteries.

### Storage batteries with built-in SCiB™ rechargeable batteries

This is an uninterruptible power supply with built-in SCiB™ rechargeable batteries, which are designed for stores and offices and also effective in saving electricity at times of peak power demand. These storage batteries ensure business continuity by providing uninterrupted power in the event of power failures and backup power for stores' POS, office computers, and other systems.

## Reducing electricity use at production sites

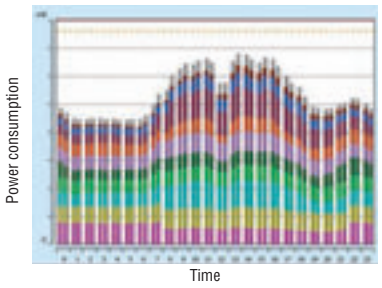
After the earthquake, Toshiba Group immediately implemented every possible power-saving measure at its production sites, including removing some fluorescent lamps, adjusting the time and set temperature of air conditioners, stopping some elevators, shifting production from daytime to nighttime, and instructing employees to adopt the summer business dress code earlier than usual.

For the summer's hours of peak power consumption, Toshiba Group is taking further power-saving measures to reduce power consumption in line with Japanese government policies. Starting in June 2011, it introduced a real-time power consumption monitoring system at its major operation sites to advance the monitoring of power consumption. Furthermore, Toshiba Group will strive to reduce power consumption at times of peak power demand by actively taking measures such as introducing rolling summer holidays, spreading servers across diverse locations, and enhancing in-house power generation systems.

## Making power consumption visible

Toshiba provides cloud computing services to make power consumption visible by collecting real-time data on the power being consumed at numerous plants and office buildings. In mid-June 2011, Toshiba Group started to gradually introduce these services at approximately 50 of its operation sites in eastern Japan.

Change over time in power consumption by facility

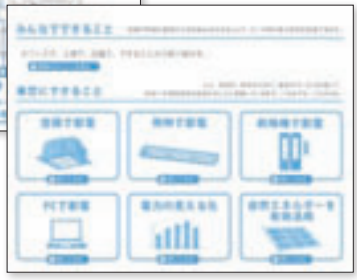



## Introducing tips for power-saving

Toshiba posts articles on its website which suggest ways of cleverly using the power-saving functions of products primarily designed for home use, such as PCs, TV sets, air conditioning systems, refrigerators, washers, dryers, as well as those products and services from Toshiba Group installed and managed by corporate users, such as lighting equipment, air conditioning facilities, and elevators used at production sites, offices, or stores. On the website, it also proposes measures for realizing further power savings and energy conservation.

Examples of power-saving measures introduced on the website include using electricity peak shift functions and power-saving modes for PCs, setting air-conditioning systems to lower temperatures, and promoting more efficient and environmentally conscious LEDs.

Home page for individual customers



Home page for corporate customers

Visit http://ecostyle.toshiba.co.jp/ (Japanese).

### • Notebook PC with an electricity peak shift function

At times of peak power demand, it shuts off its AC power supply and switches over to its built-in batteries, which store power when demand is low, thus contributing to the leveling out of power demand (only available in some notebook PCs in Japan).


### • Air conditioning systems with power-saving functions

While operating in eco-mode, these air conditioning systems send cold air only to the area around users, reducing wasted electricity*1. In cold-air mode, the systems deliver cold air while consuming only 45 watts*2 of electricity, nearly the same level of consumption as that for electric fans.

*1 When using the "automatic comfortable air current mode"
*2 During stable operation in cool-air mode when the outside temperature is 27°C and the system temperature is set to 27°C


### • A base light with an integrated LED module

Base lights with integrated LED modules achieve high efficiency at low cost through realizing optimal heat radiation and high-density LED implementation. Such lights reduce power consumption by as much as 46%*3.

*3 Based on a comparison of FT-42306-RS2 using two FLR40 lamps to LEDT-48007-LD9 with an integrated LED module

# Experts' Opinions on Post-quake Trends

## Effects of the earthquake on human values

The Great East Japan Earthquake has had tremendous effects on values, and it is important to seek different social systems and lifestyles from conventional ones. In order to confirm that Toshiba Group's Environmental Vision 2050—what it regards as the ideal sustainable society—is consistent with changes in people's way of thinking, we asked four experts about the effects of the earthquake and future trends.

### Pursuing manufacturing through natural technology

**Prof. Emile H. Ishida**
**Graduate School of Environmental Studies**
**Tohoku University**

The results of a survey of the human subconscious indicate that the value people seek most is convenience, followed by nature. However, an increasing number of people cite nature as their most important value. Essentially, this trend did not change immediately before or after the earthquake, but it does seem that the disaster is somehow accelerating this change.

What is important in the future is to "backcast" people's lifestyles. As long as we see the environment through forecasting and attempt to balance environmental concerns with affluent lifestyles based on human desires, we will find ourselves in an ecological dilemma—that is, a situation in which we cannot reduce environmental impacts because of growing consumption, even if products are more environmentally aware and consumers develop keen environmental sensibility. In the end, the concept of forecasting tends to force self-control onto people, but we can develop completely different ideas if we envisage ways of realizing affluent lifestyles through backcasting—using environmental concerns rather than human desire as the premise. For example, consider an environmentally conscious way of taking a bath. Forecasting dictates that "one should restrain the urge to bathe every day, doing so every second day instead." By contrast, backcasting suggests "one may bathe everyday in bubbles which do not require water.*"

The results of a survey of the younger generation's attitudes show that an increasing number of them tend to have an aversion to owning things. They instinctively feel that there is something wrong with today's society, and it is increasingly common for them to avoid buying things, use bicycles or walk as much as possible, enjoy nature, and love both engineering and philosophy. They have no strong thirst for money nor for success. Though they differ in enthusiasm, they also understand that there are global environmental issues which must be solved. In terms of changes in the attitudes of young people, similar tendencies can be seen throughout the developed world, while developing countries are characterized by their younger generation's strong desire to become rich. In the future, I believe that it will become important to respond to the demands of this age in which people seek new forms of technology to take responsibility for their lifestyles.

* http://www.rpip.tohoku.ac.jp/seeds/profile/17/lang:jp/ (Japanese)

### Magazines and mail-order sales to "change the world though Japan's ecological technology"

**Ms. Reina Otsuka**
**CEO**
**Ecotwaza Co., Ltd.**

A survey of the attitudes of the younger generation indicates that their desire to possess objects is generally declining, but among those of age to attend university, one can see a trend in which the basic desires for food, clothing, and shelter are reviving. This can probably be attributed to a growing desire for stability due to the earthquake.

In developing countries, on the other hand, young people are still seeking to participate in economic development, and their desire to possess objects appears to be remaining strong. In emerging economies such as Brazil, for example, in recent years the younger generation has shown a growing desire for owning cars and houses.

I believe that the medium-term macroscopic trend is for economies to become globalized while societies and cultures become more decentralized and localized. Even today, an increasing number of people want to live in the countryside, and it is expected that more and more people will prefer country life in the future as aspirations to return to nature grow even stronger. The younger generation appears to enjoy a slightly inconvenient life without omnipresent convenience stores. Even such cases, however, the prerequisite is of course that there be no barrier to online information access. The Internet, which has found its way deep into young people's lives, is now indispensable in their everyday life.

Today, products such as consumer electronics are nearly "black boxes," and users do not even understand how such devices are manufactured. If one creates something by oneself, one can maintain or repair it easily. I am also somewhat uncomfortable living in a world where all products depend on electricity and we cannot live without it. There are many tools around us, such as pencil sharpeners, that could be operated manually without the overhead of using electricity. In general, products today are most valuable when they are purchased; the longer they are used, the lower their value becomes. Isn't this a consequence of the fact that many of them are black boxes? If such boxes should break down, responsibility will be placed on their manufacturer. By contrast, one takes responsibility for and becomes attached to that which one creates and maintains by oneself. Even if defects occur in such personalized products, there will probably be fewer and fewer cases leading to complaints. It could be said that we live in an age in which consumers seek those things which grow in value the more they are used.

## Ecosystems provide a clue for sustainable use of national land

**Prof. Shiro Wakui**
**Faculty of Environmental and Information Studies**
**Tokyo City University**

The environmental capacity of the earth is approaching its limits, and we should now change our way of thinking, which dates back to the Industrial Revolution. From estimates of known underground resource deposits, it is surmised that we will reach the peak somewhere between 2030 and 2050. Biological resources cannot keep up with population growth. In the future, we must shift our way of thinking from "resources are for human use" to "we must ensure the planet's sustainability to enrich the lives of future generations." Going forward, we should seek to add depth to our affluent lifestyles rather than simply seeking affluence. To this end, the way of thinking known as "backcasting" is important. Each and every one of us are confronted with an urgent task—that of creating a lifestyle that future generations will not regret—during our time on this planet. We must aim for lifestyles that enable energy and resources to circulate autonomously within the limits of environmental capacity. This was known before the earthquake, but in the future we may look back on the earthquake as a turning point in history.

In Japan, upon the enactment of the Taiho Code in 701, the government divided its land into 60 provinces along major drainage basins to maintain harmony with nature. During the Warring States and Edo periods, based on those administrative boundaries established in consideration of the environment, Japan was divided into approximately 300 han (feudal domains) bounded by basins, mountains, rivers, and beaches. In other words, until roughly 60 years ago, Japanese society was bound by nature. Many technologies for coexisting with nature were developed, including those for flood control, wooden frameworks, and methods of assembly. Furthermore, as typified by the "Bow Shooting Boy," a mechanical doll which intentionally misses the mark when shooting an arrow, invented by Hisashige Tanaka (one of the founders of Toshiba), in the past Japanese were sensitive in their pursuit of technological enjoyment. The value of a product is the sum of its functionality and quality, but in the future, such sensitivity will also likely be considered an important part of product value. In short, Japan has a major role to play in the building of sustainable societies.

In the past, happiness could be expressed as the equation "happiness = material consumption/material desire," but recently there is a shift toward a new equation, "happiness = degree of satisfaction with respect to time/desire for self-realization." At the same time, in communication demand for dense temporal connections rather than spatial ones is growing. In the future, proposing new lifestyles by identifying these kinds of changes in people's values precisely will be particularly important.

## Proposing policies to build a sustainable society

**Mr. Jiro Adachi**
**Executive Director**
**Japan Center for a Sustainable Environment and Society**

A look at the changes in people's values reveals that among some citizens of developed countries, including Japan, values are no longer focused on financial and material prosperity. Since the Great East Earthquake & Disaster, as perceptions of disaster prevention and safety changed, there have been increasing calls worldwide for reducing dependence on nuclear energy and increasing use of renewable energies. In addition, Japanese are becoming more and more active in saving electricity on a national scale. Toshiba will also be urged to improve the safety of its products. Meanwhile, in the developed countries, citizens are calling for their governments to adopt measures to cope with serious economic and unemployment problems. In Japan, the top priority is to restore the livelihoods of the people in the disaster-stricken areas, and another urgent task is the adoption of measures to cope with unemployment and the flight of companies overseas. Japan can gradually approach a truly well-balanced society by considering those calls for shifts toward values no longer as focused on financial and material prosperity and calls for measures to cope with the serious economic and unemployment problems. Emerging economies, meanwhile, are now in the middle of their economic growth, and therefore the spreading speed of values no longer as focused on financial and material prosperity will be relatively slow.

In recent years, young people have tended not to want to own cars due to changes in their values as well as their financial difficulties. As exemplified by the Internet and computer games, the way they enjoy their lives has changed, and environmental awareness is also spreading among them. When thinking about international cooperation, the younger generation is highly interested in "base of the economic pyramid" (BOP) businesses, and I have the impression that many young people are thinking about how to solve environmental and social problems while pursuing economic activities.

In order to strike a balance between the environment, the economy, and society, we must fully discuss essential issues such as what to do about industry and employment. We must also examine numerous schemes for revitalizing local areas to create more jobs.

A look at intergovernmental negotiations on climate change reveals that many countries are increasingly interested in this global issue, as symbolized by the participation of their leaders in such negotiations. However, while developing countries need to continue development, many of the developed countries are faced with economic and employment problems. In the short term, it will be no easy matter to establish an international framework to avoid the threats posed by climate change. Even in this situation, we must urge governments to build an effective international framework that enables them to solve these problems together on an equal footing.

In summary, the four experts' opinions laid out above suggest that the true nature of the direction or vision of the future society toward which we aim does not seem to change drastically even after the Great East Japan Earthquake. One expert commented, however, that the earthquake may accelerate social changes. Some of the experts further emphasized the importance of using backcasting when coping with such changes.

To ensure that all people can lead affluent lifestyles in harmony with the Earth, Toshiba Group has announced its Environmental Vision 2050. We will take a hard look at how society should be in the future and further enhance our environmental management so as not to lose sight of our direction even as the speed of change accelerates due to the earthquake.

## Highlights

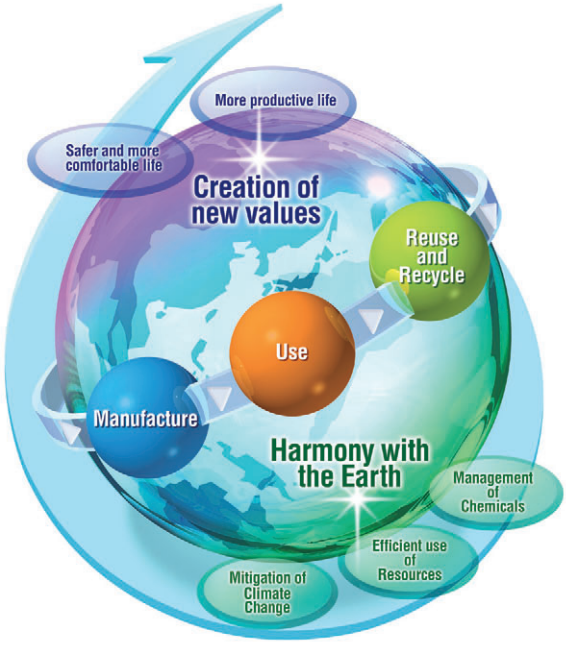
# Toward Environmental Vision 2050

Toshiba Group will contribute to society by creating new value through innovation to ensure that all people can lead affluent lifestyles in harmony with the Earth.

Toshiba Group, aiming to become one of the world's foremost eco companies, continues to ask how mankind should live in the future and what role we should play in society and for the Earth. As solutions for various environmental issues, including climate change, are called for, Toshiba Group has developed Environmental Vision 2050 to ensure that these environmental issues are solved and that all people can lead affluent lifestyles in harmony with the Earth. With the DNA of Toshiba Group, we endeavor to contribute to society with passion and determination and will create new value through revolutionary innovations.

**Environmental Vision 2050**

**Toshiba Group practices environmental management that promotes harmony with the Earth, contributing to the creation of a richer lifestyle for society.**




**To realize Environmental Vision 2050, we are promoting both the creation of new value and harmony with the Earth.**

## Environmental Vision 2050

Toshiba Group has developed Environmental Vision 2050, a corporate vision that envisages affluent lifestyles in harmony with the Earth as an ideal situation of mankind in 2050, and will work to realize this vision.

Throughout the life cycle of products from manufacture and use to recycling and reuse, Toshiba Group will strive to provide safer and more comfortable lifestyles and create enriched value for customers. The Group will also strive for harmony with the Earth by working to mitigate climate change, using resources efficiently, and managing chemicals properly in order to reduce environmental impact.

## Performance indicators for our Vision

Based on the concept of "eco-efficiency," we have set goals to ensure that all people can lead affluent lifestyles in harmony with the Earth. Eco-efficiency can be expressed as a fraction, with the creation of new value as the numerator and environmental impacts as the denominator. The more enriched value created—or the more environmental impact is reduced and progress made toward coexisting with the Earth—the more eco-efficiency improves. We call the degree of improvement in eco-efficiency the "Factor," and increasing the Factor leads to affluent lifestyles in harmony with the Earth.

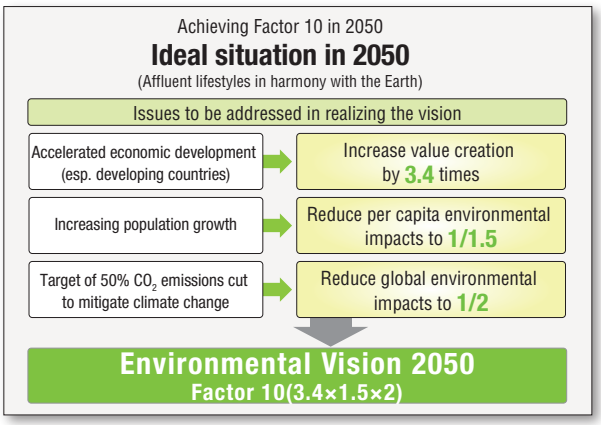
Based on several predictions about the future shapes society may take, we examined how much we need to raise the Factor by 2050.

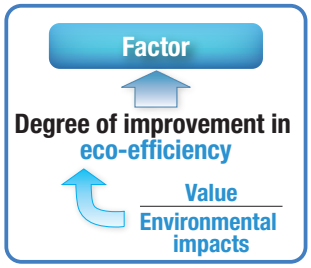
It is assumed that the gross domestic product (GDP) of a country reflects value that its people can enjoy. According to the Organisation for Economic Co-operation and Development (OECD), the world's average GDP per capita is expected to grow 3.4 times by 2050.

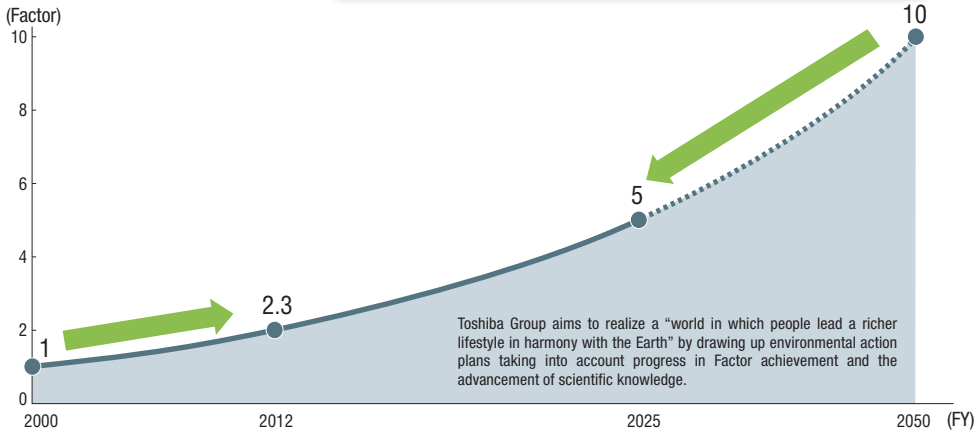
It is also expected that the world population will increase by 1.5 times as compared to 2000 by 2050. In order to reduce environmental impacts as they rise with population growth, it is necessary to increase eco-efficiency by 1.5 times by that year. And at the 15th Conference of the Parties to the U.N. Framework Convention on Climate Change, participants emphasized that it is necessary to reduce greenhouse gas emissions by half by 2050.

If the three points cited above are taken into account, the required degree of improvement in eco-efficiency (Factor) in the world in 2050 is 10 (3.4×1.5×2). As an evaluation indicator, Toshiba Group Environmental Vision 2050 sets the goal of achieving Factor 10 by 2050.

In consideration of the above, long-term goals are established by backcasting from the ideal situation in 2050. Meanwhile, Toshiba Group believes that in 2012, the last year of its Fourth Environmental Action Plan which is currently being implemented, it is necessary to achieve Factor 2.3, a milestone to attain the long-term goals.




Targets for Environmental Vision 2050

- It is necessary to increase the world's eco-efficiency by 10 times as compared to the FY2000 level by FY2050 (Factor 10).
- It is necessary to make improvements to reach at least Factor 2.3 in FY2012, the target year of the Fourth Environmental Action Plan.

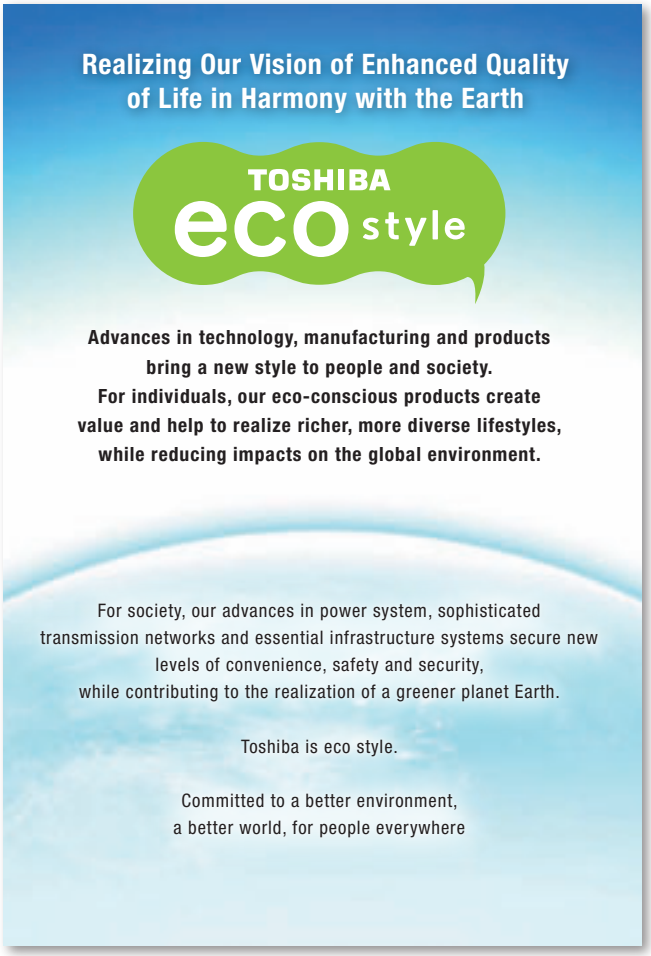
## "Toshiba eco style"

In order to further accelerate its initiatives for environmental management through the three "Green" concepts—"Greening of Process," "Greening of Products," and "Greening by Technology"—as it aims to become one of the world's foremost eco-companies and emphasize its approach to environmental issues in the wide spectrum of society, Toshiba Group has established "Toshiba eco style" as its unified global brand for environmental initiatives. It will work to achieve two eco styles on a global scale: (1) For individuals, our eco-conscious products create value and help to realize richer, more diverse lifestyles while reducing impacts on the global environment, (2) For society, our advances in power systems, sophisticated transmission networks, and essential infrastructure systems secure new levels of convenience, safety, and security, while contributing to the realization of a greener planet Earth.

http://ecostyle.toshiba.com

### "Toshiba eco style," a unified global brand for environmental initiatives

In order to evolve into one of the world's foremost eco-companies, Toshiba Group has been accelerating its environmental management under the global brand "Toshiba eco style." The three circles surrounding the eco style logo, which symbolizes innovative ideas and imagination, represent Greening of Process, Greening of Products, and Greening by Technology.

# Progress on the Fourth Environmental Action Plan*

Toshiba Group aims to increase overall eco-efficiency by 2.3 times in FY2012 through achieving the two eco-efficiency goals for products and business processes.

## Aiming to increase the overall eco-efficiency by 2.3 times in FY2012

Since 1993, Toshiba Group has formulated environmental action plans and managed specific environmental activities and their targets in accordance with these plans. Currently, the Fourth Environmental Action Plan, which covers the period from FY2005 to FY2012, is being implemented. Environmental Vision 2050 requires Toshiba Group to increase the degree of improvement in overall eco-efficiency (the "Factor") to 10 (Factor 10) by FY2050 and to 5 (Factor 5) by FY2025. Taking these requirements into consideration, it will be necessary to increase the Factor to 2.3 (Factor 2.3) by FY2012. Because the Group made progress in increasing value and reducing environmental impact mainly in the area of digital products and devices, we increased product eco-efficiency in FY2010 by 2.44 times (target: 2.2 times) compared to FY2000. We increased business process eco-efficiency by 1.53 times (target: 1.2 times) thanks to a rise in the amount of end-of-life products recycled and sales growth resulting from improvements in the economic situation. Thus, Toshiba Group exceeded its initial targets in both areas. By combining these two indicators we can determine the overall eco-efficiency for FY2010: an increase of 2.26 times (target: 2.0 times) compared to FY2000, thereby achieving our overall eco-efficiency goal as well.

## Planning to achieve the Fourth Environmental Action Plan's final goals for FY2012

The table on the right summarizes the progress made with regard to the various environmental measures taken in accordance with the Fourth Environmental Action Plan in FY2010. During FY2010, Toshiba Group achieved its goals for three of its four product-related items and seven of its nine items related to business processes.

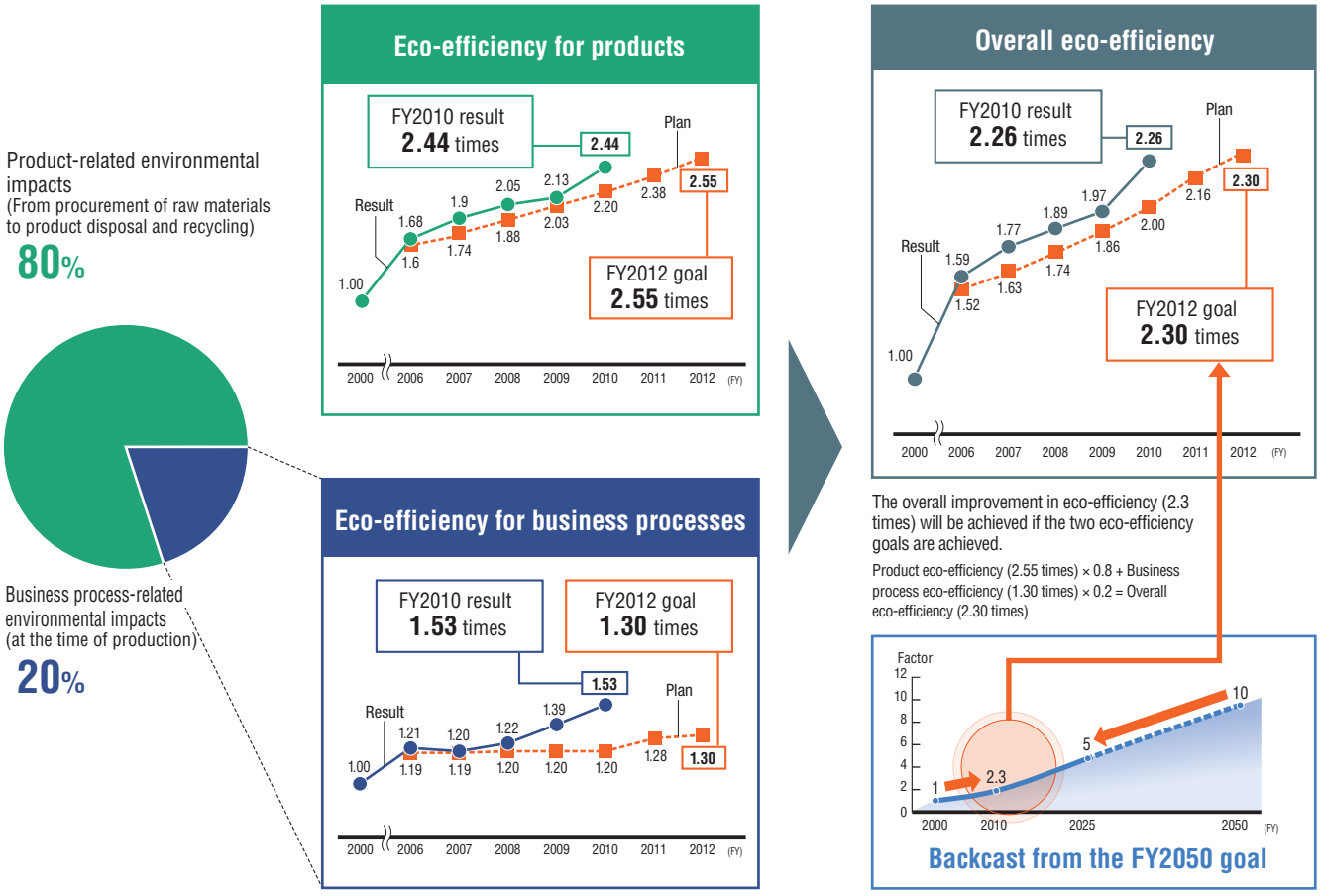
In particular, the Group certified 16 products as "excellent ECPs" (for details, see P33), exceeding initial targets. On the other hand, due to a delayed sales recovery after the collapse of Lehman Brothers chiefly in social infrastructure, it failed to achieve its goals in terms of $CO_2$ emission reduction effects.

In terms of business processes, Toshiba Group achieved its goals to reduce energy-derived $CO_2$ emissions by implementing energy-saving measures at its overseas sites and by introducing renewable energy. On the other hand, it suffered delays in reducing chemical emissions due to delayed capital investments. The Group also saw some of its overseas sites delayed in achieving zero waste emission because recycle-related systems and infrastructure were underdeveloped in the countries where the sites are located.

In FY2011, Toshiba Group aims to achieve its final goals for FY2012 by implementing measures such as increasing sales of excellent ECPs, taking systematic measures focusing on processes that emit large amounts of chemicals and developing overseas waste recyclers.

* The Voluntary Environmental Plan was renamed the Environmental Action Plan in FY2011.

■ **Overall eco-efficiency**



| Degree of improvement for overall eco-efficiency | FY2010 | | | FY2011 | FY2012 |
|---|---|---|---|---|---|
| | Goal | Result | Evaluation | Goal | Goal |
| | 2.0 | 2.26 | +0.26 (Achieved) | 2.16 | 2.3 |

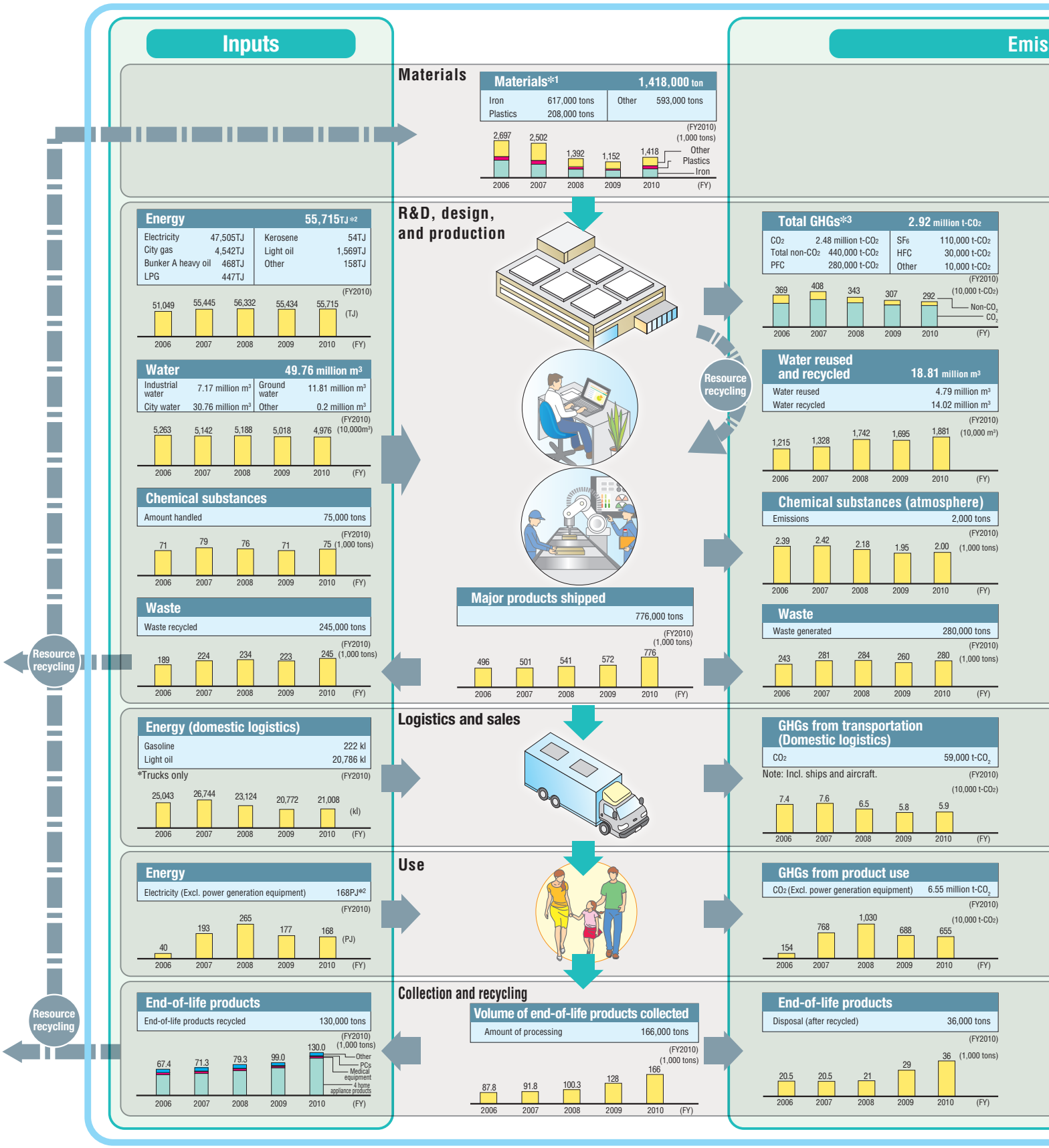
| Improvement of eco-efficiency for products | | Indicator | FY2010 | | | FY2011 | FY2012 |
|---|---|---|---|---|---|---|---|
| | | | Goal | Result | Evaluation | Goal | Goal |
| Creation of environmentally conscious products (ECPs) | Creation of ECPs | Factor for products | 2.2 | 2.44 | +0.24 (Achieved) | 2.38 | 2.55 |
| | | Percentage of ECPs to total sales | 60% | 70% | +10% (Achieved) | 70% | 80% |
| | | | The goal was achieved because the percentage of ECPs in the area of social infrastructure in proportion to total sales increased. | | | | |
| | | Number of Excellent ECPs created | 15 products | 16 products | +1 (Achieved) | 20 products | 25 products |
| | | | Toshiba Group achieved the goal by expanding its product lineups with best-in-class environmental performance, such as PCs and air conditioning systems. | | | | |
| | Mitigation of climate change through products | $CO_2$ emission reductions through eco products | 6.3 million tons | 4.0 million tons | –2.3 million tons | 6.8 million tons | 7.3 million tons |
| | | | The goal was not achieved because of decreases in sales of eco products due to rapid changes in the world economy after 2008. Still, Toshiba Group was able to exceed its initial plan in terms of the range of improvement from the previous year by promoting the development of products with best-in-class environmental performance. | | | | |
| | Abolition of use of all specified chemicals | 15 specified chemicals contained in products[*1] (all use has been discontinued) | Abolition of use of all these substances | Abolition of use of all these substances | (Achieved) | Abolition of use of all these substances | Abolition of use of all these substances |
| | | | Total discontinuation of the use of specified chemicals was achieved for all products. | | | | |

| Innovation in business processes | | Indicator | FY2010 | | | FY2011 | FY2012 |
|---|---|---|---|---|---|---|---|
| | | | Goal | Result | Evaluation | Goal | Goal |
| | | Factor for the entire business processes | 1.20 | 1.53 | +0.33 (Achieved) | 1.28 | 1.30 |
| Mitigation of climate change | Reduction in energy-derived $CO_2$ emissions[*2] | Total emissions per unit production[*3] | 45% reduction | 48% reduction | +3% (Achieved) | 44% reduction | 47% reduction |
| | | Domestic production sites | 45% reduction | 52% reduction | +7% (Achieved) | 44% reduction | 47% reduction |
| | | | The goal was achieved as a result of the implementation of energy-saving measures at overseas sites and the proactive introduction of renewable energy. | | | | |
| | Reduction in greenhouse gas emissions (other than $CO_2$) | Total emissions | 36% reduction | 69% reduction | +33% (Achieved) | 37% reduction | 38% reduction |
| | | | Substantial reductions in total emissions were achieved through the collection of $SF_6$ gas, promotion of recycling and systematic installation of greenhouse gas removal equipment. | | | | |
| | Reduction in $CO_2$ emissions resulting from product logistics in Japan | Total emissions per unit production | 40% reduction | 47% reduction | +7% (Achieved) | 42% reduction | 44% reduction |
| | | | Though the amount of product transported increased, the goal was achieved by proactively using ships and railways. | | | | |
| Chemical Management | Reduction in the amount of chemicals discharged into the atmosphere and hydrosphere | Total emissions | 50% reduction | 29% reduction | –21% (Not achieved) | 52% reduction | 54% reduction |
| | | | The goal was not achieved for reasons such as delays in facility investments. Progress is made in taking planned measures for processes that emitted large amounts of chemicals in particular. | | | | |
| Efficient use of resources | Reduction in the total volume of waste generated | Total volume of waste generated per unit production | 20% reduction | 32% reduction | +12% (Achieved) | 22% reduction | 24% reduction |
| | | | The total volume was reduced mainly due to reductions in the amount of materials used as a result of improved manufacturing and treatment processes. | | | | |
| | Reduction in final waste disposal volumes | Percentage of final waste disposal (sites that achieved zero waste emission[*4]) | 100% | 83% | –17% (Not achieved) | 100% | 100% |
| | | | Overseas sites with underdeveloped recycling infrastructures caused delays in progress. The overall percentage of waste for which Toshiba Group handled final disposal was 2.8%, a reduction of 2.2% from the previous year. The Group is striving to improve the recycling percentage by raising employee awareness at its overseas sites. | | | | |
| | Product reuse and recycling | Rate of increase in the volume of end-of-life products recycled[*5] | 160% increase | 283% increase | +123% (Achieved) | 170% increase | 180% increase |
| | | | The goal was achieved because Japan's eco-point system, which was extended until the end of March 2011, stimulated replacement demand and more products were collected in Europe and North America for reuse and recycling. | | | | |
| | Reduction in the volume of water received | Volume of water received per unit production | 9% reduction | 29% reduction | +20% (Achieved) | 9.5% reduction | 10% reduction |
| | | | Progress was made in reducing the volume of water received mainly by reusing water through the introduction of waste water treatment and collection systems into operation sites that consumed much water. | | | | |

1 Fifteen specified chemical substances: see P41.
2 In this table, the $CO_2$ emission coefficient for electricity in Japan is 3.50 t- $CO_2$/10,000 kWh. Overseas electricity is based on GHG Protocol.
3 FY1990 baseline.
4 Toshiba Group defines "zero emission" as reducing the portion of waste materials resulting from business operations that is disposed of to landfills after they undergo various types of treatment to less than 0.5% for manufacturing sites and to less than 0.1% for non-manufacturing sites (excluding sites subject to legal restrictions, administrative guidance, and other factors).
5 FY2001 baseline, when the Household Appliance Recycling Law was enforced.
FY2000 baseline, unless otherwise specified. Applicable to production and non-production sites in Japan and abroad. As an indicator that enables appropriate assessment of reduction in greenhouse gas emissions, volume-based real outputs are used for basic-unit goals. Real output = [Nominal domestic output] / [Ratio of the domestic corporate goods price index (CGPI) for each year (CGPI for 1990 is 1), based on CGPI (electric equipment) published by the Bank of Japan] + [Nominal overseas output]

# Overview of Environmental Impacts

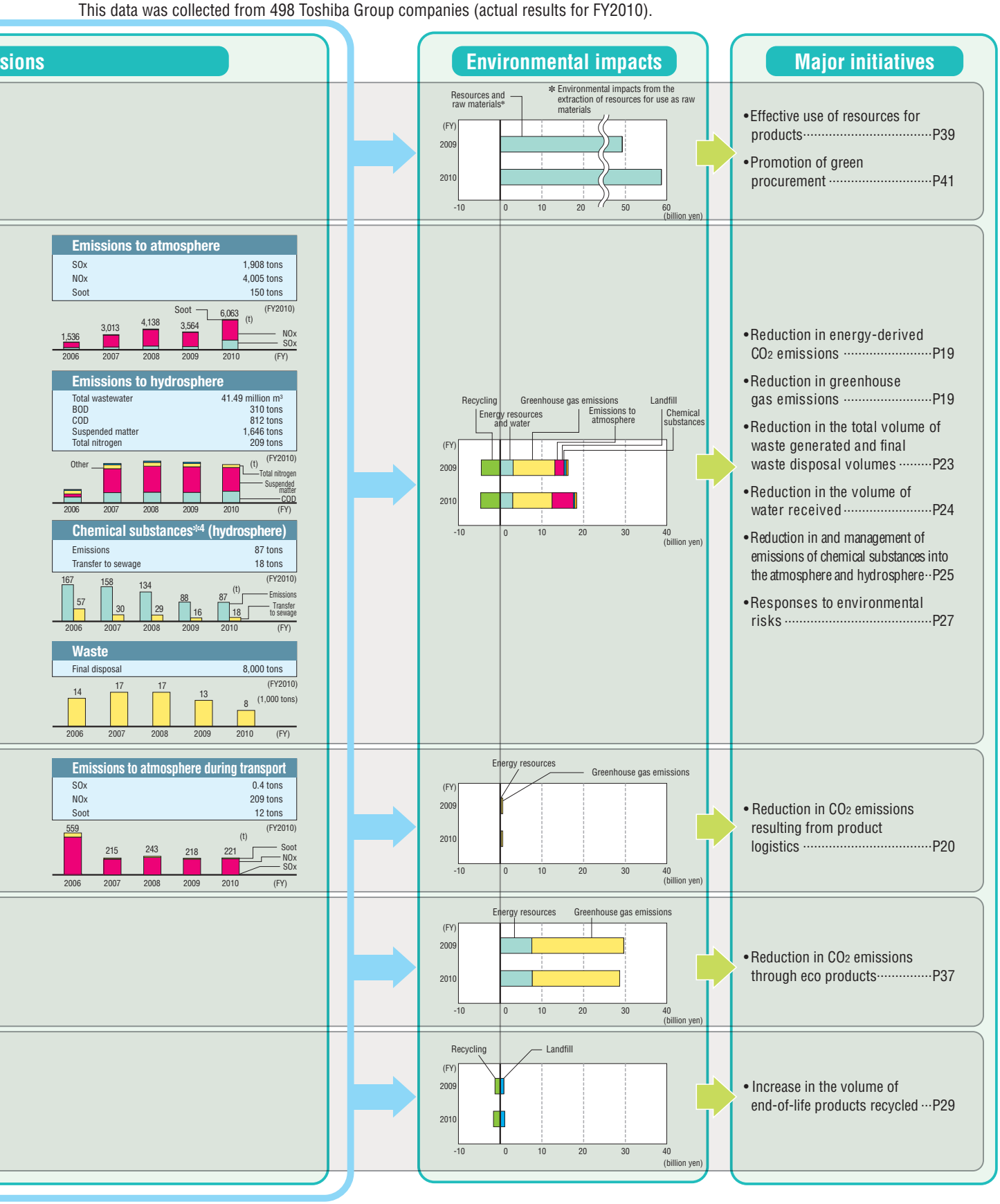
Toshiba Group handles a wide range of products and services from household appliances and information/communications equipment to semiconductors, electronic components and power generation facilities. The Group considers it important to strive to grasp the overall impact of these business activities on the environment and work to reduce these impacts.




*1 Material inputs are calculated based on the Estimation Method for Material Inputs Using Input-Output Table (EMIOT), a method independently developed by Toshiba Group. EMIOT uses ratios of resources used per unit production, which are prepared based on the Input-Output Table, to calculate total material inputs. One distinctive feature of the method is that input-output analysis is applied only to the flow of resources from upstream to downstream. Another is that the volume of such resources by industrial sector are stored in a database. Using this method, it is possible to calculate weights of input resources by resource type from the data on procurement (monetary value) by resource category, which are gathered by materials procurement divisions. Therefore, data can be gathered not only on direct materials, but also indirect materials. Previously, it was difficult to clarify the amounts of resources in parts made of composite materials or the amounts of resources associated with services. EMIOT has enabled clarification of the amounts of resource inputs by resource type for such materials.

As shown in the material flow chart below, Toshiba Group strives to grasp and analyze all environmental impacts throughout the life cycle of products and services, from the procurement of materials, production and logistics to use by customers, collection and recycling. In FY2010, the Group used the Life-cycle Impact assessment Method based on Endpoint modeling (LIME) to assess the overall impact of resource and energy inputs and emissions of greenhouse gases, chemicals and other substances on the environment. Examined by life-cycle stage, the impacts at the level of resources and raw materials were largest, followed by those of use by consumers and production, respectively. A comparison with the previous year indicates that in FY2010, as production expanded, the impacts of materials procured and production rose, but those of use fell due to the introduction of energy-saving products and other factors. As described above, Toshiba Group considers it important to work effectively to reduce overall environmental impact based on quantitative analyses of environmental impacts at each stage of the life cycle of products and services.

This data was collected from 498 Toshiba Group companies (actual results for FY2010).




*2 The joule is a unit of energy measuring mechanical work, heat, and electricity. One joule equals about 0.239 calories. 1 TJ = $10^{12}$ J; 1 PJ = $10^{15}$ J
*3 In this table, the $CO_2$ emission coefficient for electricity in Japan is 3.50 t-$CO_2$/10,000 kWh.
*4 The volume of hydrogen fluoride and its water-soluble salt emitted into hydrosphere in FY2009 was zero because hydrogen fluoride used became non-water-soluble salt through post-use treatment.

# Biodiversity

In order to prevent biodiversity loss on a global scale, Toshiba Group will establish a system to promote its initiatives and visualize the effects of its business activities on biodiversity.

## Toshiba Group's policy on biodiversity

The business activities of Toshiba Group benefit from ecosystem services supported by diverse forms of life and at the same time affect such services. For example, while they receive supply services such as wood resources and water, they affect ecosystems when mining minerals and extracting fuel resources. The final treatment of industrial waste discharged by production sites into the atmosphere and hydrosphere depends on ecosystems' regulating of services such as degradation and purification. For this reason, conserving biodiversity, which provides the foundation for ecosystem services, is an important issue for environmental management.

In accordance with the Biodiversity Guidelines formulated in September 2009, Toshiba Group is striving to reduce environmental impact caused by the construction of production sites, the procurement of resources in business activities and the discharge of industrial waste, etc. It is also pushing forward with products/services aimed at contributing to conservation of biodiversity. Furthermore, the Group will contribute to the conservation of biodiversity by working with local governments and NPOs to carry out social contribution programs such as the 1.5 Million Tree-Planting Project.

http://www.toshiba.co.jp/env/en/management/biodiversity.htm

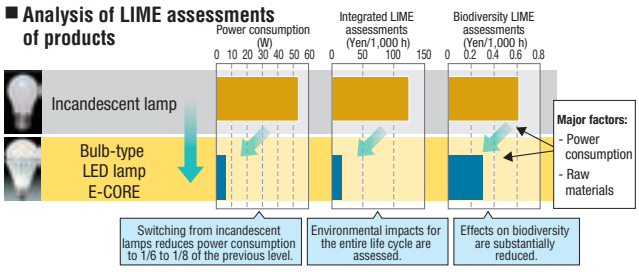
### ■ Four pillars of initiatives to conserve biodiversity

| Assessment of products | Initiatives at production sites | Initiatives for the supply chain | Contribution to society |
|---|---|---|---|
| - Quantitative assessments using LIME<br>- Creation of products and services that contribute to conserving biodiversity | - Establishing ecosystem networks around production sites with community<br>- Wastewater management using WET (Whole Effluent Toxicity) | - Establishing systems to procure from suppliers working to conserve biodiversity | - Toshiba Group 1.5 Million Tree-Planting Project<br>- Cooperation with local governments and NPOs |

## Assessment of products' effects on biodiversity

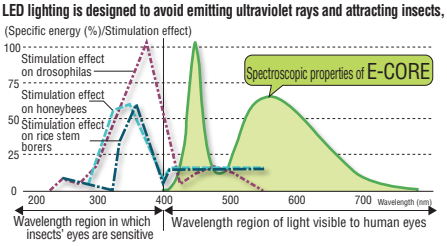
Toshiba Group assesses its products' effects on biodiversity using the Japanese version of the Life-cycle Impact assessment Method based on Endpoint modeling (LIME), which allows for comprehensive assessments from four perspectives: (1) human health, (2) biodiversity, (3) social assets and (4) primary production (for details, see P44). It is also developing products that contribute to conserving biodiversity.

### ■ Analysis of LIME assessments of products




### ■ Spectroscopic properties of E-CORE, our LED lamp model designed to reduce UV radiation

**LED lighting is designed to avoid emitting ultraviolet rays and attracting insects, thus reducing disturbance to ecosystems.**



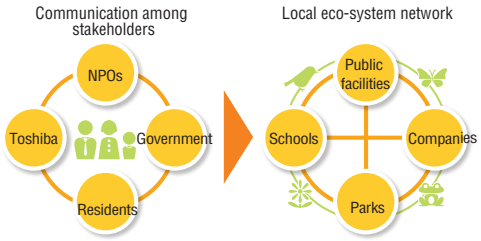

## Initiatives at production sites

- **Establishing ecosystem networks centered on production sites through regional cooperation**

In order to conserve biodiversity at its production sites, Toshiba Group aims to establish ecosystem networks centered on production sites through regional cooperation.

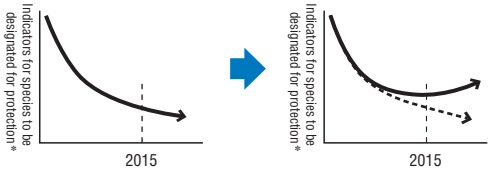
Toshiba Group has confirmed that a wide range of animals and plants, including rare local species, live at its production sites as a result of afforestation, development of biotopes (living places for specific pairings of plants and animals), and other past efforts. However, these ecosystems are not always complete unto themselves within the sites. In particular, to protect animals such as the birds and insects that fly over these sites, it is important to establish networks with external organizations. Therefore, Toshiba Group aims to build regional ecosystem networks in cooperation with residents and NPOs in the municipalities where its production sites are located.

### ■ Local ecosystem networks created in collaboration with stakeholders



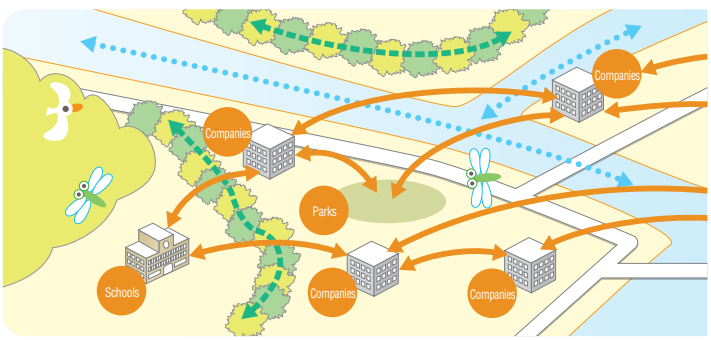

Toshiba Group aims to minimize the adverse effects of its business activities on biodiversity and shift its biodiversity policy toward initiatives for improvement to realize an ideal state of environmental management in 2015. This means that by 2015, the Group intends to prevent the number of species designated for protection (as agreed upon with local stakeholders) from decreasing and to increase the size of the populations of such species from 2015. As the first step, the Group will select the species to be designated for protection at each of its production sites.

### ■ Minimizing adverse effects and shifting toward improvement (conceptual diagram)




Examples: the number of dandelion roots/common kingfishers observed

### ■ Toshiba's ideal regional ecosystem network (conceptual diagram)

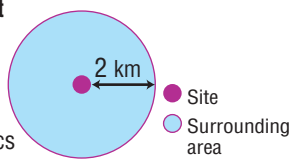


In collaboration with outside experts, Toshiba Group has conducted quick assessments of biodiversity potential in areas surrounding our production sites. These assessments were made to evaluate the environmental potential of wooded areas and river systems located within a 2-km radius of each site in order to examine how our production sites can contribute to the development of local ecosystem networks through land use.

In FY2010, we conducted assessments at 14 sites in Japan and one site in the Philippines. We identified each site's characteristics and made quantitative assessments of how we could contribute to establishing an ecosystem network in the surrounding areas (the biodiversity potential). In the future, we will choose characteristic sites based on the results of these assessments and select the species to be protected, including indigenous or rare species in surrounding areas. We aim to create ecosystem networks in the future in collaboration with local stakeholders.

### ■ Biodiversity potential assessment

- Assessing green zones and water systems located within a two kilometer radius from each site
- Identifying each site's characteristics and quantitatively assessing their biodiversity potential




### ■ Results of quick biodiversity potential assessments at 15 sites

| Type | Site name | Location | Assessment | |
|---|---|---|---|---|
| | | | Green zones | Water systems |
| Industrial zone | Toshiba Ome Complex | Tokyo, Japan | 4 | 4 |
| | Toshiba Fukaya Complex | Saitama Prefecture, Japan | 2 | 1 |
| | Toshiba Keihin Product Operations | Kanagawa Prefecture, Japan | 0 | 3 |
| | Toshiba Yokohama Complex | Kanagawa Prefecture, Japan | 3 | 0 |
| | Toshiba Carrier Fuji Plant | Shizuoka Prefecture, Japan | 1 | 3 |
| | Toshiba Elevator and Building Systems Himeji Plant | Hyogo Prefecture, Japan | 3 | 4 |
| | Toshiba Information Equipment (Philippines) | Republic of the Philippines | 2 | 4 |
| Dense residential area | Toshiba Fuchu Complex | Tokyo, Japan | 3 | 4 |
| | Toshiba Solutions Fuchu Engineering Center | Tokyo, Japan | 3 | 4 |
| | Toshiba Komukai Operations | Kanagawa Prefecture, Japan | 0 | 2 |
| Agricultural land | Toshiba Mobile Display Ishikawa Works | Ishikawa Prefecture, Japan | 4 | 3 |
| | Toshiba Medical Systems | Tochigi Prefecture, Japan | 3 | 3 |
| | Toshiba TEC Shizuoka Business Center (Ohito) | Shizuoka Prefecture, Japan | 4 | 4 |
| Forest | Toshiba Yokkaichi Operations | Mie Prefecture, Japan | 3 | 6 |
| Central urban district | Toshiba Head Office Building | Tokyo, Japan | 3 | 5 |

✻ Shaded sites scored three or more points out of a possible four points for green zones and four or more points out of a possible seven points for water systems.

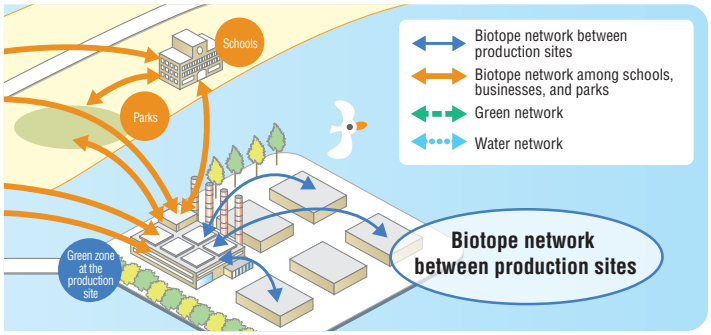
### ■ Candidates species for protection at typical production sites

Toshiba Yokohama Complex

Rare species such as common kingfishers which live in lagoons

Toshiba Fuchu Complex

Dandelions growing wild at the site




### ● Wastewater management using the WET method

Toshiba Group uses the Whole Effluent Toxicity (WET) method, which employs biological indicators, on a trial basis as a new way of investigating the impact of wastewater from its production sites on the environment. This method, which confirms the impact of chemical substances in wastewater on the environment as the magnitude of the overall impact on living organisms, has already been introduced in Europe and North America. With the cooperation of the National Institute for Environmental Studies, investigators at the Yokohama Complex used four organisms of species—luminescent bacteria, algae, crustaceans (water fleas) and fish (zebra fish)—to conduct short-term chronic toxicity tests referring to U.S. guidelines.

In FY2010, Toshiba Group carried out these tests at five production sites, including the Toshiba Yokohama Complex, which were chosen from among the various industries in which it operates. No substantial impact of wastewater on the ecosystem was observed at any site. In the future, the Group plans to continue periodically investigating the status of wastewater management.

Water flea (left) and zebra fish (right) used to assess wastewater (photos courtesy of the National Institute for Environmental Studies)

Sampling of wastewater

## Initiatives for the supply chain

One important element of initiatives for conserving biodiversity is to procure raw materials in a way that accounts for the needs of the environment. Toshiba Group aims to establish a system of procurement which employs suppliers who are keen on conserving biodiversity. In the future, in cooperation with its suppliers, the Group will strive to protect biodiversity throughout the supply chain.

## Contributions to society

Toshiba Group is currently implementing the 1.5 Million Tree-Planting Project. In addition to planting trees, the Group works with local governments and NPOs to prune and thin trees for proper forest management. Through these activities, it contributes to the creation of ecosystems well-suited for the growth of diverse biological species. Furthermore, the Group provides human resource development services for those who love nature, such as tree-planting events for employees, nature observation programs and training for nature observation instructors.

# Greening of Process
# Environmentally Conscious Manufacturing

## We are pursuing the world's lowest level of environmental impacts in manufacturing.

### Summary of activities in FY2010



## Pursuing the world's lowest level of environmental impacts

Toshiba Group is striving to reduce environmental impacts by making production processes more efficient from three perspectives: mitigation of climate change, management of chemical substances, and effective use of resources. It is working to streamline procurement of materials and conserve energy consumption at all of its plants in Japan and overseas, thereby reducing unnecessary greenhouse gas emissions and waste. There are concerns about the effects of the March 2011 Great East Japan Earthquake on future greenhouse gas emissions and the volume of waste generated, but the Group will pursue the achievement of the world's lowest level of environmental impacts by further raising employees' environmental awareness and making all-out efforts to implement every possible measure.

Especially in terms of mitigation of climate change, Toshiba Group will contribute to achieving Japan's goal of "reducing total greenhouse gas (GHG) emissions by 25% compared to 1990 levels by 2020" by working to reduce such emissions mainly at its semiconductor plants, which account for nearly half of the Group's total GHG emissions. In order to ensure effective use of resources, Toshiba Group aims to reduce the total volume of waste generated as well as final waste disposal volumes and will continue to apply innovative schemes to achieve this goal going forward. It will also proactively promote high-quality recycling and strive to use valuable water resources effectively. As for the management of chemicals, the Group will make efforts to discontinue the use of substances targeted for reduction mainly through the introduction of alternative substances and improvements to processes.

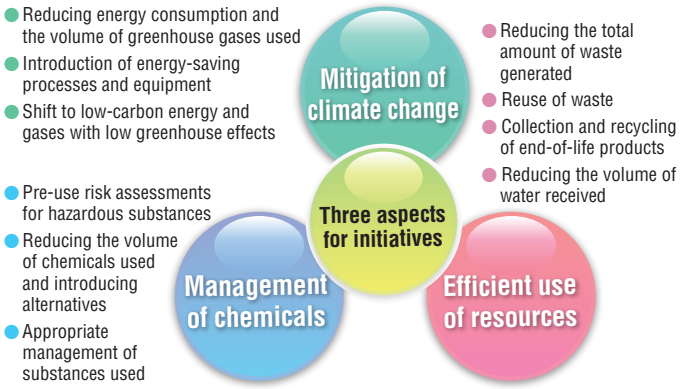
## Reducing greenhouse gas emissions

### ● Toshiba Group's initiatives

In FY2000, Toshiba Group reduced GHG emissions to nearly half of 1990 levels by collecting and reusing $SF_6$ (sulfur hexafluoride), which is used to insulate heavy electric machinery, as well as actively installing equipment to remove PFCs (perfluorocarbons), which are used in semiconductor production. Later, however, energy-derived $CO_2$ emissions increased due to expansion of the semiconductor business, peaking in FY2007 when such production reached its highest level.

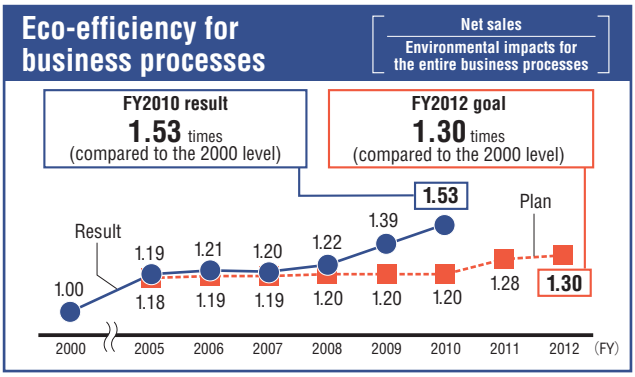
Since FY2008, GHG emissions have been reduced substantially mainly due to changes in the business environment and the reorganization of production sites. However, emissions are expected to increase again in the future as production recovers.
Toshiba Group will strive to minimize increases in GHG emissions by working to implement energy-saving measures and improve production efficiency. By doing so, it is pursuing the world's lowest level of environmental impacts by aiming to realize the lowest level of $CO_2$ emissions per unit sales across all business domains.
Due to the effects of the Great East Japan Earthquake, however, the $CO_2$ emission coefficient for electricity is expected to deteriorate in the future, and indications are that this will greatly affect Toshiba Group, where electricity-derived $CO_2$ emissions account for a majority of total GHG emissions. Therefore, the Group will attempt to minimize growth in electricity-derived $CO_2$ emissions by verifying and evaluating energy-saving measures aimed at reducing electricity consumption as much as possible during the summer and applying such measures to all of its operation sites. In addition, it will closely examine its medium- and long-term GHG emission reduction plans while carefully watching trends related to the effects of the earthquake, the government's energy policy and other developments.

## ■ Initiatives to reduce environmental impacts




# Increasing the eco-efficiency for business processes by 1.3 times in FY2012

Toshiba Group aims to increase the eco-efficiency for business processes, an indicator to assess the impacts of business operations on the environment in a comprehensive manner, by 1.3 times compared to the FY2000 level by FY2012. In order to achieve this goal, the Group set eight specific targets (for details, see P12) as part of its Fourth Environmental Action Plan and is working to reduce environmental impacts. In FY2010, it increased the eco-efficiency for business processes by 1.53 times, far exceeding the goal of 1.20 times. This can be attributed to increases in the amount of end-of-life products recycled due to growth in replacement demand backed by the eco-point system. In addition, decreased GHG emissions due to energy-saving efforts and growth in sales also contributed to the achievement of these eco-efficiency goals.



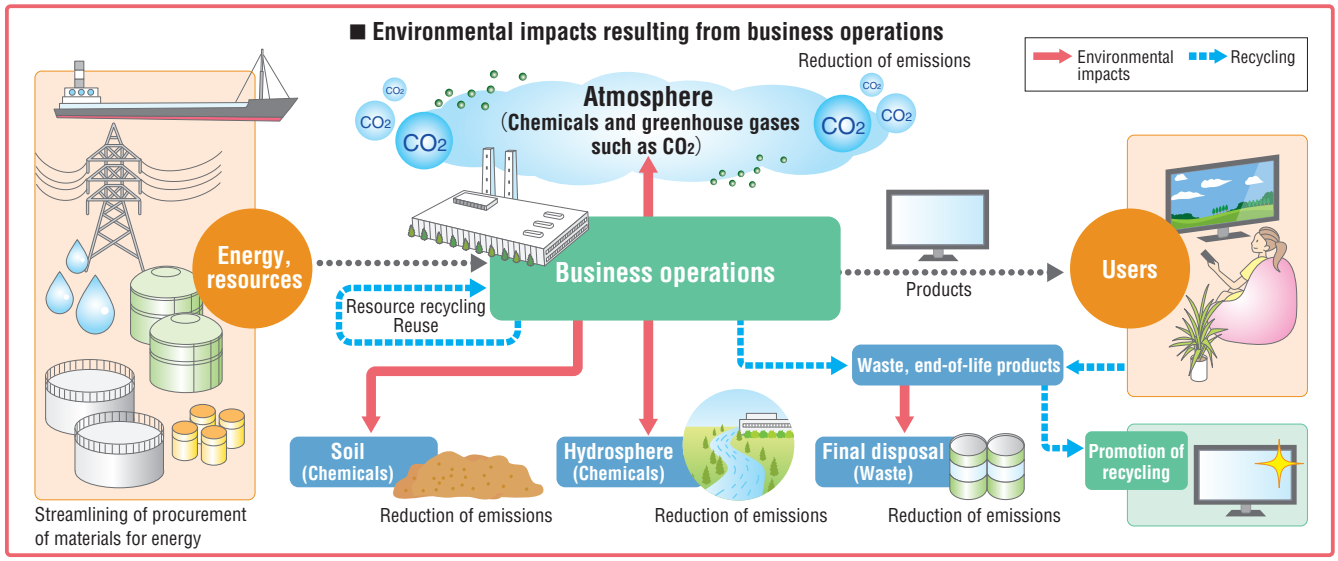

**Degree of improvement in eco-efficiency for business processes** = **Eco-efficiency for business processes in the year assessed** / **Eco-efficiency for business processes in the base year (FY2000)**

Eco-efficiency for business processes = Net sales / Environmental impacts for the entire business processes

**Environmental impacts**
Greenhouse gases, chemicals, waste
→ Impacts → LIME* → Conversion into monetary value

✻ **LIME** One of the leading environmental assessment methods in Japan, LIME (Life-cycle Impact assessment Method based on Endpoint modeling) was developed by the National Institute of Advanced Industrial Science and Technology, an independent administrative institution (for details, see P44).

## ■ Environmental impacts resulting from business operations



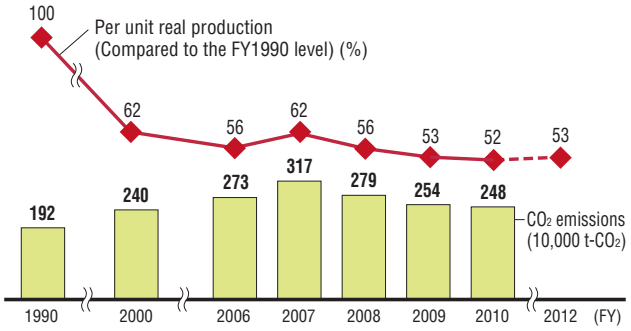
# Mitigation of Climate Change

In order to contribute to the mitigation of climate change, Toshiba Group strives to reduce energy-derived $CO_2$ and greenhouse gas (GHG) emissions, curb $CO_2$ emissions resulting from product transport and engage in initiatives such as the utilization of renewable energy.

## Reducing energy-derived $CO_2$ emissions

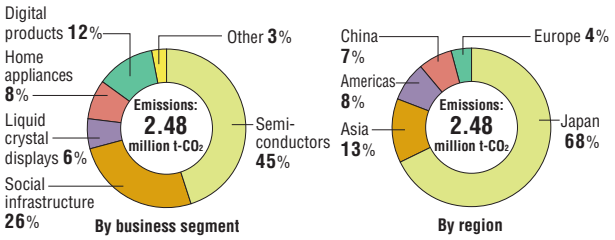
Energy-derived $CO_2$ emissions for Toshiba Group are increasing as its business expands. In the future, the Group plans to build new plants mainly in semiconductor and new rechargeable battery operations in order to meet a lively demand in the market, and energy-derived $CO_2$ emissions are expected to grow in the immediate future. In order to reduce total energy-derived $CO_2$ emissions as much as possible and improve the overall $CO_2$ emissions per unit production, Toshiba Group is introducing energy-saving processes and equipment with the aim of reducing energy-derived $CO_2$ emissions by 45% compared to the 1990 level by FY2010 and by 47% compared to the 1990 level by FY2012. As a result, in FY2010, the Group reduced energy-derived $CO_2$ emissions by 48%, achieving the goals. We will continue to actively promote capital investments such as using high-efficiency chillers and air-conditioning systems as well as introducing high-efficiency lighting system. In FY2011, $CO_2$ emissions are expected to increase as a result of the Great East Japan Earthquake; however, Toshiba Group will actively incorporate energy-saving measures into its activities.

### ■ Energy-derived $CO_2$ emissions




*The $CO_2$ emission coefficient for electricity on the user is used to calculate energy-derived $CO_2$ emissions (3.50 t-$CO_2$/10,000 kWh in FY2010). Overseas electricity is based on GHG Protocol.

### ■ Breakdown of energy-derived $CO_2$ emissions in FY2010




**Example: 1** **Reduction in $CO_2$ emissions by shifting energy use**

**CET Toshiba (Changzhou) Transformer Co., Ltd.**

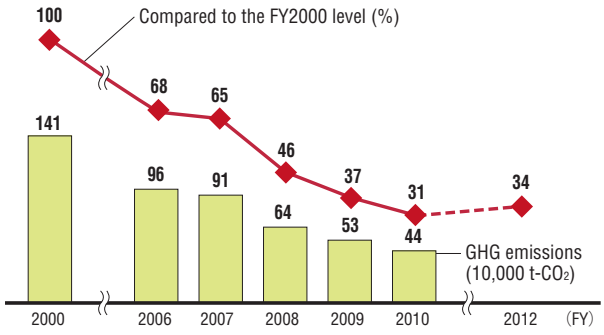
Changzhou Toshiba Transformer replaced coal-burning boilers with natural gas boilers in partnership with the Chinese city of Changzhou to improve air quality and promote a shift in industrial structure. By doing so, the company reduced annual $CO_2$ emissions in 2010 by 7,114 tons (down approximately 65% compared to the previous year).

## Reducing emissions of GHGs other than energy-derived $CO_2$

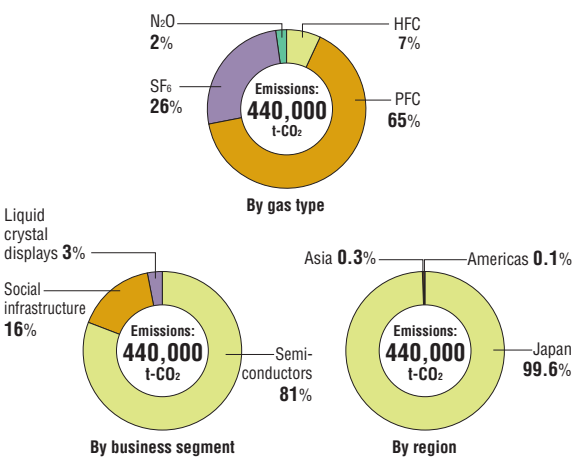
Toshiba Group aims to reduce the emissions of six types of GHGs covered by the Kyoto Protocol* by 36% by FY2010 and by 38% by FY2012, to 62% compared to the 2000 level. PFCs, which are used to produce semiconductors, and SF6, which is used to insulate heavy electric machinery, account for 90% of the Group's total emissions of GHGs other than energy-derived $CO_2$ if they are combined. At its semiconductor plants, Toshiba Group is striving to shift to alternative gases with a smaller climate change potential and install GHG removal equipment in existing lines in a systematic way. In its heavy electric machinery division, the Group is making efforts to increase the collection and recycling rate for GHGs other than energy-derived $CO_2$. As a result, in FY2010, Toshiba Group reduced emissions of GHGs other than energy-derived $CO_2$ by 90,000 tons compared to the previous year's level and by 69% compared to the 2000 level, far exceeding the goal for the fiscal year. Future plans call for business expansion in the semiconductor and heavy electric machinery divisions, but in order to ensure further reduction in GHGs other than energy-derived $CO_2$, the Group will actively take measures such as installing GHG removal equipment on a continuous basis and increasing GHG removal efficiency.

*Carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ($SF_6$).

### ■ Emissions of GHGs other than energy-derived $CO_2$



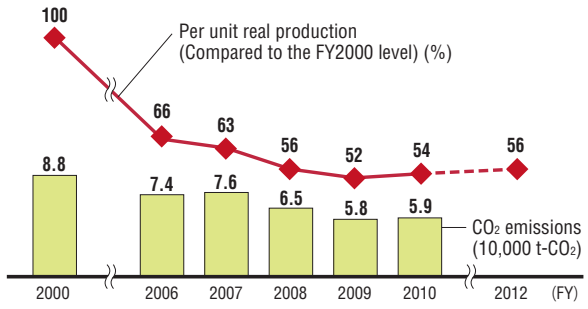

### ■ Breakdown of emissions of GHGs other than energy-derived $CO_2$ in FY2010



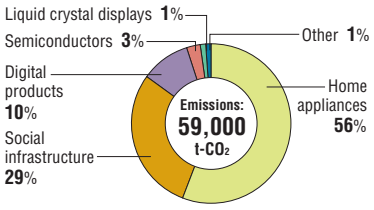
## Reducing $CO_2$ emissions associated with product logistics

Each company of Toshiba Group is working to save energy during product logistics in collaboration with Toshiba Logistics Corp., and aims to reduce $CO_2$ emissions per unit production by 44% in FY2012, to 56% of the FY2000 level.
In FY2010, Toshiba Group achieved the goal of the fiscal year to reduce $CO_2$ emissions and emissions per unit production by taking such measures as choosing the optimal modes of transport, including a modal shift, raising the load factor for trucks, and consolidating distribution centers.

### ■ $CO_2$ emissions associated with product logistics




### ■ Breakdown of $CO_2$ emissions associated with product logistics in Japan in FY2010




By business segment

### Example: 2 Modal shift at overseas sites

**Toshiba Corp. Social Infrastructure Systems Company**

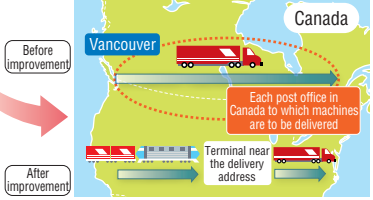
Social Infrastructure Systems Company shifted the means of overland transport in Canada from trucks to railways for the mail-sorting machines it exports to the country. In FY2010, it began to transport and deliver 160 machines to 16 cities across the country from Vancouver. It reduced packing volume and the number of containers necessary by improving the conventional one packing per module to a new form of one packing per two modules. It expects this will reduce $CO_2$ emissions by 5,209 tons annually.


Shift to two modules per packing

Reduction in the number of 40-foot containers used from **8 to 5** through minimizing packing volume (When using Stacker 304)

**Modal shift**

Reducing **$CO_2$** emissions by approx. **3 tons** per container by shifting to railway transport




### ● $CO_2$ emissions associated with overseas and international logistics (approximate figures)

Toshiba Group collects data on overseas and international logistics for the group and calculates approximate $CO_2$ emissions associated with such logistics.

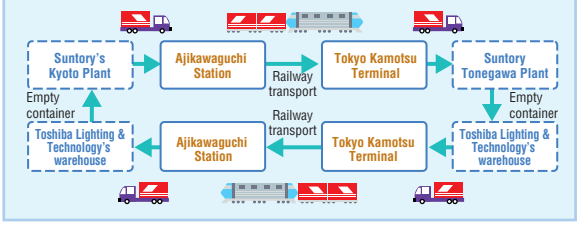
■ Total: 592,000 t-$CO_2$ (FY2010)
(Breakdown) Logistics in overseas countries: 26,000 t-$CO_2$
International logistics: 566,000 t-$CO_2$

### TOPICS An example of round transport using railway containers

**Toshiba Lighting & Technology Corp.**

Toshiba Lighting & Technology realized round transport by making joint use of railway containers with the Suntory Group. Previously, the company transported its products from Japan's Kanto to Kansai region using trucks. However, by replacing trucking with railway transport through joint use of containers, it was able to reduce $CO_2$ emissions and make transport more efficient. It expects to reduce $CO_2$ emissions resulting from transport by 140 tons annually.

**Round transport (conceptual diagram)**




## Use of renewable energy

Toshiba Group is continuously striving to use renewable energy for a wider range of its operations. In FY2010, the Group used 29,249 MWh's worth of renewable energy. Toshiba Television Central Europe switched to purchasing electricity supplied by hydroelectric power plants (for details, see P21). Toshiba Corp. has used a green power system since January 2005 and has since been purchasing two million kWh of electricity under a green power certificate annually.

## Contribution to the realization of a low-carbon society

Toshiba Group analyzes the various effects of global climate change on businesses from the perspectives of both risk management and business opportunities and endeavors to cope with these effects in its medium- and long-term management strategy. The recent Great East Japan Earthquake is expected to temporarily exert major effects on Toshiba Group, but it will continue to contribute to the realization of a low-carbon society through carbon risk management, including the implementation of energy-saving measures, while evaluating its present situation and identifying emerging regulatory and policy-making trends.

# Mitigation of Climate Change

## TOPICS Toshiba designs environmentally conscious plants

**Toshiba Television Central Europe (Poland) reduced $CO_2$ emissions by 1,850 tons annually by switching to electricity from hydroelectric power plants, a form of renewable energy, and optimizing power system operation.**


Toshiba Television Central Europe

## Switching to renewable energy sources for all purchased electricity

**Toshiba Television Central Europe, headquartered in Poland, is one of Toshiba Group's major production sites making LCD TVs for the European market.**

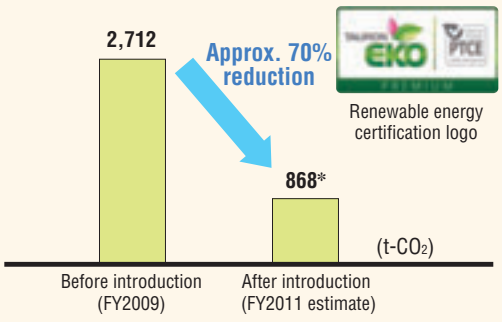
### ❶ Choosing renewable energy

The Polish government's energy policy aims to shift 15% of the country's energy to renewable sources by FY2020 and 20% by FY2030.
In January 2011, in accordance with this policy, Toshiba Television Central Europe switched its electricity purchasing from thermal power plants to hydroelectric power plants ahead of all other companies. Now, all of the electricity it purchases comes from renewable sources.
The Polish manufacturer purchases approximately three million kWh per hour annually, resulting in a reduction in $CO_2$ emissions of approximately 1,850 tons per year. The company has cut back $CO_2$ emissions by approximately 70% compared to FY2009, when its plants emitted a total of 2,712 tons, including gas.

### ❷ Optimization of power system operation

In FY2010, Toshiba Television Central Europe controlled and optimized the operation of the power system at its plants more carefully than in the previous year, mainly by reviewing the operating hours of compressors and ventilation systems. By doing so, the company reduced power consumption by 7% and $CO_2$ emissions by 168 tons annually.

■ **Effects of renewable energy, etc. for $CO_2$ reduction**




Renewable energy certification logo

✻$CO_2$ is generated during operation by part of the air conditioning system.

This compressor system reduces electricity consumption by 100 MWh annually.

**Reduced by 86 t-$CO_2$/year**

This ventilation system reduces electricity consumption by 100 MWh annually.

**Reduced by 82 t-$CO_2$/year**

# and laboratories in pursuit of leading-edge manufacturing

**Toshiba Corp.'s Fuchu Complex has reduced $CO_2$ emissions by 400 tons annually in its laboratory, which introduced a photovoltaic power generation system and the latest energy-saving equipment.**

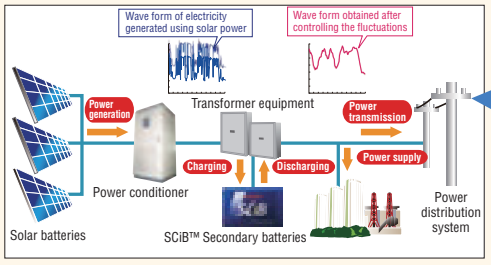
Building No. 11 (Laboratory) at Toshiba Corp.'s Fuchu Complex

## Establishing a new photovoltaic power generation laboratory with the latest energy-saving equipment

**The new laboratory at Toshiba Corp.'s Fuchu Complex, which was established with the latest energy-saving equipment in November 2010, is conducting experiments on next-generation electricity networks.**

### ❶ Introduction of a photovoltaic power generation system

The Fuchu Complex introduced a photovoltaic power generation system capable of generating 398 kW of electricity. By combining SCiB™ secondary batteries with this system to control fluctuations in system output more effectively, the Complex successfully reduced $CO_2$ emissions by 124 tons annually.



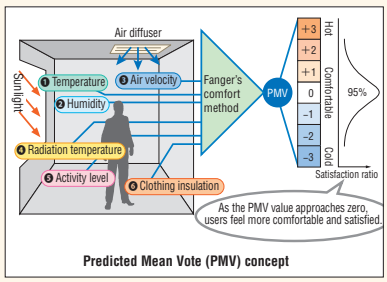

**Reduced by 124 t-$CO_2$/year**

### ❷ Making heat source equipment more efficient

The multi air conditioning system reduces $CO_2$ emissions by 37 tons annually by introducing high-efficiency air conditioning and realizing optimal operation using Neuro-PMV™ Control and Building Energy Management System (BEMS).

Multi air conditioning system

**Reduced by 37 t-$CO_2$/year**




### ❸ Introduction of LED lighting and lighting control systems

E-CORE™ LED lamps are used for the office area and outdoor lights. In addition, a system, which enables optimal lighting control by combining motion sensors, automatic dimmers, and other devices, is installed in the work area. These measures help reduce 112 t-$CO_2$ annually.

**Reduced by 112 t-$CO_2$/year**

### ❹ Controlling $CO_2$ emissions in the amount of ventilation

By using an inverter to control the amount of air taken in from the outside according to the concentration of $CO_2$ in the room, reducing the energy used by heat sources, and cutting back on the power used to convey outside air, the Complex reduced $CO_2$ emissions by 155 tons annually.

**Reduced by 155 t-$CO_2$/year**

# Efficient Use of Resources

**In order to reduce the volume of waste generated and finally disposed of, Toshiba Group will work to improve the use of resources on a continuous basis. In addition, we will also promote proactive recycling and strive to use water resources effectively.**

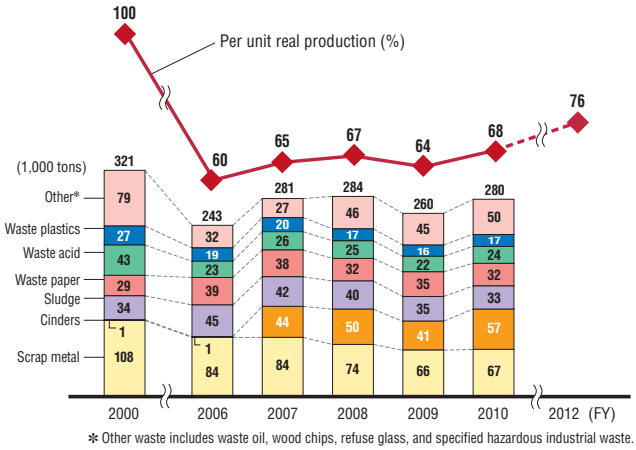
## Reducing the total waste volume

As part of its efforts to use resources effectively to create a sound material-cycle society, Toshiba Group aims to reduce the total volume of waste generated from production and other business processes, including items with value that are sold, by 24% compared to the FY2000 level on a per unit real production basis by FY2012. In FY2010, the total volume of waste generated on a per unit real production was 68% of the FY2000 level, a 32% reduction compared to the target of 20%. The total volume of waste generated was about 280,000 tons in FY2010. It increased by 20,000 tons from the FY2009 when the total volume of waste was reduced as the result of effects of decrease in production due to the economic downturn, but decreased by 4,000 tons compared to the FY2008 level.

## Reducing the amount for final disposal

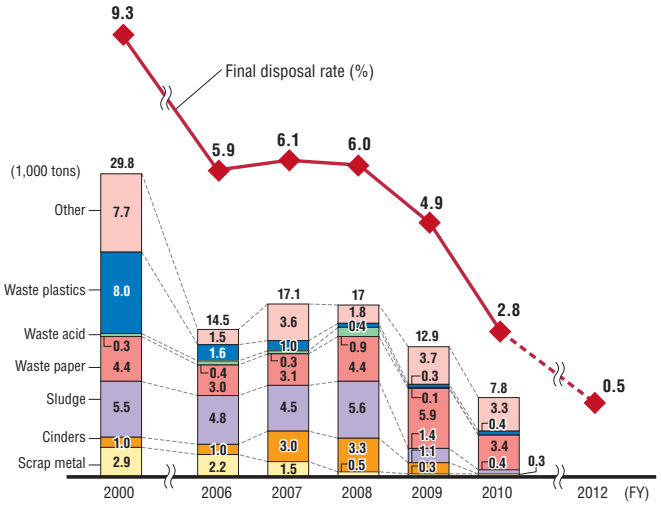
Toshiba Group aims to achieve zero waste emission (see note 4 on P12 for the definition)—an initiative of reducing final landfills to zero by reusing and recycling waste generated (including objects with value that are sold) at plants and other business sites as much as possible—at all its sites by FY2010. In FY2010, the percentage of sites that achieved zero waste emission to all Toshiba Group sites remained 83%. Since overseas sites with underdeveloped recycling systems and infrastructures were slow making progress in this area, Toshiba Group will continue its initiatives by, for example, further advancing activities that help identify and develop recyclers overseas mainly through information exchange with local governments and business partners.

### ■ Total amount of waste generated

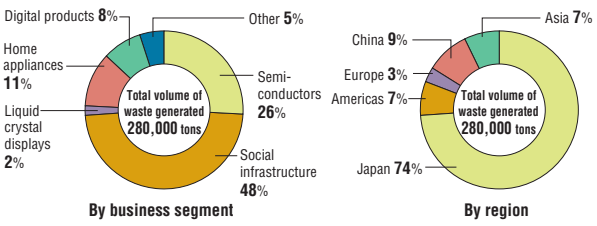



* Other waste includes waste oil, wood chips, refuse glass, and specified hazardous industrial waste.

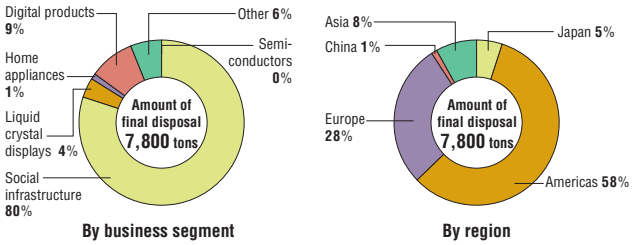
### ■ Final waste disposal amount and the final disposal rate




### ■ Breakdown of the total volume of waste generated (FY2010)




### ■ Breakdown of the amount of final waste disposal (FY2010)

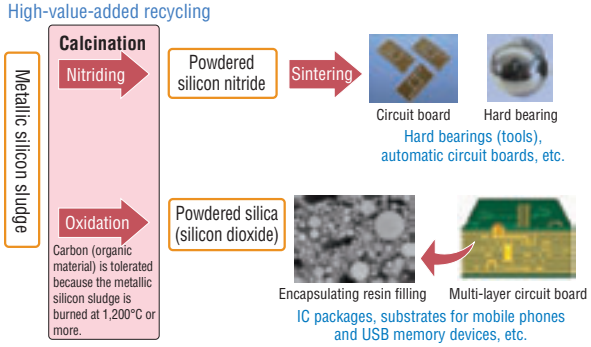



## Example: 1 High-purity recycling of silicon sludge

**Toshiba Corp. Semiconductor & Storage Products Company**

Toshiba Corp. Semiconductor & Storage Products Company researched the development of high-value-added recycling techniques for the silicon sludge generated during the manufacture of memory products (the process in which the back of wafers is polished) through an industry-academia-government joint research project involving Fukuoka Prefecture, the Kyushu Institute of Technology and other organizations. The project members developed a method of preventing other metals from mixing with the silicon as well as preventing oxidation of the silicon upon collection (such as during wastewater separation and film collection) and successfully transformed the silicon sludge into valuable material by inventing unprecedented methods of use (e.g., using the sludge as material for silicon nitride and silicon dioxide). As a result, the company realized substantial benefits, such as a reduction in waste volumes to one-third of their previous level and a halving of the volume of chemicals present in the wastewater.

### ■ High-value-added recycling of silicon sludge

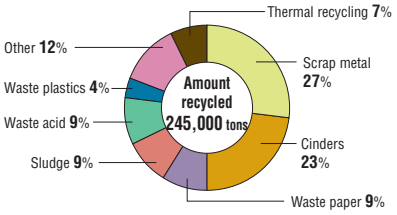


The final waste disposal volume for the entire Toshiba Group for FY2010 was 7,800 tons, a substantial improvement from the FY2009 level of 12,900 tons. The final disposal rate of 2.8% is also a substantial improvement compared to FY2009. The primary reason for this improvement is that in December 2009 a group company in the power generation business successfully began operation of an improved processing system which effectively recycles cinders, which had theretofore been disposed of in landfills as waste, as materials for cement. Going forward, Toshiba Group will sort waste more thoroughly and explore a wider range of applications for recycled waste.

### ● Promoting recycling

In FY2010, Toshiba Group recycled 245,000 tons of resources, 20,000 tons more than in FY2009. 88% of the waste generated was reused effectively as various resources. The recycled resources consisted mainly of scrap metal and cinders, and 93% of them were used effectively for material recycling (recycled into materials for products), and the remaining 7% for thermal recycling (heat recovery). In the future, Toshiba Group will continue to increase the total amount of resources recycled and at the same time will strive for higher quality recycling chiefly by increasing the percentage of resources recycled into materials.

### ■ Breakdown of the amount recycled (FY2010)



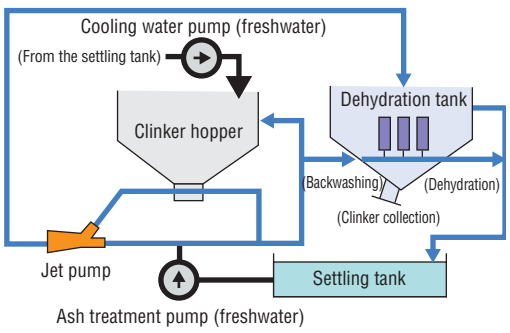

**Example: 2** **Introduction of a freshwater clinker treatment system**

**Sigma Power Ariake Co., Ltd.**

Sigma Power Ariake's Miike Power Plant is engaged in the coal-burning thermal power generation business. Previously, the clinker resulting from power generation was transported using seawater, and the salt remaining in the clinker rendered it unusable as material for cement, leading to it being disposed of in landfills. In December 2009, a system to transport the clinker using fresh water began operation, enabling the plant to recycle an average of approximately 3,900 tons of clinker as materials for cement annually.

* Combustion in the boiler generates ash particles which melt and solidify, falling to the bottom of the boiler. These particles are known as clinker.

### ■ Outline of the freshwater clinker treatment system




## Efficient use of water resources

As part of the measures to cope with water shortages worldwide, Toshiba Group is striving to reduce the volume of water it uses for its business operations. The goal of the Group is to reduce the volume of water received per unit real production by 10% compared to the FY2000 level in FY2012. The amount of water received per unit real production in FY2010 was reduced to 71% of the FY2000 level, a 29% reduction, far exceeding the goal of 9%. The amount of water received was about 50 million m$^3$, about 0.4 million m$^3$ less than in the previous year.

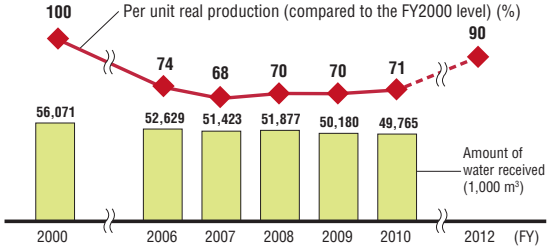
By business segment, the semiconductor business received more than half of the water. Therefore, Toshiba Group is pushing forward with initiatives for reducing water consumption in this segment.

Specific measures include reusing water resources by introducing wastewater treatment and collection systems into semiconductor production sites that consume much water and using a dry exhaust gas treatment process*. Thus Toshiba Group is reducing water consumption in a systematic way.

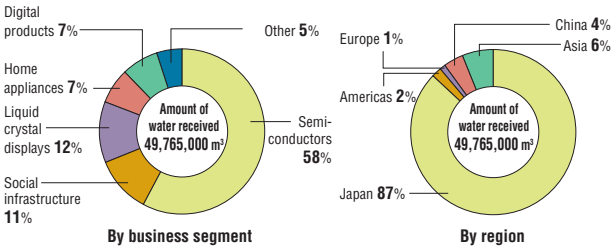
By region, Japan accounts for about 90% of the total amount of water received, but for regions where water is in short supply, the Group will steadily reduce the amount of water it receives by setting separate goals on a region-by-region basis.

* The conventional wet method involved treating waste perfluoro compound gas by decomposing it and then dissolving the fluorine in water. The dry process makes treatment water unnecessary by absorbing fluorine using calcium.

### ■ Amount of water received and that per unit production




### ■ Breakdown of the amount of water received (FY2010)



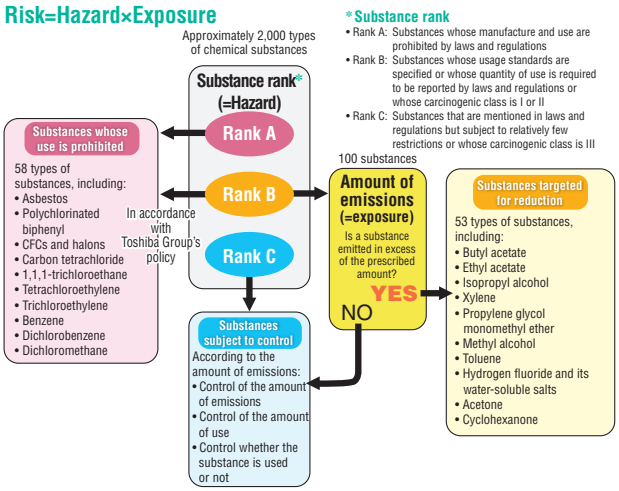
# Management of Chemicals

**Toshiba Group is striving to manage chemical substances appropriately in the processes of its business operations. Using alternatives, improving processes, and taking other measures, the Group is reducing usage of the targeted substances.**

## Managing chemical substances

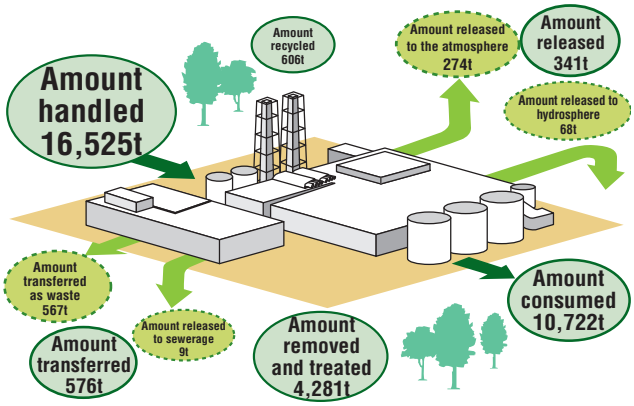
Toshiba Group classifies standards for the handling of chemical substances into the three categories of prohibition, reduction, and control, and manages chemical substances according to the regulations for each category. The relationship between substance ranking and management classifications, which shows the concept underlying this initiative, is indicated in the figure below. Approximately 2,000 types of chemical substances are classified into three ranks (hazard level A, B, and C) based on the regulatory levels set by environmental legislation, data on carcinogenic chemicals, and other factors. The classifications of prohibition, reduction, and control are determined by judging risks for each chemical substance using the product of the ranking of the substance and emissions equivalent to exposure to the substance.

### ■ Substance ranking and management classifications




### ■ PRTR-based material balance

The balance of Toshiba Group's total material volume based on the PRTR Law. http://www.toshiba.co.jp/env/en/industry/prtr.htm

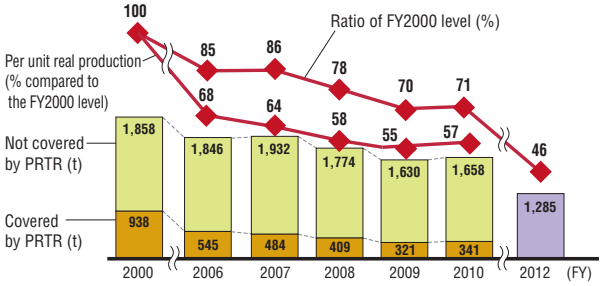



- The amount consumed refers to the amount of substances covered by PRTR that are changed into other substances by chemical reaction or transferred outside along with products whether they are contained therein or accompany them.
- The amount of removed and treated refers to the amount of substances covered by PRTR that undergo such processes as incineration, neutralization, decomposition, reaction treatment and are changed into other substances inside operation sites.
- Landfills at operation sites (stable, controlled, or isolated) are equivalent to the amount emitted. The amount released to public sewage is categorized as the amount transferred.
- The difference between the amounts transferred and recycled is determined based on whether fees are charged for recycling of the materials. Accordingly, waste is included in the amount transferred if Toshiba Group asks contractors to dispose of it and pay for the service even if the purpose is to recycle it.

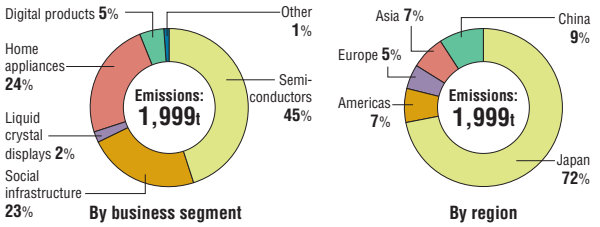
## Reducing emissions of substances

Toshiba Group strives to reduce the consumption of substances targeted for reduction if they have large direct impacts on the environment. By business segment, semiconductors, home appliances and social infrastructure systems account for over 90% of the total emissions of such substances, and by region, 70% of such emissions originate from Japan. In FY2010, Toshiba Group gave priority to taking measures for substances contained in cleaning solvents, which ranked high among such emissions, and promoted such initiatives as using alternative substances for the cleaning process, improving processes and introducing collection and recycling equipment. Toshiba Group reduced emissions of substances targeted for reduction by only 29% compared to the FY2000 level, failing to achieve its target for FY2010

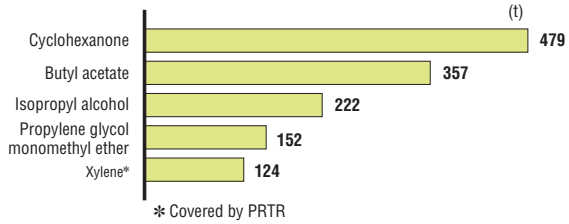
### ■ Emissions of substances targeted for reduction




### ■ Breakdown of emissions of substances targeted for reduction (FY2010)




### ■ Emissions of top five substances targeted for reduction (FY2010)




**Example**

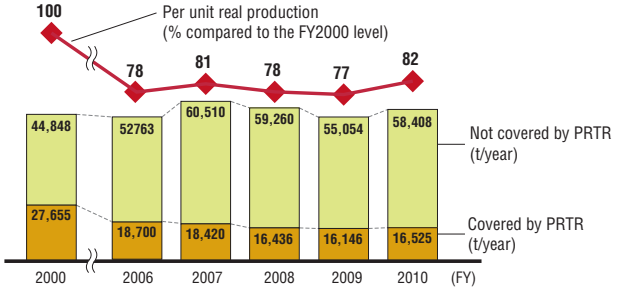
### Reducing methanol emissions through process improvements

**Toshiba Consumer Products (Thailand) Co., Ltd.**

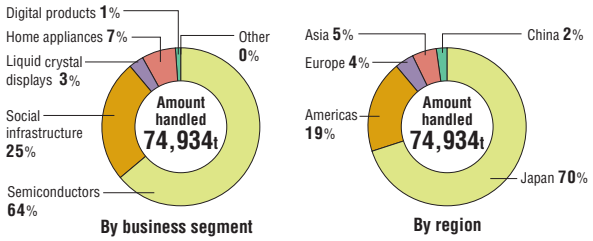
In the manufacturing process for refrigerators, methanol is used for cleaning and other purposes. Since much of it was being discharged into the atmosphere, however, Toshiba Consumer Products continued to take measures to reduce methanol emissions. In FY2009, the company started to use neutral detergents as an alternative, reducing methanol emissions by six tons annually. However, no alternative cleaning agent could be used to clean the insulating material which leaks during the process in which such material is injected into refrigerators due to the nature of the material. Thus in FY2010, in order to prevent the fundamental cause of the problem, methanol leaks, environmental management officers worked with the design and manufacturing departments to analyze the location where the substance was escaping. Through these efforts, the company improved the metal molds, sealed the leak, and dramatically cut back the amount of methanol used, thereby reducing methanol emissions from 16.0 tons to 3.7 tons annually.

as it was unable to make extensive capital investments in FY2009 due to the deterioration of the economy. From FY2011 and onward, the Group plans to use alternative substances and improve processes as an upstream countermeasure and introduce emission removal equipment as a downstream countermeasure.
A look at the substances handled, on the other hand, shows that semiconductors and social infrastructure account for more than 80% of the total, with substances used for chemical reactions and wastewater treatment ranked high. The material balance for PRTR-covered chemicals indicates that 26% of them are removed through neutralization and absorption and 65% are consumed together with the products that contain them, which taken together represent the majority of the chemicals handled. It also indicates that only about 2% of the chemicals used are discharged into the atmosphere or hydrosphere. Going forward, Toshiba Group will continue to ascertain how chemicals are being used and manage them properly.

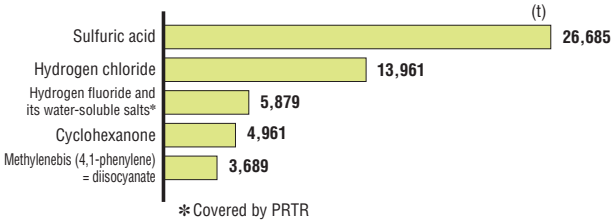
### ■ Amounts handled of substances targeted for reduction



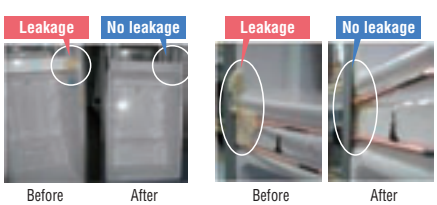

### ■ Breakdown of the amounts handled of substances targeted for reduction (FY2010)



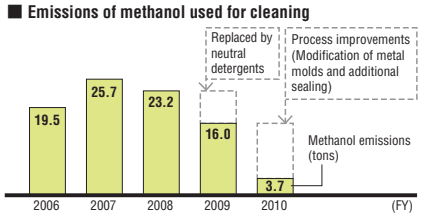

### ■ Amounts handled of top five substances targeted for reduction (FY2010)




*Covered by PRTR




### ■ Emissions of methanol used for cleaning




Refrigerator

## Management of substances that have impacts on the atmosphere and hydrosphere

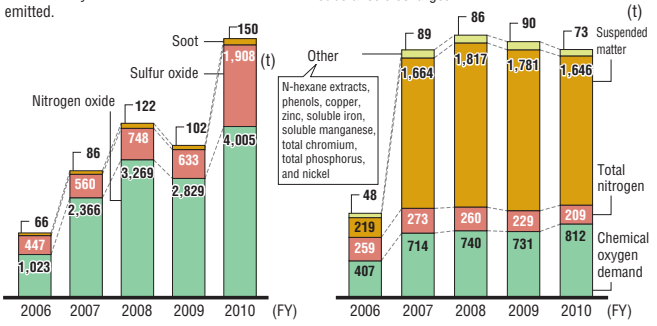
Toshiba Group is working to grasp the extent of emissions of sulfur oxides (SOX) and nitrogen oxides (NOX), both of which are major causes of air pollution, as well as water pollutants and ensure appropriate management of such emissions. Each business site voluntarily sets the maximum permissible levels of concentrations for these substances and complies with these prescribed standards, but total emissions fluctuate as production volumes increase or decrease.
Business sites in Europe and North America have already applied to wastewater the environmental impact risk assessment method (Whole effluent toxicity (WET) method), which uses biological indicators. Those in Japan have also started to consider using it as a new indicator of wastewater management (for details, see P16).

### ■ Impacts on the atmosphere

In accordance with the Air Pollution Control Act, the amount of impact is calculated by multiplying the concentration of each substance by the amount of the substance emitted.

### ■ Impacts on the hydrosphere

In accordance with the Water Pollution Control Act, the amount of impact is calculated by multiplying the concentration of each substance by the amount of the substance discharged.

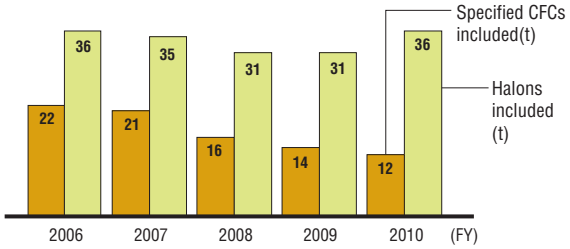



*Starting FY2007, data include those for Sigma Power Ariake and Sigma Power Tsuchiura.

## Management of ozone-depleting substances

Previously, Toshiba Group used chlorofluorocarbons (CFCs), trichloroethane, and other ozone-depleting substances as coolants for refrigerators as well as for the cleaning of parts, the dry-etching of semiconductors, and for the forming of heat insulators. Of these, the use of specified CFCs for cleaning was completely discontinued in 1993, and that for inclusion in products in 1995.
On the other hand, Toshiba Group manages air-conditioning systems, fire-extinguishing equipment, and other products that include CFCs and halons by affixing stickers to them stating that they include the substances. CFCs and halons are collected and treated appropriately when the products are no longer used. Currently, 1,950 air conditioning systems and 1,149 fire-extinguishing facilities use CFCs and halons, and the amounts of specified CFCs and halons included in these products are 12 tons and 36 tons, respectively. Toshiba Group treats CFCs and halons properly, though the amount of these substances owned by the Group is increasing due to improved data collection.

### ■ Amount of specified CFCs and halons included in products



# Response to Environmental Risks

**Toshiba Group is working to purify contaminated soil and groundwater by ascertaining the present condition of soil and groundwater at its business sites. The Group's basic policy is to prevent chemical substances from contaminating soil and groundwater and identify environmental liabilities such as PCB-containing equipment and dispose of such equipment in a systematic way.**

## Soil and groundwater purification

Toshiba Group is working to purify contaminated soil and groundwater by ascertaining the present condition of soil and groundwater at its business sites. The Group is also taking safety measures for environment-related equipment to prevent contamination with chemicals and reduce environmental risks. A survey of all business sites confirmed contamination at 17 sites, where soil and groundwater contamination with volatile organic compounds (VOCs) has been purified, and the results are being monitored. VOCs in groundwater are collected and eliminated mainly using the water pumping method.

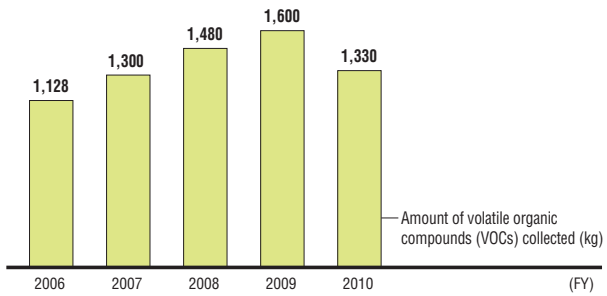
Toshiba Group uses the water pumping method to purify soil and groundwater mainly in areas with high concentration of VOCs, but if the VOC concentration in such areas is lowered due to progress in purification, the Group still plans to maintain the amount of VOCs collected at 1,000 kg/year or more by taking such measures as stepping up water pumping efforts in other areas with relatively high VOC concentrations. In FY2010, approximately 1,300 kg of VOCs were collected. The amount collected decreased slightly compared to the previous year because the amount of VOCs collected per liter of water pumped is gradually decreasing due to reduced VOC concentrations resulting from purification. In the future, Toshiba Group will continue to advance soil and groundwater purification using appropriate methods, taking into account world trends in the progress of purification technology. At the same time, it will strive to ensure full communication with local governments and residents in neighboring areas through tours of purification facilities and other public relations activities.

### ■ Purification of soil and groundwater contaminated with volatile organic compounds

| Business site | Location | Progress in purification | Purification method*1 | Amount collected*2(kg) |
|---|---|---|---|---|
| Fukaya Operations, Toshiba Corp. | Fukaya City, Saitama Prefecture | Being monitored*3 | A | — |
| Toshiba Electric Appliances Co., Ltd. | Maebashi City, Gunma Prefecture | Being monitored | D, F | — |
| Former site of Asia Electronics Inc.'s Yokohama Operations | Yokohama City, Kanagawa Prefecture | Being monitored | A, E, G | — |
| Komukai Operations, Toshiba Corp. | Kawasaki City, Kanagawa Prefecture | Purification in progress | A, G | 94.4 |
| Microelectronics Center, Toshiba Corp | Kawasaki City, Kanagawa Prefecture | Purification in progress | A | 11.5 |
| Himeji Operations (Semiconductors), Toshiba Corp. | Taishi Town, Ibo County, Hyogo Prefecture | Being monitored (North district) | D, F, G | — |
| | | Purification in progress | A | 278.2 |
| Himeji Operations, Toshiba Corp. | Himeji City, Hyogo Prefecture | Work in progress that will allow purification measures to be taken | C, E, F | — |
| Oita Operations, Toshiba Corp. | Oita City, Oita Prefecture | Purification in progress | A | 1.1 |
| Fuji Operation Center, Toshiba Carrier Corp. | Fuji City, Shizuoka Prefecture | Purification in progress | A, B | 267.3 |
| Tsuyama Operation Center, Toshiba Carrier Corp. | Tsuyama City, Okayama Prefecture | Purification in progress | A, B | 2.0 |
| Former site of Toshiba Components Co., Ltd.'s Yokohama Works | Yokohama City, Kanagawa Prefecture | Purification in progress | A | 0.2 |
| Kawamata Seiki Co., Ltd. | Kawamata Town, Date County, Fukushima Prefecture | Purification in progress | A | 0.1 |
| Kitashiba Electric Co., Ltd. | Fukushima City, Fukushima Prefecture | Purification in progress | A | 0.3 |
| Former site of Toshiba Shomei Precision Corp.'s Kawasaki Works | Kawasaki City, Kanagawa Prefecture | Being monitored | A, B, F | — |
| Former site of Toshiba Lighting & Technology Corp.'s Iwase Works | Sakuragawa City, Ibaraki Prefecture | Purification in progress | A | 0.1 |
| Ibaraki Plant, Lighting Device & Fixture Corp. | Joso City, Ibaraki Prefecture | Being monitored | A | — |
| Kimitsu Operations, Toshiba Components Co., Ltd. | Kimitsu City, Chiba Prefecture | Purification in progress | A, B | 674.8 |

*1 Purification method: (A) groundwater pumping, (B) soil gas suction, (C) reduction decomposition, (D) oxidation decomposition, (E) interception containment, (F) removal by excavating soil, and (G) bio-activation.
*2 Amount collected: Amount collected from April 2010 to March 2011.
*3 Monitoring: Monitoring to confirm how things develop after work that will allow measures to be taken or purification is completed.

### ■ Amount of volatile organic compounds (VOCs) collected (17 locations listed above)




**Example: 1** **Environmental measures**

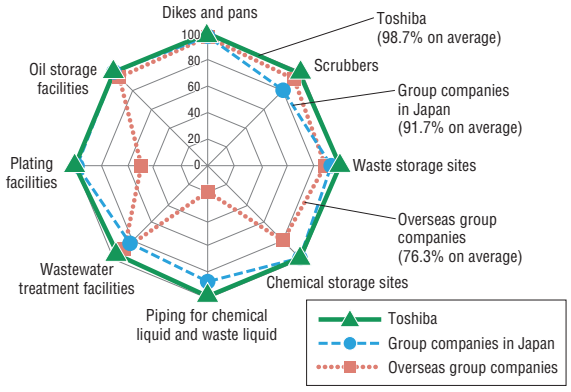
**Himeji Operations, Toshiba Corp.**

In May 2009, Toshiba Corp.'s Himeji Operations took the opportunity to retire some of the manufacturing units on its premises and start soil investigations of its own accord. Since April 2010, based on the results of these investigations, Himeji Operations has taken measures to remove volatile organic compounds and heavy metals from the soil in cooperation with the relevant government agencies.

## Preventing contamination and reducing contamination risks

In order to prevent contamination with chemical substances and reduce contamination risks, Toshiba Group independently established the Structural Design Guidelines to prevent leaks of chemicals at its eight types of environment-related facilities such as wastewater treatment plants, and its overseas sites are also promoting continuous improvements in this area. In FY2010, Toshiba Group achieved a compliance rate of 98.7% for all of Toshiba's sites and 91.7% for all of its group companies' sites in Japan.
In its overseas operations, at the time of establishing a new business or relocating a business, Toshiba Group also assesses contamination risks by investigating land use and contamination histories. Assessments are made in accordance with laws and regulations in each country, and Toshiba Group's own rigorous standards are applied in countries without relevant legislation.

■ **Rate of compliance with the Structural Design Guidelines (FY2010)**




### Example: 2 Measures to prevent leaks of chemicals at environment-related facilities


## Identifying environmental liabilities

With the enforcement of the Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes, keepers of PCB waste are required to dispose of PCB waste appropriately by July 2016. At March 2011, Toshiba Group reported environmental liabilities of approximately 9.2 billion yen as expenses for the outsourcing of disposing of PCB waste by making it harmless. These expenses cover the disposal of such items as PCB-containing products stored and managed at business sites nationwide. The Westinghouse Electric Company group, a consolidated subsidiary of Toshiba Corp., complies with U.S. federal, state, and other local legislation concerning the discharge of pollutants, disposal of hazardous waste, and other activities that lead to environmental pollution. These have affected and are expected to affect Toshiba Group in the future, but the status of legislation and regulations, the ability to identify sites that require removal of contamination, waste disposal capacity, and other conditions are uncertain, and therefore, it is difficult to accurately estimate final costs incurred by, and the time required for, future decontamination. Of those costs, approximately 6.6 billion yen in environmental liabilities was reported as a loss that could reasonably be estimated in March 2011. The amount of environmental liabilities will be revised according to the progress in environmental assessments and purification work, technological innovation, and the new demands of legislation. These do not have serious effects on the financial condition and business performance of Toshiba Group, but the Group will continue to identify and disclose its environmental liabilities properly in the future.

## Storage and management of PCB

Since 1972, when the manufacture of products using polychlorinated biphenyl (PCB) was discontinued in Japan, Toshiba Group has kept PCB and PCB-containing products under strict surveillance, controlled them, and reported their storage to the relevant authorities in accordance with the Waste Management and Public Cleansing Act and the Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes. In addition to meeting the prescribed storage standards, the Group makes doubly sure through the installation of dikes and double containers and other measures that they are stored appropriately.
In order to treat PCB and PCB-containing products safely and as swiftly as possible, Toshiba, along with group companies, has registered some 7,400 transformers and condensers with Japan Environmental Safety Corporation (JESCO), which started to provide wide-area PCB treatment services in FY2005. In FY2010, about 230 transformers and large condensers were treated. In the future, Toshiba Group will continue to treat PCB and PCB-containing products properly in accordance with JESCO's treatment plans.

PCB-containing equipment being transported to Japan Environmental Safety Corp.

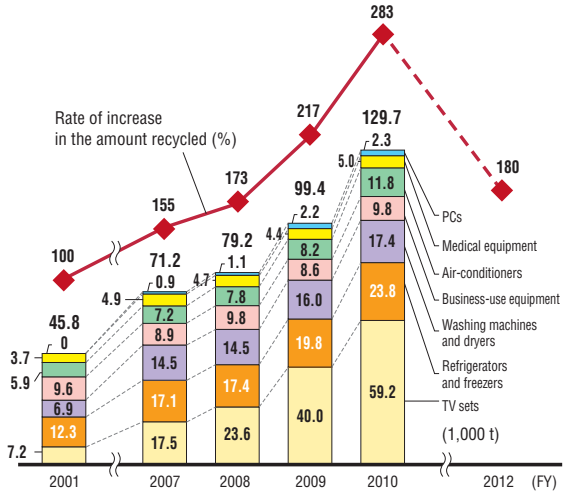
# Recycling of End-of-Life Products

**Toshiba Group is expanding the recycling of end-of-life products globally. In Japan, too, the Group is actively promoting the recycling of end-of-life products centered on waste home appliances and personal computers.**

## Recycling end-of-life products globally

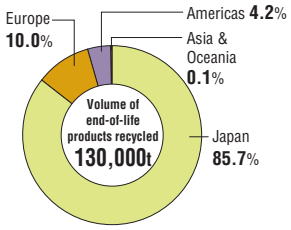
In order to ensure efficient use of resources and appropriate treatment of hazardous substances, in accordance with recycling regulations in each country and territory of the world, Toshiba Group is promoting the collection and recycling of products that customers have discontinued to use. In order to minimize collection and recycling costs as it complies with each country's recycling scheme, the Group aims to increase the volume of end-of-life products recycled by 180% compared to the 2001 level by 2012. In Japan, in addition to products covered by the Law for the Recycling of Specified Kinds of Home Appliances, the Act on the Promotion of Effective Utilization of Resources, and other relevant laws, it has established a unique scheme to collect medical equipment, elevators, MFP/POS systems, and other products. Toshiba Group also responds appropriately to the Directive on Waste Electrical and Electronic Equipment (WEEE) in Europe*1 and state laws in the United States. Furthermore, it is preparing to respond appropriately to recycling-related laws enacted in China and expected to be enacted in the future by governments in Asia, Oceania, Central and South America and other regions. In FY2010, in Japan and abroad, Toshiba Group collected about 166,000 tons of end-of-life products, of which it recycled about 130,000 tons. The Group increased the weight of end-of-life products recycled by 283%, exceeding the goal*2 substantially for FY2010, because both the volume of four types of waste home appliances collected under the eco-point system in Japan and that of end-of-life products collected in Europe and North America were increased. In the future, Toshiba Group will continue to increase the volume of end-of-life products collected and recycled in Japan and establish a collection scheme in a wider range of its overseas locations.

### ■ Volume of end-of-life products recycled (global)




### ■ Breakdown of the volume of end-of-life products recycled (FY2010)

Looking at the volume of end-of-life products recycled by region, in Japan 86% of the total volume is recycled, with four types of home appliances accounting for the bulk of this. Major items collected and recycled in Europe, which has the next highest recycling ratio after Japan, include TV sets, PCs, multifunctional peripherals (MFPs), and medical equipment. In the U.S., major items include TV sets and PCs. Increasing the volume of end-of-life products collected and recycled in China and other Asian countries is a future issue to be addressed.

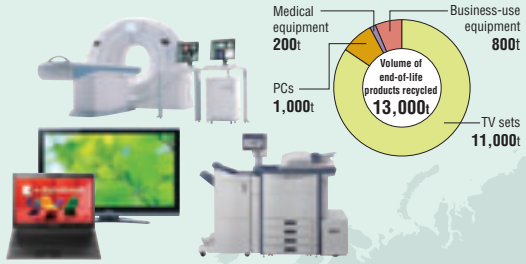



By region

### ■ Volume of end-of-life products recycled by region (FY2010)

**● Europe: 13,000 tons**

In accordance with the WEEE Directive, Toshiba Group is collecting and recycling end-of-life products throughout Europe.

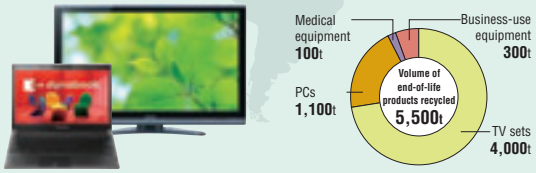



**● Japan: 111,000 tons**

In addition to the four types of home appliances and PCs, business equipment is also collected and recycled.

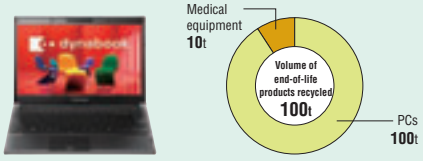

**● Americas: 5,500 tons**

Toshiba Group is collecting and recycling end-of-life products such as TV sets and PCs through MRM*3, a recycler.




**● Asia and Oceania: 100 tons**

Toshiba Group is expanding its PC recycling program globally. In countries in Asia and Oceania, including Singapore, Australia and New Zealand, the Group is working on a PC recycling program voluntarily.




*1 The WEEE Directive is a directive of the European Union concerning waste electrical and electronic equipment.

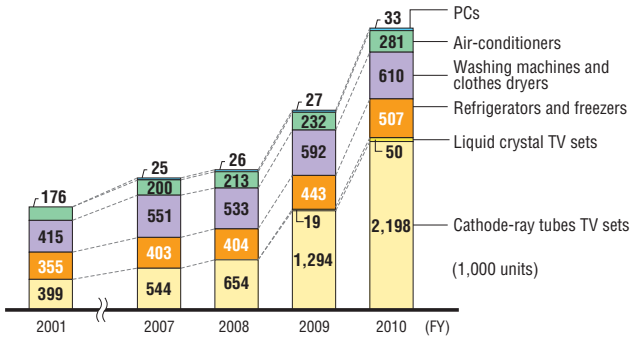
*2 The FY2010 goal was to increase the weight of end-of-life products recycled by 160% compared to the FY2001 level.

*3 Electronic Manufacturers Recycling Management Company, LLC (MRM) is a recycling management firm established jointly with Panasonic Corp. and Sharp Corp. in September 2007. For more details visit its website: http://www.mrmrecycling.com/

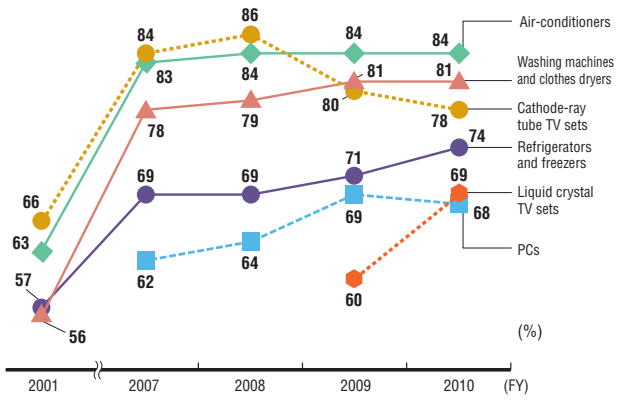
## Recycling of end-of-life products in Japan

In Japan, Toshiba Group is collecting and recycling end-of-life products in accordance with the Law for the Recycling of Specified Kinds of Home Appliances and the Act on the Promotion of Effective Utilization of Resources.
The number of four types of home appliances collected in FY2010 was approximately 3.64 million. It rose substantially (up 141% compared to the previous year) due to the effects of the eco-point system in addition to an increase in the amount collected thanks to the understanding and cooperation of customers and other relevant parties. The number of these appliances collected by Toshiba Group represented about 13% of the total of all such appliances collected in Japan. Although the Great East Japan Earthquake damaged designated collection sites, recycling plants and other related facilities commissioned to handle disposal of four types of home appliances and other services, Toshiba Group has been providing support since immediately after the earthquake, taking emergency measures to ensure the stable operation of these facilities.
A total of 33,000 end-of-life PCs, a 122% increase compared to the previous year, were collected from businesses and homes for recycling.

### ■ Number of four types of home appliances and PCs collected in Japan




### ■ Percentage of four types of home appliances and PCs recycled in Japan




## Development and application of recycling technology

Toshiba Group is working to develop and apply recycling technology to properly treat hazardous substances and effectively collect and recycle valuables including iron, copper, aluminum and plastic.

### Example: 1 Recycling flat-panel TV sets more efficiently

**Nishinihon Kaden Recycle Corporation**

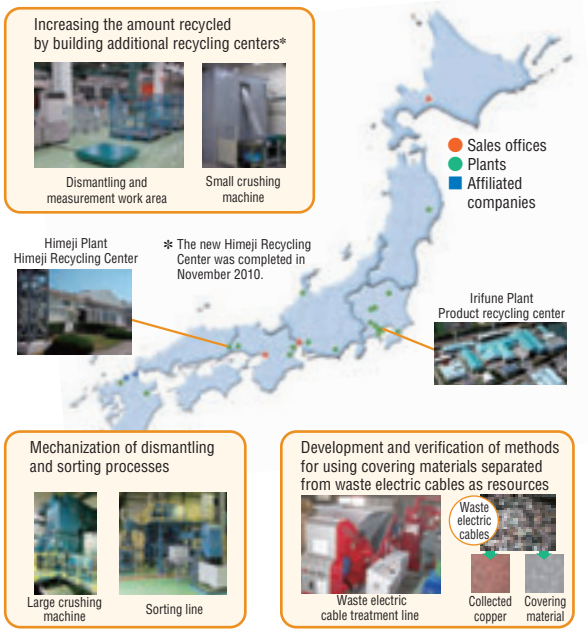
Nishinihon Kaden Recycle Corporation has introduced workbenches that incorporate equipment to hold flat-panel TV sets and systems to help workers to disassemble them or separate their components before placing them on the dismantling line. Through this and other measures, the company is promoting development by reducing workers' workload and ensuring that dismantling and recycling work is performed safely and efficiently. The company also without fail collects mercury, which is contained in the cold cathode fluorescent lamps (CCFLs) used as backlights, and treats it appropriately by taking measures to prevent its dispersion and using a system to absorb it.

Equipment to disassemble large TV sets

### Example: 2 Increasing the amount of end-of-life products recycled

**Term Corporation**

Term has established a nationwide recycling network that consists of 21 plants, three sales offices, and two affiliated companies. The company is contributing to the effective use of resources by increasing the amount of intermediate disposal, which involves dismantling, crushing and sorting end-of-life machinery and tools, PCs, OA equipment, etc. It is also working to build lines to recycle flat-panel TV sets efficiently.



# Greening of Products
# Environmentally Conscious Products

## We are striving to promote and expand the uses of environmentally conscious products (ECPs) in order to achieve the highest level of environmental performance.

### Summary of activities in FY2010



## Aiming to achieve the highest level of environmental performance for all products

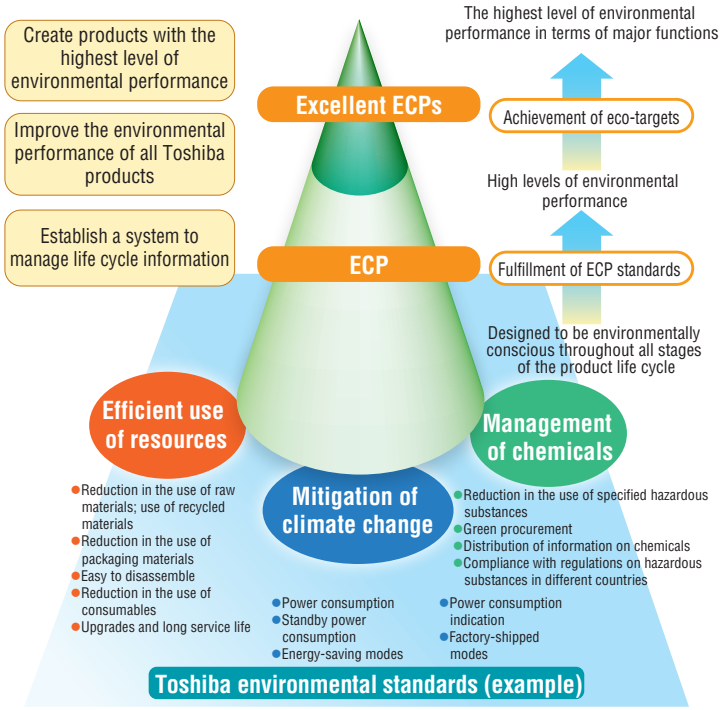
While various energy-saving initiatives have been implemented in developed countries, the wider use of home appliances and digital equipment in emerging countries resulting from their economic growth is raising concerns about increases in environmental impact due to increased consumption of energy and resources. Manufacturers have a responsibility to support convenient and comfortable lifestyles while minimizing environmental impact.
Toshiba Group is making every effort to improve the environmental performance of its products and to achieve the highest level of performance for all products that it develops. As a result of our efforts, in FY2010 we were able to certify 16 products—which had the highest level of environmental performance upon their release (or announcement of release)—as Excellent ECPs (for details, see P33).

## Initiatives for the Greening of Products

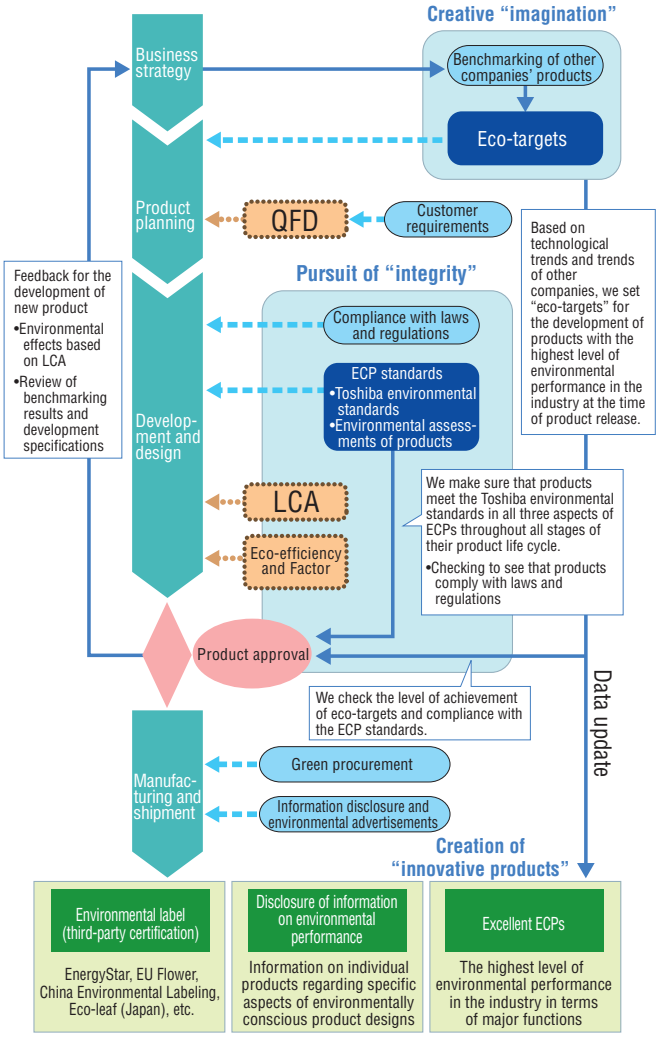
The Greening of Products refers to our initiatives aimed at promoting the development of Environmentally Conscious Products (ECPs). To promote the Greening of Products, we operate in accordance with the following procedures.
In the business strategy formulation and product planning stages, we set "eco-targets" to develop products with the highest level of environmental performance. Then, in the product development and design stages, we make environmental assessments of the products to ensure that they comply with laws and regulations as well as meet the ECP*1 standards (the Toshiba environmental standards) in all three aspects*2 throughout all stages of their life cycle. In the product approval stage, we check the level of achievement of the eco-targets and whether the products are in compliance with the ECP standards, certifying those products with the highest level of environmental performance at the time of their release as Excellent ECPs.

*1 ECPs (Environmentally Conscious Products) are designed to minimize environmental impact throughout all stages of their life cycle, including during procurement of materials, manufacture, distribution, use, disposal and recycling.
*2 Mitigation of climate change, efficient use of resources and management of chemicals

## ■ Basic Policies on the Greening of Products

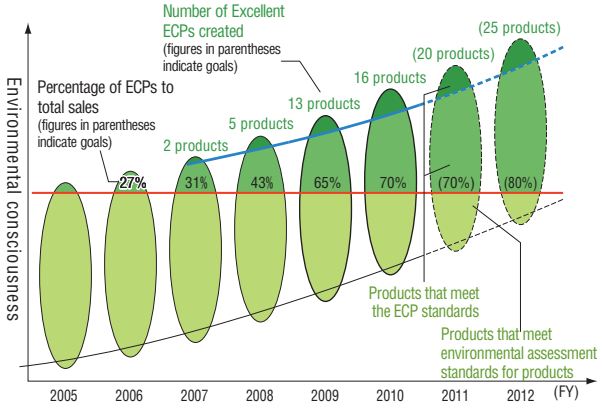



## ■ System for the Greening of Products




# Creation of Excellent ECPs and ECPs

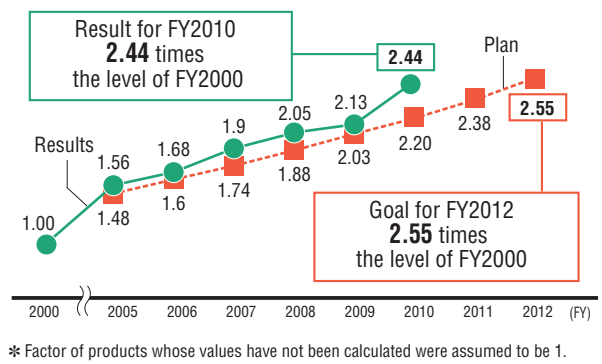
Under the Fourth Environmental Action Plan, Toshiba Group is working to improve the environmental performance of all its products by increasing the percentage of ECPs to total sales and, through the development of Excellent ECPs, create products with the highest level of environmental performance in the industry. In FY2010, the percentage of ECPs to total sales was 70%, which exceeded the goal of 60%, while the number of Excellent ECPs newly created was 16, which also exceeded the goal of 15 (for details, see P33).




# Aiming to increase product ecoefficiency by 2.55 times in FY2012

Viewing the eco-efficiency of products (for details, see P43) as an important indicator, Toshiba Group is promoting activities to create ECPs. Our goal is to increase the product eco-efficiency by 2.55 times by FY2012 compared to the level of FY2000. By the end of FY2010, we calculated the Factor values (degree of improvement in ecoefficiency) for 90% of all Toshiba Group products. By enhancing the value of products and by reducing their environmental impact, Toshiba Group was able to achieve a Factor of 2.44, which far exceeded the goal of 2.2.

**Product eco-efficiency** = Value of a product / Environmental impact of a product



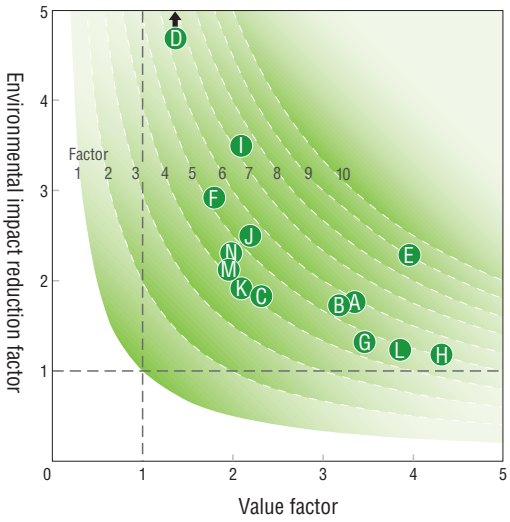

✻ Factor of products whose values have not been calculated were assumed to be 1.

# Excellent ECPs

## Products Certified as Excellent ECPs in FY2010

ECPs with the industry's highest level of environmental performance are certified as Excellent ECPs (for details, see P32). Two products were certified as Excellent ECPs in FY2007, five in FY2008, 13 in FY2009 and 16 in FY2010. With a view to expanding the range of environmentally conscious products, we certify not only home appliances and digital products but also products in the social infrastructure field as Excellent ECPs.

| | FY2007 | FY2008 | FY2009 | FY2010 |
|---|---|---|---|---|
| Home appliances | Notebook PC<br>LED lighting | Notebook PC<br>LED light bulb<br>LCD TV<br>Washing machine with dryer | LED light bulb<br>LCD TV<br>Washing machine with dryer<br>Home air conditioner<br>Refrigerator<br>Hard disk drive | Ⓐ Mobile notebook PC: Portégé R830<br>Ⓑ A/V notebook PC: Qosmio F60<br>Ⓒ Business notebook PC: TECRA A11/S11<br>Ⓓ LED mini krypton bulb: LDA5N-E17<br>Ⓔ LCD TVs: 47RE1, 55F1 and 46F1<br>Ⓕ Washing machine with dryer: TW-Z9100<br>Ⓖ Home air conditioner: JDR series<br>Ⓗ 2.5-inch hard disk drive: MK7559GSXP<br>Ⓘ Blu-ray player: BDX1100 series |
| Industry products | | X-ray CT system | LED indoor lighting<br>LED outdoor lighting<br>Air-cooled chilling unit<br>Office air conditioner | Ⓙ Heat source system: Universal Smart X<br>Ⓚ Office air conditioner: Super Module Multi-i<br>Ⓛ Diagnostic ultrasound system: Aplio™ MX<br>Ⓜ Open showcase: SF-453DP-LSN-SA |
| Parts | | | Rechargeable battery<br>X-ray tube | Ⓝ Motor for rolling stock: Permanent Magnet Synchronous Motor (PMSM) |




For details on the Factor, see P43.

## Diagnostic Ultrasound System

Reduces environmental impact while achieving high image quality with high diagnostic capabilities

Factor **4.73** = Value factor **3.85** × Environmental impact reduction factor **1.23**

### Aplio™ MX (October 2009 release)

Benchmark product: Toshiba's equivalent model for FY2001

**Winner of the Eco-Products Awards Steering Committee Chairperson's Award, 7th Eco-Products Awards (Eco-Products category)**

**As a pioneering model of medical equipment designed based on environmental standards, this product was well received for its environmentally conscious design throughout all stages of its product life cycle.**

#### Major features

- Wide range of advanced clinical applications in a compact unit
  - Realtime high-resolution 4D
  - Multiviewing, differential diagnosis of mammary gland tumors, etc.
- Further improvements in basic performance
  - Reduced number of dedicated PWBs by implementing functions in software
  - Improved system efficiency by employing highly integrated circuits operating at low voltage
  - Improved sensitivity and frequency bandwidth of transducer elements
  - Enhanced system operability etc.

#### Environmental performances

- Energy-saving features
  - Power consumption reduced by 35%
  - Expanded application of modal shifts (acquired "Eco Rail Mark" certification)
- Resource-saving features
  - Product Mass reduced by 32%, product volume by 50%
  - Packing materials (cardboard) reduced by 30%
- Chemical management
  - No PVC was used where users may touch -i.e., the external covers and the ultrasound probe holders

| Factor | = | Value factor | × | Environmental impact reduction factor |
|---|---|---|---|---|

## Notebook PCs

Environmentally conscious PCs designed to provide high performance while remaining lightweight

| Factor | = | Value factor | × | Environmental impact reduction factor |
|---|---|---|---|---|
| 5.95*1 | | 3.35 | | 1.78 |

Benchmark product: dynabook 2650 (2000 model)

### Winner of the 7th LCA Society of Japan Awards, JLCA Chairman's Award

**Our continuous efforts of environmentally conscious design through the product lineup and proactive environmental appeal are highly evaluated.**

### Major features

**Portégé R830*2 (March 2011 release)**

- Mobile notebook PC
  - A mobile notebook PC equipped with a high-performance CPU
  - Casing made of thin magnesium plates (0.45 mm thick)
  - Long battery life and low power consumption

**TECRA A11/S11 (February 2010 release)**

- Business notebook PC
  - A high-performance, high-reliability, full-fledged business PC (Robust design, high performance CPU, SSD model)
  - Thin & light and compact design for increased mobility

**Qosmio F60 (January 2010 release)**

- A/V notebook PC
  - High resolution graphics system
  - Sound system with high audio quality
  - Four major A/V functions (PC, TV, Blu-ray player, sound system)

### Environmental performances

- External assessment
  - EPEAT® Gold rating (U.S. model)
- Energy-saving features
  - Compliant with ENERGY STAR criteria
  - Low power consumption: Less than 50% of the ENERGY STAR TEC*3 criteria (R830)
  - Performance far exceeding the EU ErP Directive's standby power consumption limit; meets the 2013 requirement (not exceeds 0.5 W) (R830)
  - Equipped with Toshiba eco-utilities
- Resource-saving features
  - Robust design: equipped with the Toshiba PC Health Monitor software and spill resist keyboard (excluding the F60)
  - HDD protection (equipped with a 3D acceleration sensor)
- Chemical management
  - No PVC used in the PC main body (R830)

The above features apply to all models unless otherwise specified.

*1 In case of R830
*2 Successor to the R700
*3 TEC: Typical Energy Consumption

## SCiB™ rechargeable battery

Efficiently uses energy to contribute to reducing waste and $CO_2$ emissions

| Factor | = | Value factor | × | Environmental impact reduction factor |
|---|---|---|---|---|
| 4.63 | | 2.62 | | 1.77 |

Benchmark product: Lithium ion battery

### Certified as an Excellent ECP in FY2009

Eco-Efficiency Award 2010

### Winner of the Eco-Efficiency Special Award, Eco-Efficiency Awards 2010

**This product was well received for its improved environmental efficiency, including its long product life which contributes to reducing waste and its creation of customer value through its various applications.**


### Major features

- Use of Toshiba's original lithium titanium oxide anodes
  - High level of safety
  - Rapid charging capacity with 90% of the battery capacity charged in as fast as 5 minutes
  - Long product life: lasts for more than 6,000 discharge-recharge cycles
  - Usable in cold environments (-30°C)

### Environmental performances

- Resource-saving features
  - Product life increased 3 to 5 times compared with conventional lithium ion batteries and a reduction in maintenance frequency and in the amount of waste materials
  - Creation of a new recycling-based business model through the cascade use of batteries
- Energy-saving features
  - Contributes to the realization of a low-carbon society when installed in electric scooters, HEVs/PHEVs, EVs and other vehicles.

### Applications

12 V lighting use


24 V E-bikes


Electric Scooters

Electric Vehicles (EVs)

i-MiEV "M" 10.5 kWh

We will seek to further expand the range of applications to create new value for our customers.

# Excellent ECPs

## Home air conditioner

The industry's highest energy-saving performance*1
Equipped with a real-time monitor that displays electricity costs

Factor 4.55 = Value factor 3.46 × Environmental impact reduction factor 1.32

### Daiseikai JDR series (November 2010 release)

Benchmark product: RAS-406YDR (2000 model)

#### Major features

- Sterilization with pico ions
  - Sterilization and moisturization functions
- Dash heating
  - Can produce 40°C air in about one minute even on freezing mornings
- Real-time monitor
  - Displays power consumption and electricity costs

#### Environmental performances

- Reduced energy during actual use
  - The industry's highest level of performance (APF*2: 6.2)
  - Sensors for optimal operation; electricity consumption reduced by a maximum of approximately 45% compared with normal cooling
  - Power consumption during "breeze" operation is 45 W, nearly the same as that of an electric fan (about one yen per hour)
- Chemical management
  - No PVC used in the drain hose

*1 As of product release
*2 APF: Annual Performance Factor

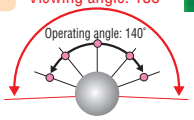
#### Key technologies

1. Motion and lighting sensors for automatic, optimal operation

Detects human movement with an active motion search function to realize optimal operation

Conserves energy at night with a lighting sensor

Viewing angle: 185°

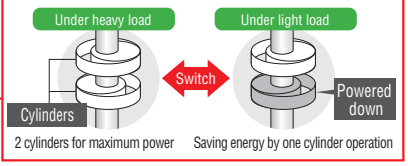



Right and left visual fields

2. Dual compressor

Minimum power consumption: 45 W

The air conditioner uses two cylinders during initialization and when operation demands a large amount of power; one cylinder automatically stops operating when the machine can be operated with a small amount of power.




## Washing Machine with Dryer

The world's first washer/dryer equipped with an active suspension
Improved cleaning capability and reduced washing time

Factor 5.25 = Value factor 1.79 × Environmental impact reduction factor 2.93

### TW-Z9100 (September 2010 release)

Benchmark product: TW-F70 (2000 model)

#### Major features

- Cleaning capability
  - Unfolds clothes by centrifugal washing and washes with high-pressure double showers
  - Uses antibacterial water to reduce the odor of sweat and the smell of clothes dried indoors
- Washing time
  - About 35 minutes when washing clothes weighing 9 kg
- Sterilization with pico ions
  - Able to sterilize and deodorize even non-washable clothes

#### Environmental performances

- Energy-saving features
  - Unfolds clothes by centrifugal drying, in addition to heat-pump dehumidification/drying, to further improve energy-efficiency
  - Industry's lowest level of power consumption: 730 Wh (when washing and drying clothes weighing 6 kg) (as of product release)
- Resource-saving features
  - Consumes 65 L of water when performing centrifugal washing (when washing clothes weighing 9 kg)
  - Reduces water consumption with eco-mode operation
  - Product weight reduced to 80 kg through reducing the number of parts

#### Key technologies

1. Active control system

ACTIVE S-DD motor for adjusting the magnetic force

Active suspension which adjusts the tension of the suspension to absorb drum vibrations (the world's first model with an active suspension)

**Centrifugal washing**
**Centrifugal drying**
**Low levels of noise and vibration**
**Decreased washing time**

2. Eco sensor

Controls the amount of water and detergent in accordance with the amount of clothes by using a high-accuracy clothing detector with a variable magnetic force motor

Predicts the water temperature from the air temperature and controls washing time accordingly

Detects the types of cloth (the percentages of different types of cloth, such as cotton or synthetic fibers) and controls the amount of water used for rinsing

**Reduces water use by a maximum of about 7%**

Factor = Value factor × Environmental impact reduction factor

# Motor for rolling stock

High efficiency for drastically reduced energy consumption
A totally enclosed structure so that the inside requires no cleaning throughout its service

Factor **4.39** = Value factor **2.04** × Environmental impact reduction factor **2.15**

Benchmark product: Self-ventilating open induction motor (IM) (2000 model)

## Permanent Magnet Synchronous Motor (PMSM) (mass-produced from 2009)

### Major features

- High efficiency
  - Traction motor efficiency improved by 97% by using permanent magnets
- Low noise level
  - Noise level reduced by approximately 12 dBA compared with conventional IMs
- The inside requires no cleaning
  - The totally enclosed structure almost completely prevents dust from entering the motor; consequently, the inside requires no cleaning throughout its service.

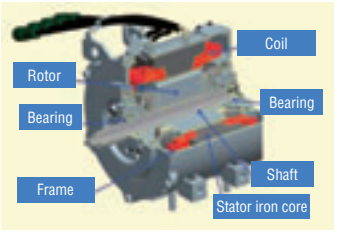
### Environmental performances

- Saving energy
  - Energy consumption reduced by approximately 20% (based on measurement on the Tokyo Metro Company's commercial Ginza line 01 series; measurement from November 18, 2007 to June 30, 2008)
- Resource-saving features
  - Eliminates the need to disassemble the motor thanks to the totally enclosed structure; reduces maintenance time and the amount of waste

### Key technologies

#### 1. Use of permanent magnets

Using permanent magnets for the rotor eliminates the need for rotor bars and rings, thereby reducing the amount of heat generated compared with conventional IMs and also making it possible to create a simple structure which does not require cooling fins nor a radiator.




#### 2. Totally enclosed self-ventilation structure

Prevents dust from infiltrating the motor; the inside requires no cleaning

Bearing units can be replaced without disassembling the motor

Reduces the noise by drastically reducing the ventilation noise

→ **Reduces maintenance and increases product life**

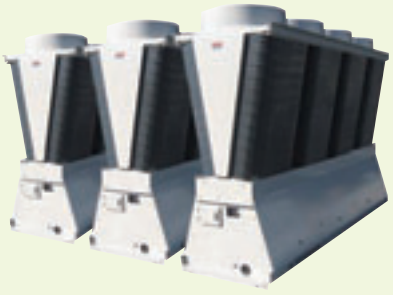
# Heat source system

A heat source system with air-cooled heat pumps for a wider range of applications

Factor **5.47** = Value factor **2.19** × Environmental impact reduction factor **2.49**

Benchmark product: TAG-C009 (2000 model)

## Universal Smart X (October 2010 release)



### Major features

- Expanding the range of uses for heat pumps
  - A wide range of applications, including provision of hot water, appropriate cooling at data centers and similar facilities, use in factory manufacturing processes, and temperature management in wastewater treatment
- Maximum output of 4,800 horsepower
  - A maximum of 12 units can be combined using module controllers; a maximum of 8 sets can be operated together using group controllers (for a maximum total of 96 units)

### Environmental performances

- Energy-saving features
  - Cooling: COP 6.3 (30 HP high-COP model)
  - Integrated Part Load Value* (IPLV): 7.5 (30 HP high-COP model)
- Space-saving features
  - Footprint reduced by 34% compared with the previous model (SFMC)

* Value calculated by taking into consideration the part load properties when operating the system for cooling at 50 Hz (compliant with the ARI550/590-2003 model)

### Key technologies

#### 1. Inverter twin rotary compressor

Expands the range of applications

Size increased with our original technology to achieve the world's largest capacity*

Range of operation expanded to include low temperatures as little as -15°C, medium temperatures in the range of 25°C to 30°C and high temperatures as much as 55°C

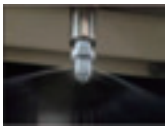
* As of October 2010 (as researched by Toshiba Carrier Corp.)

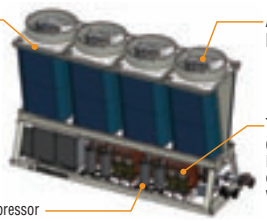
#### 2. Module-in-module structure

Each module is composed of four independent refrigerant circuits; even if one circuit stops, the other circuits can maintain high output levels.

→ **Improving efficiency while reducing risks**

New nozzle model for the evaporative condenser
High-efficiency water spray using the heat of vaporization





A new large-diameter fan and a high-efficiency DC motor

Two plate water heat exchangers connected in series
Improved heat conduction performance on the water side; usable in environments with large temperature differences

Inverter twin rotary compressor

# Mitigation of Climate Change

In order to promote developments aimed at mitigating climate change, Toshiba Group assesses the entire life cycle of products. We will continue to provide energy-saving products for countries around the world and to reduce $CO_2$ emissions to contribute to the mitigation of climate change.

## $CO_2$ emissions reductions by supplying eco products considering throughout their life cycles

In order to mitigate climate change, Toshiba Group is striving to develop environmentally conscious products which reduce environmental impact throughout their life cycle from the procurement of raw materials, manufacturing and distribution to the use and disposal stages.

Toshiba Group's products cover a wide range of categories from consumer electronics to power generation plants, and $CO_2$ emissions generated by these products in different stages of their life cycle vary from one product to another. For example, digital products like notebook PCs cause environmental impact mainly during the procurement of materials, while semiconductor products, such as SD memory cards, cause most of their environmental impact during manufacturing. Meanwhile, the $CO_2$ emission from power consumption during the use of products accounts for the bulk of the impact caused by products that consume a large amount of energy and those that are used for a long period of time, which leads us to believe that the most effective way to reduce their environmental impact is to reduce the amount of power consumed when they are used.

For this reason, with a view to appropriately evaluating its diverse product portfolio, Toshiba Group calculates the annual reductions in $CO_2$ emissions that would be achieved if products purchased in FY2000 were replaced by eco products not only during their use but also throughout their entire life cycle in order to achieve a greater reduction in $CO_2$ emissions. To this end, we have added new indicators as the $CO_2$ emission-reduction effect of eco-products to the Fourth Environmental Action Plan which have been in effect since FY2008.

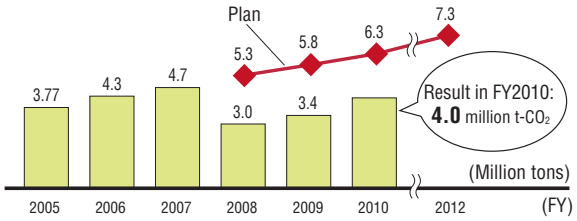
In FY2008, we fell far short of achieving our goal as a result of rapid economic changes. Therefore, we formed a working group to promote measures to mitigate climate change through products and have been implementing group-wide activities to achieve the goal.

In FY2010, we set eco-targets regarding the mitigation of climate change in order to develop products with the highest level of environmental performance. As a result, we were able to reduce $CO_2$ emissions by 4 million tons per year by offering newly developed products throughout the world. Although we fell short of our annual goal, we achieved a reduction of 600,000 tons per year in $CO_2$ emissions compared to the previous year, exceeding our plan of reducing emissions by 500,000 tons of $CO_2$ per year, and we continue to make improvements.

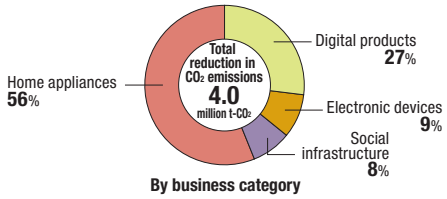
Toshiba Group will continue to reduce $CO_2$ emissions across all its products by identifying key factors that contribute to reducing $CO_2$ emissions and by sharing advanced examples and core technologies among group companies. At the same time, we will expand our business in global markets for home appliances, such as digital products that use substantially less energy and LED light bulbs—especially in markets in emerging countries where there is a rapidly growing demand for products that can achieve great reductions in $CO_2$ emissions.

We will create products with the highest level of energy-saving performance that can achieve greater reductions in $CO_2$ emissions per product unit by promoting product design aimed at saving energy throughout the entire product life cycle and will work to maximize reductions in $CO_2$ emissions by providing our products to as many customers as possible.

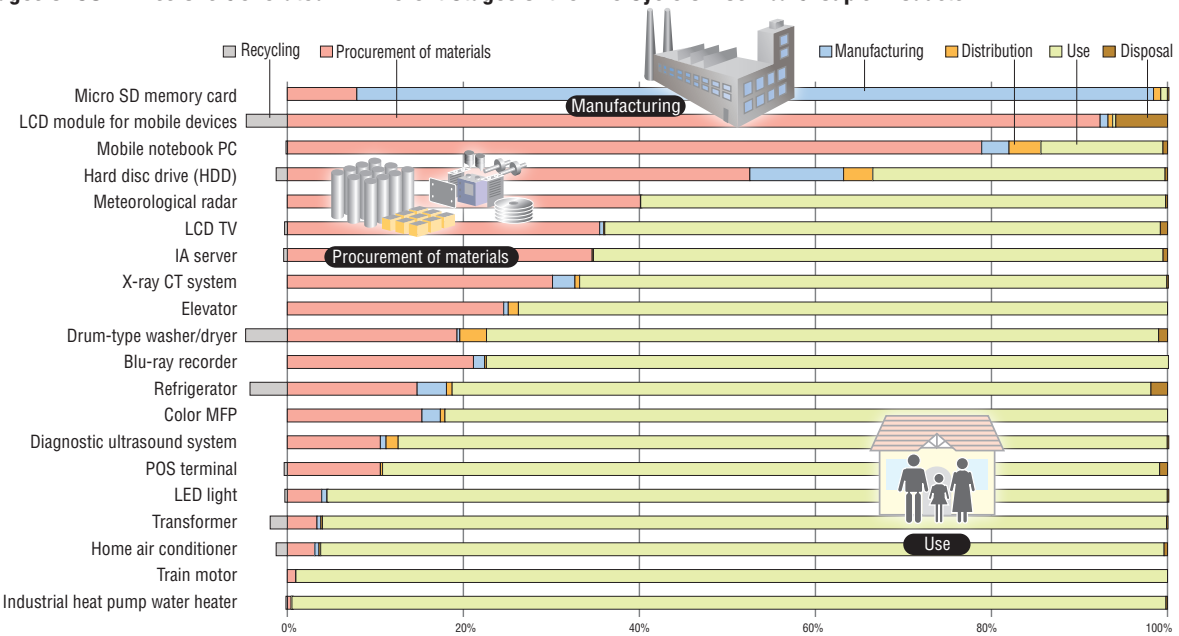
### ■ Annual Reductions in $CO_2$ Emissions through eco products




### ■ Breakdown of Reductions in $CO_2$ Emissions




### Percentages of $CO_2$ Emissions Generated in Different Stages of the Life Cycle of Toshiba Group's Products



## Reducing $CO_2$ emissions worldwide through products with the highest level of energy-saving performance

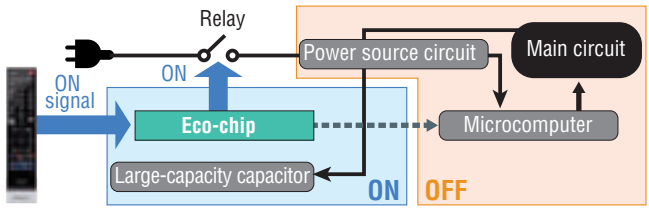
Although about half of the reductions in $CO_2$ emissions in FY2010 was achieved by products for Japanese markets, Toshiba Group's products, such as LCD TVs, PCs and air conditioners, are contributing to reducing $CO_2$ emissions in Europe and the United States as well.
Reductions in $CO_2$ emissions achieved in emerging countries account for only about 10% of the total at present. However, now that there is a rapidly growing demand for home appliances and digital equipment in these countries, we need to support convenient and comfortable lifestyles while mitigating climate change by providing products with a high level of energy-saving performance throughout the world.
Environmental impact caused by the use of products varies depending on the type of energy supply available in different areas. Average $CO_2$ emissions coefficients for electricity of the area are used to calculate estimated reductions in $CO_2$ emissions in Japan, Europe, the United States, Asian countries and China. Global average values are used to calculate estimated reductions in other areas and reductions regarding products, including parts, that are manufactured for no specific areas.
In its global business development, Toshiba Group will continue to contribute to the mitigation of climate change through its energy-saving products in areas around the world.


* The photo is for illustrative purposes only.

### Example Saving electricity easily with Toshiba's Eco-chip for reducing standby power to zero*

Toshiba Digital Products & Services Company

Unplugging unused electrical appliances allows one to reduce total power consumption by reducing standby power to zero. However, doing so also creates problems, such as rendering it impossible to record TV programs by timer. To resolve this difficulty, Toshiba has developed a low power consumption Eco-chip that makes it possible to disconnect AC power during standby and to reduce electrical devices' standby power consumption to zero without unplugging the device via a remote controller. The Eco-chip will contribute to reducing the power consumption of electrical devices that consume large amounts of electricity during standby, such as TVs and DVD recorders.




**A mechanism that enables standby power consumption to be reduced to zero**

- The large-capacity capacitor is charged during normal operation
- When entering standby mode, the relay circuit disconnects the AC power, and the large-capacity capacitor supplies power only to the low power consumption Eco-chip to operate.
- After about 12 hours of standby operation, the power circuit is initialized to recharge the large-capacity capacitor*.

* Recharging the large-capacity capacitor takes about five minutes and consumes 0.13 W of power.

# Efficient Use of Resources

Toshiba Group promotes 3R (reduce, reuse and recycle) initiatives for products and packaging to reduce waste and increase incoming and outgoing recycling.

## Toshiba Group's 3R* Initiatives for Products

In order to create sound material-cycle society, there is a need to reduce the amount of resources extracted and discharged as waste throughout the product life cycle. Toshiba Group is promoting 3R initiatives for products aimed at reducing waste, improving outgoing recycling and increasing incoming recycling. We are also taking measures to promote design for 3Rs of product and service system and are implementing activities to reduce the environmental impact of our products throughout their life cycles.

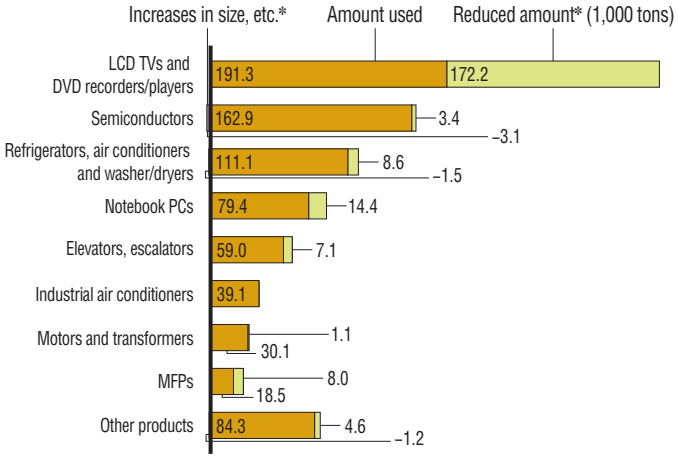
We achieve waste reduction through various means, including reducing the amount of resources used to manufacture products (reducing weight and size) and extending product lives (including upgrades and maintenance).

Outgoing recycling refers to the collection and recycling of end-of-life products. By promoting designs for reusing and recycling materials, we improve outgoing recycling while simultaneously improving the system design for recycling end-of-life products further.

Incoming recycling refers to the application of recycled materials in products. We will work to improve our incoming recycling rate by increasing our use of recycled materials, plant-derived materials and reuse parts.

* Reduce, reuse and recycle


■ **Amount of Resources Used by Toshiba Group and Reductions in Resource Consumption (FY2010)**




* Calculated by comparison with the previous product models adjusting for the expected number of years of use

**Example: 1 Blu-ray players** Reduce

Toshiba Digital Products & Services Company

The BDX1100 model (equivalent to the SD-BD2 in the Japanese market) is the industry's lightest and smallest Blu-ray player (as of product release), weighing 1.63 kg with a thickness of 360 mm. We reduced the body weight by 29%, packaging volume by 44% and packaging weight by 36% compared with the previous model (BDX2000). Also, the model consumes only 11.1 W during playback (reduced by 40% compared with the previous model) and was certified as an Excellent ECP for FY2010 (for details, see P33) as the industry's first Blu-ray player compliant with the Energy Star 2.0 standards.

## Waste Reduction Initiatives

In FY2010, the total amount of resources used in Toshiba Group's major products, estimated by multiplying the amount used for products and packaging materials by the number of shipments, was 776,000 tons. Based on comparisons with the previous product models and adjusting for the expected number of years of use, we also estimated to what extent resource consumption has been reduced for different products. Our comparisons show that despite increases in the use of resources in some product categories as a result of increases in size and functionality improvements, we have reduced the use of resources by 214,000 tons, equivalent to 27.5% of the total amount of resources actually used in FY2010. This result is largely due to reductions in the size and thickness of digital products, including LCD TVs, DVD players, notebook PCs and MFPs. We will continue to make efforts to reduce resource consumption for all of our products.

## Outgoing Recycling Initiatives

To improve outgoing recycling, Toshiba Group promotes designs that facilitate reusing and recycling products. We provide Environmental Design Guides and Eco-material Selection Guides for our member companies and share information concerning the disassembling of various products. At the same time, we review areas for improvement with respect to designs for reuse and recycling by promoting technological exchanges between designers and recyclers.

It is also essential to develop systems for recycling end-of-life products. Although we have been promoting such recycling globally, there is an increasing need to develop new recycling technologies and advanced systems to manage rare metals. We will design such advanced recycling systems by considering how to strike a balance between environmental and economic performance (for details, see P30).

## Incoming Recycling Initiatives

Toshiba Group is promoting initiatives to recycled plastic waste generated by end-of-life products*. In FY2010, we extended our use of recycled plastics to new products (vacuum cleaners and office air conditioners) and also to new refrigerator parts. Consequently, we used a total of approximately 900 tons of recycled plastics in these and similar products, such as the base plates of washing machines, multifunctional peripherals (MFP), LCD TVs and notebook PCs. We also use plant-derived resins for some of the plastic parts in POSs, lighting devices and LCD TVs. We will continue to expand the uses of recycled materials, thereby improving the incoming recycling rate.

When upgrading office air conditioning systems (multi-purpose air conditioners, package air conditioners and customized air conditioners), we reuse old pipes (the indoor pipes leading to the outside) instead of removing or replacing them with new pipes. In FY2010, we reused a total of 137 tons of old piping. In addition, we also promote incoming recycling through the reuse of MRIs, elevators, fax machines and LCD panels.

Our efforts to expand the uses of recycled materials will further improve the incoming recycling rate.

* Note: Post-consumer recycled materials vary in quantity available and quality depending on how they are obtained. At times, we may need to use virgin materials due to insufficient supply or quality problems.

Recycle

### Example: 2 Use of recycled plastics in home appliances

Toshiba Home Appliances Corp.

Dewatering drums and other collected waste

Vegetable boxes and other collected waste

Material for recycled plastics

We use plastic materials recycled from the dewatering drums of washing machines and refrigerator vegetable boxes collected from waste home appliance processing plants to manufacture various products. We have started to use recycled plastic materials not only for washing machines with dryers and refrigerators but also for vacuum cleaners.

Base plate

TW-Z9100

Condenser-fixing device

GR-D55F

Motor cover

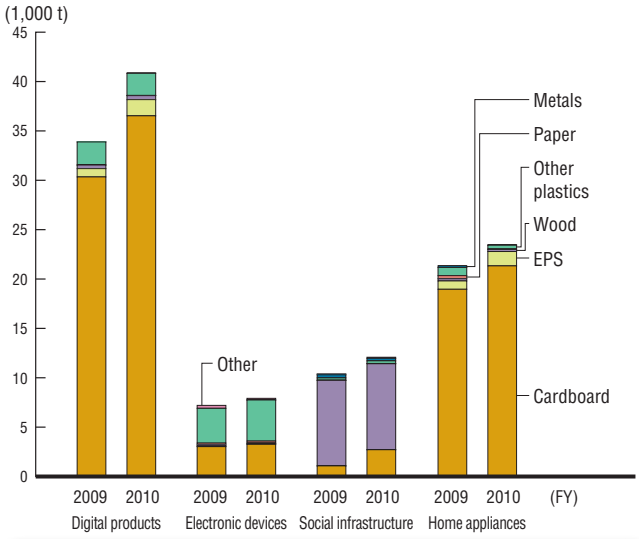
VC-CG510X

## 3R Initiatives for Packaging Material

We will streamline the use of packaging as well as product materials to reduce environmental impact throughout their entire life cycles. The amount of packaging materials used by Toshiba Group in FY2010 was 85,000 tons*. As the number of shipments increases, the amount of packaging materials used also tends to increase. Nevertheless, we will work to reduce the use of packaging materials in accordance with the characteristics of each business area and product category through various measures, such as reducing packaging volume (see the example), enlarging the size of returnable (reusable) cases and using materials with low environmental impact.

* We collected a wider range of data than in FY2008.

■ **Amount of Packaging Materials Used by Toshiba Group**

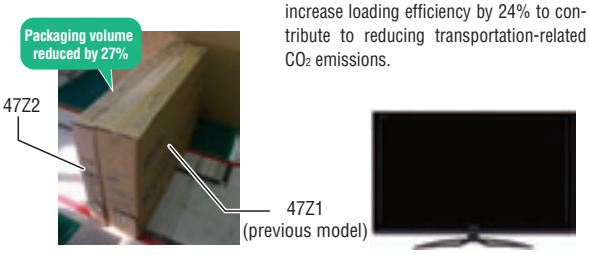



### Example: 3 Ultra-thin packaging for LCD TVs

Reduce

Toshiba Digital Products & Services Company

We have achieved to reduce packaging volume by 27% compared with the previous product model (47Z1) as a result of our efforts to improve packaging design, including reviewing the layout of contents, optimizing the volume of expanded polystyrene and reducing the width of the LCD TVs. Consequently, we were able to increase loading efficiency by 24% to contribute to reducing transportation-related $CO_2$ emissions.



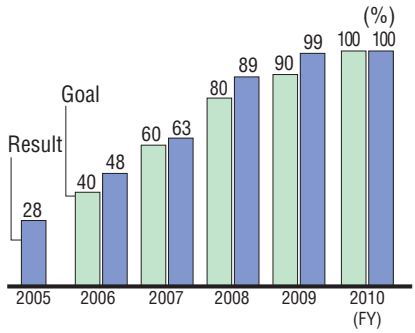
# Management of Chemicals

Toshiba Group implements measures to minimize risks involved in the use of chemicals, including formulating action plans. We also promote green procurement to minimize environmental impact and implement measures to comply with new regulations.

## Elimination of the Use of Specified Chemicals

With a view to achieving the goal of minimizing risks involved in the use of chemicals, which was proposed and adopted at the World Summit on Sustainable Development (WSSD) and other conferences, Toshiba Group promotes initiatives to eliminate the use of specified chemicals, to use substitute materials and to reduce and manage the amount of chemicals contained in products so that customers can use Toshiba products with a sense of security.
The Fourth Environmental Action Plan, which started in FY2005, identified 15 rank-A chemical substance groups and made it a goal to eliminate the use of all these chemicals by FY2010. The percentage of products that do not contain these substances relative to the total sales reached 100% in FY2010 as specified in our action plan.

### ■ Ratio of sales of products with 15 substance groups eliminated to net sales



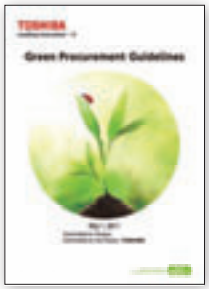

15 chemical substance groups subject to restriction (rank A)

(1) Bis (tributyl tin) oxide (TBTO)
(2) Tributyl tins (TBTs) and Triphenyl tins (TPTs)
(3) Polychlorinated biphenyls (PCBs)
(4) Polychlorinated naphthalenes (PCNs with 3 or more chlorines)
(5) Short-chain chlorinated paraffins (C10-C13)
(6) Asbestos
(7) Azo colorants
(8) Ozone-depleting substances
(9) Radioactive substances
(10) Cadmium and its compounds
(11) Hexavalent chromium compounds
(12) Lead and its compounds
(13) Mercury and its compounds
(14) Polybrominated biphenyls (PBBs)
(15) Polybrominated diphenyl ethers (PBDEs)

✻ Detailed definitions and exempted uses are provided separately.

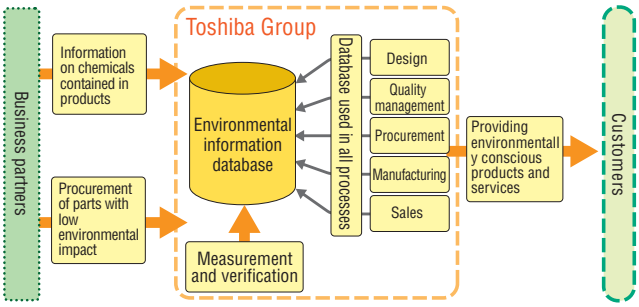
## New Guidelines for Green Procurement

There is a need to assess the environmental impact of products throughout all stages of their life cycles, from manufacturing and use by customers through to reuse and recycling after they have reached the end of their useful lives. As part of Toshiba Group initiatives to reduce environmental impact in the manufacturing stage, we are promoting green procurement.
In 1999, Toshiba Group established the Green Procurement Guidelines*1 to procure low environmental impact products, parts and materials from suppliers who actively promote environmental conservation. Responding to the globalization of the product market and our supply chain, we revised these guidelines to meet the needs of the times in consideration of related laws and regulations in countries around the world, including the European RoHS Directive*2 and China's Measures for Administration of the Pollution Control of Electronic Information Products. In FY2011, we added new substance groups to our list and made comprehensive revisions to our guidelines. Our information on parts and materials is stored in a database and used for various purposes, including certifying newly procured materials, making judgments as to whether or not to replace existing materials with substitutes, or developing environmentally conscious products.



*1 http://www.toshiba.co.jp/procure/en/green/index.htm
*2 RoHS (Restriction of certain Hazardous Substances) Directive: A directive which limits the use of specified hazardous substances in electrical and electronic devices

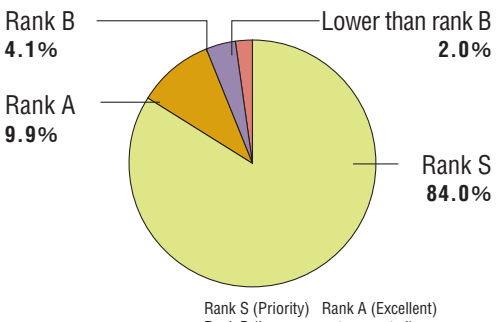
### ■ Creating a procurement database, including parts and raw materials




## Activities through the Supply Chain

To promote business activities aimed at reducing the environmental impact of hazardous chemicals and the risks involved in using them, it is essential to obtain the cooperation of suppliers, our business partners, for those activities for which the supply chain as a whole must be targeted. We request the understanding and cooperation of our suppliers in our green procurement initiatives aimed at creating a sustainable society. We also request that they make environmental assessments and conduct research on and evaluations of the chemicals contained in the materials and parts they supply and report the results of independent assessments on their level of green procurement (according to Toshiba's standards) in accordance with ISO 14001.

### ■ Suppliers' Levels of Green Procurement for FY2010 (93.9% of our priority suppliers ranked S or A)




Rank S (Priority) Rank A (Excellent)
Rank B (Improvement requested)
Lower than rank B (Improvement requested)

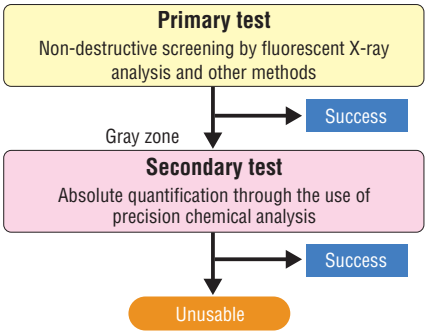
We give priority to highly evaluated suppliers. Through audits and other means, we make requests to our suppliers to improve their levels of green procurement.
In addition, the REACH*1 regulations, which have been enforced in Europe since June 2007 to control chemical substances, make it a requirement to create a system for disclosing and efficiently communicating information on chemicals contained in parts, materials and products through supply chains. In order to enhance the management of chemicals contained in products, Toshiba Group has developed Eco Socce-T*2, a system shared by all Toshiba Group companies designed for the integrated management of the acquisition and communication of information on chemicals contained in products. In March 2010, we connected this system to the cross-industrial JAMP information distribution platform provided by the Joint Article Management Promotion-consortium (JAMP*3) and started distributing information. This platform provides direct access to our suppliers' and customers' databases and enables us to collect and distribute information quickly and efficiently throughout our supply chain.

*1 REACH: Registration, Evaluation, Authorization and Restriction of Chemicals
*2 Eco Socce-T: Eco, Substances of concern exchange & management system in the Toshiba group
*3 JAMP: Joint Article Management Promotion-consortium

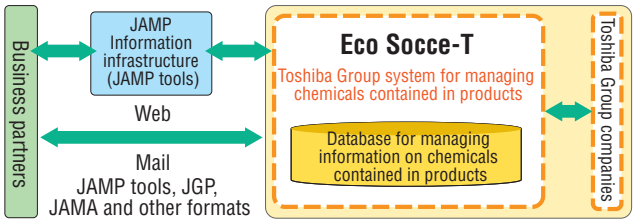
## Compliance with restrictions on the use of prohibited substances by chemical analysis

To ensure the reliability of green procurement and compliance with restrictions on the use of prohibited substances in products, we have established Toshiba Group management standards to be shared among Group companies worldwide for the internal management of prohibited chemicals that have a high risk of being contained in products. Based on these standards, we perform fluorescent X-ray analysis as well as chemical analysis to prevent such prohibited substances from mixing into our products.

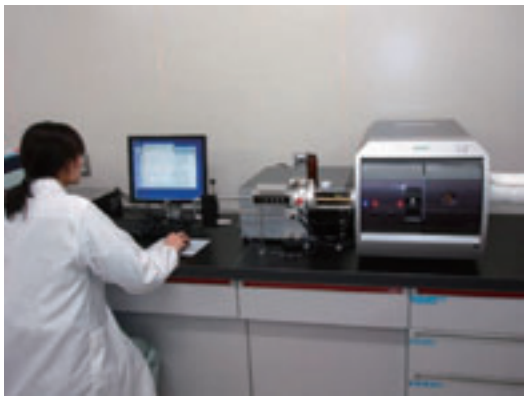
### ■ Management of procured materials




### ■ Compliance with REACH through the use of JAMP tools




### ■ Simple analysis of brominated flame retardants



We have developed an ion attachment mass spectrometry method that measures mass quickly without using an organic solvent; the method is applied to in-house product testing.

## Case Reducing chemicals in notebook PCs

Toshiba Digital Products & Services Company

R series are excellent in low energy consumption exceeding ENERGY STAR criteria by 40% to 50%. They are also leading PCs in minimizing chemical substances and are mercury-free and PVC-free.

**● Mercury-free PCs**
Mercury is eliminated by using LED for LCD backlights.

**● PVC-free PCs**
PVC is not used in the PC main body including internal cables, chassis and printed circuit boards.

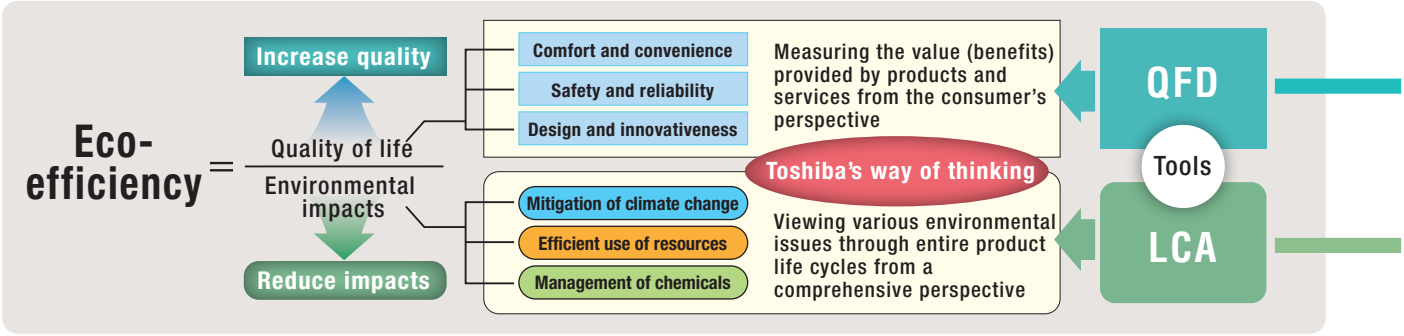
**● Mercury-/cadmium-/lead-free batteries**
Neither mercury, cadmium nor lead is used in the batteries. They fulfill and exceed the criteria of EU Battery Directive and thus labeling of hazardous chemical substance names is exempted.


Portégé R830 TECRA R840 TECRA R850

# Product Eco-efficiency

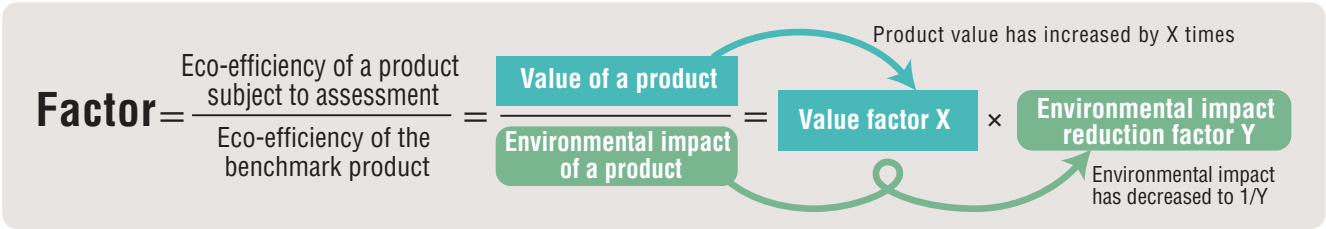
## Eco-efficiency

In order to achieve the goal established in the Toshiba Group Environmental Vision 2050 and create a world with all people leading rich lifestyles in harmony with the Earth, it is essential to improve the eco-efficiency of products and services. Eco-efficiency can be improved by raising the quality of life and by minimizing the environmental impact of products throughout their life cycles. At Toshiba, we use a unique method to measure eco-efficiency in order to create ECPs with high eco-efficiency.




## Factor

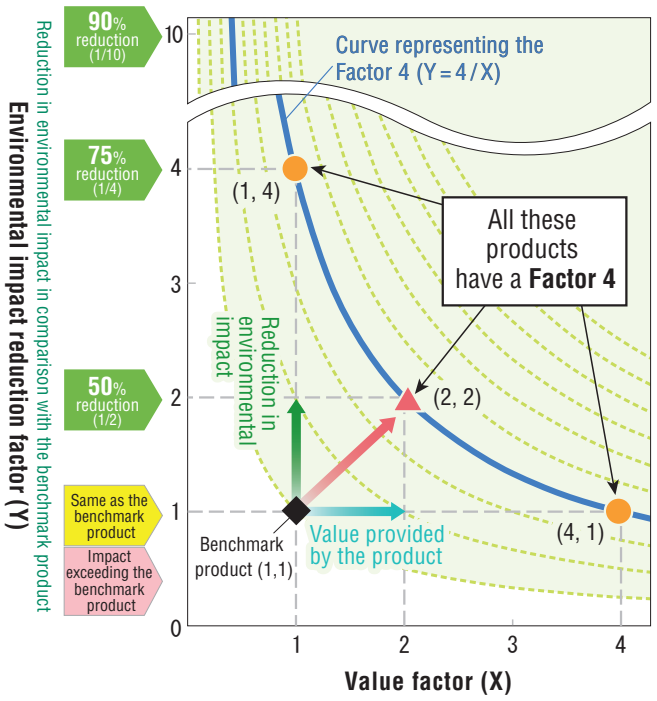
The Factor indicates how many times larger the eco-efficiency of a product is in comparison with a standard. A greater Factor means that a product contributes more to the creation of a world with all people leading rich lifestyles in harmony with the Earth through technological progress and innovation.
The Factor is composed of a numerator and a denominator, which represent different aspects of improvement in eco-efficiency. The numerator, which is called the value factor, represents an increase in the value provided by a product, while the denominator, which is called the environmental impact reduction factor, represents a reduction in environmental impact. The Factor is calculated by multiplying these two components.




### Explanation about the Factor

Example of a product with a Factor 4

The Factor of a product can be plotted in a graph, as shown in the figure on the right, by combining its values on the x-axis (value factor) and the y-axis (environmental impact reduction factor). For example, a product with value twice that of the benchmark product and with environmental impact reduced to one half is represented by the point (2, 2) (marked with a triangle). The benchmark product is represented by the point (1, 1) (marked with a square).
All combinations that are on the curve shown in the figure on the right have a Factor 4 (e.g., points represented by a circle). The Factor, for which values are calculated by multiplying values on the x- and y-axes, generally gives high scores to combinations that strike a good balance between values on the two axes.
For example, the point (2, 2), which is represented by a triangle and has the same value on the x- and y-axes, is located at the shortest distance from the point (1,1) (represented by a square), providing the shortest way to the Factor 4. However, products vary in the level of improvement represented by the x- and y-axes and some products deliver excellent performance only in one of these aspects. Toshiba Group checks to ensure that steady progress is made in reducing environmental impact and increasing the value provided by products by visualizing the progress in a graph on the right. The Factor is also used to provide guidelines for making further improvements.
The Factor of Toshiba Group's products are presented on the following website: http://www.toshiba.co.jp/env/en/products/ecp.htm



# Example of calculation of the Factor of an LCD TV

Product certified as an Excellent ECP in FY2010

REGZA 55F1 (August 2010)
Benchmark product: 55L4000-equivalent

Factor **9.07** = 3.96 × 2.29

## Assessment of the product value with QFD*1

Toshiba Group uses the quality function deployment (QFD) approach to measure the integrated value of products.

**Step 1** Analysis of customer needs

We conduct questionnaire surveys on benefits obtained from the functions and performance of products to study customers' needs.

**Step 2** Visualization of customer's needs and product specifications

Based on the relationship between customers' needs and product specifications (quality characteristics) and by using QFD, we identify quality characteristics required to meet customers' needs.

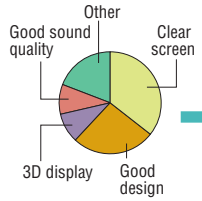
**Step 3** Comparison of specifications

We evaluate the performance of the product to be assessed by comparing it with the benchmark product.

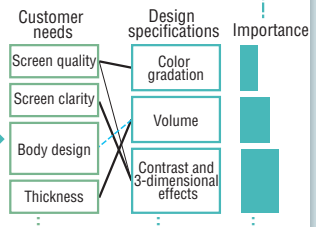
**Step 4** Integration

After comparing specifications and normalizing assessment scores, we adjust the scores with weights and integrate them into a single indicator.

**Value factor 3.96**

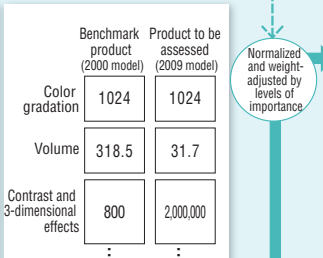



Customer needs based on marketing research




Design specs related to customer needs

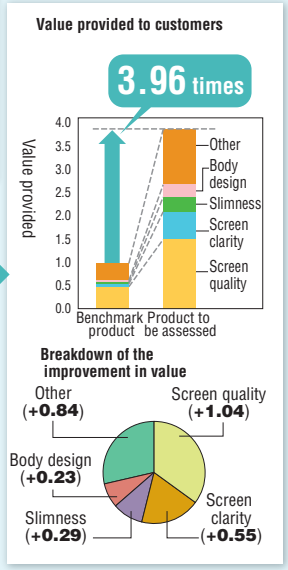
Level of importance based on customer needs




Specs comparison

Normalized and weight-adjusted by levels of importance

**Single indicator (normalized)**




## Environmental impact assessed based on the LIME*2 approach

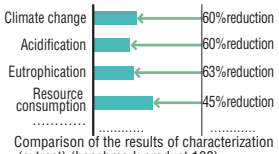
By using the LIME* approach to calculate weights for different environmental issues, Toshiba Group measures not only the performance of products regarding individual environmental issues but also their overall environmental impact.

**Step 1** Life cycle inventory analysis

Using life cycle assessment tools (Easy-LCA*3) and other methods, we calculate the levels of environmental impact of products throughout their life cycles. Easy-LCA provides databases using input-output tables and makes it possible to make life cycle assessments of all products.

**Step 2** Characterization

The levels of environmental impact calculated in step 1 are used to measure environmental effects.



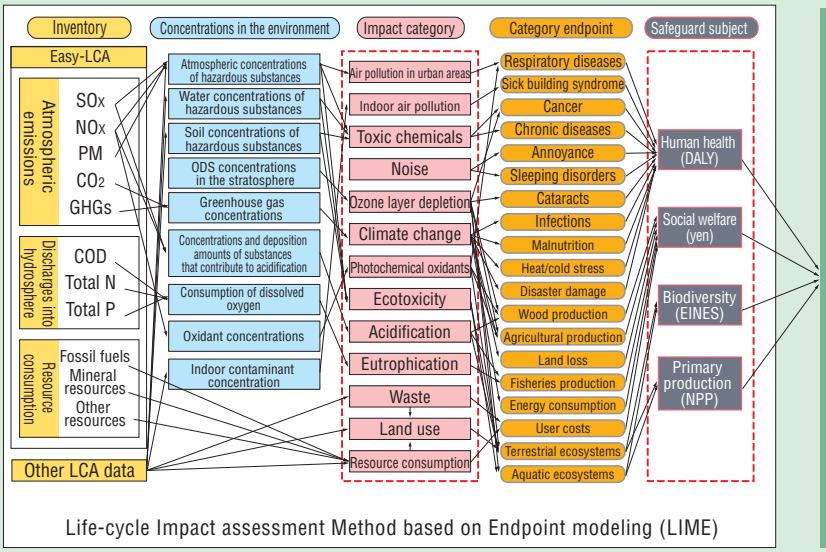

**Step 3** Impact assessment

We measure the level of negative environmental impact by the degree of environmental damage to four targets for protection.

**Step 4** Integration

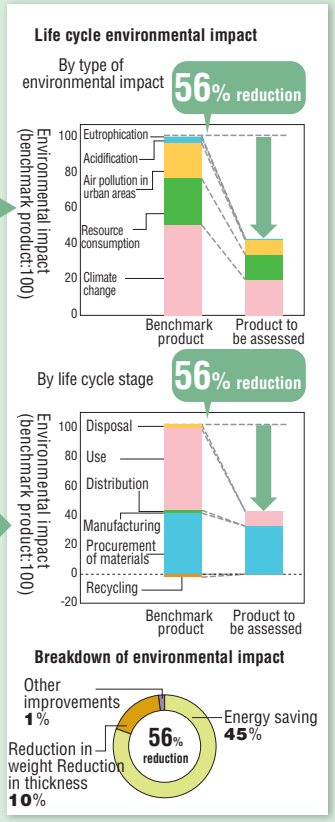
We integrate different measurements into a single indicator by determining weights for the four targets for protection and by using an economic value analysis method known as the conjoint analysis method.

**Environmental impact reduction factor 2.29**




Life-cycle Impact assessment Method based on Endpoint modeling (LIME)

**Single indicator (yen)**




*1 A general tool used in product design.
*2 LIME is a leading scientific and statistical life-cycle impact assessment method in Japan developed by the National Institute of Advanced Industrial Science and Technology (AIST) through LCA projects. The LIME chart presented above is the LIME summary chart provided by the AIST with some additions.
*3 Easy-to-use life cycle assessment tool developed by Toshiba

# Greening by Technology

## Energy and Environmental Technology

# We will contribute to providing a stable supply of power and mitigating climate change through its low-carbon energy technologies.

### Summary of activities in FY2010



## Toshiba Group Energy Initiatives

To achieve the goals of Environmental Vision 2050, Toshiba Group is promoting initiatives aimed at providing a stable power supply and mitigating climate change through its low-carbon energy technologies.

In order to contribute to mitigating climate change through the use of renewable energy, we are also working to develop and promote various power generation technologies, including photovoltaic, hydroelectric, geothermal and wind power generation technologies.

In the area of photovoltaic power generation, we provide power conditioners (500 kW) which feature one of the best power conversion efficiencies in the world (97.7%) and solar modules optimized to allow for the construction of mega solar systems worldwide. We are simultaneously working to promote photovoltaic power generation through the use of distributed power sources in residential solar photovoltaic power generation systems.

As for hydroelectric and geothermal power generation, based on our experience in developing technologies and delivering products, we will expand the supply of high-efficiency power generation devices to emerging countries, where demand for energy is growing, in order to provide the renewable energy best suited to local communities.

With respect to conventional energy, Toshiba Group is continuing to develop thermal and nuclear power generation technologies. At present, about 80% of the world's energy supply depends on fossil fuels. Thermal power generation, which releases $CO_2$ during combustion, emits a greater amount of $CO_2$ than other power generation methods. There is, therefore, a need to strengthen measures to mitigate climate change by using the most advanced technologies. Among fossil fuels, coal has a relatively high reserves-to-production ratio, and coal-fired thermal power generation is likely to continue to be introduced in many Asian countries for economic reasons as well. Thus, to mitigate climate change, high-efficiency power generation facilities are essential. Toshiba Group aims to develop cutting-edge, ultra-supercritical coal-fired thermal power plants around the world as well as to further increase such plants' power generation efficiency. Meanwhile, in the area of gas-fired thermal power generation, we will promote the installation of combined-cycle power generation facilities, which use state-of-the-art, high-efficiency gas turbines in combination with high-performance steam turbines and generators. In addition, we are also developing technologies aimed at commercializing carbon dioxide capture and storage (CCS) systems that separate the $CO_2$ contained in exhaust gases, thereby promoting the development of next-generation

thermal power generation technologies across the entire range of power plant facilities.
Nuclear power is a conventional energy source that does not emit $CO_2$ during power generation. Toshiba Group has been engaged in the construction of 112 nuclear power plants in ten countries around the world. We are currently doing all that we can to stabilize the Fukushima-Daiichi Nuclear Power Plant in cooperation with Westinghouse, a Toshiba Group company, and other partner companies overseas.
We will focus our efforts on developing both urgent and long-term measures to ensure the safety of existing nuclear power plants while simultaneously promoting the development of next-generation nuclear reactors that will provide greater safety.
Regarding power distribution, including the supply of power from power plants, we are developing smart-grid technologies designed to make effective use of renewable energy and to ensure a stable power supply. In order to provide comprehensive energy solutions, in addition to participating in various verification test projects, we have also established a research building at the Toshiba Fuchu Complex to conduct smart-grid experiments. We will further promote the development of smart-grid technologies and contribute to the realization of future smart communities, which involve water, gas and transportation infrastructure.

## Toward a Low-carbon Society

To promote international and domestic development to realize smart grids and smart communities as well as to make technological contributions, industry, government and academia must collaborate to take initiatives no single institution can implement alone, such as the establishment of new standards.
As a member of the Japan Smart Community Alliance*1 established in April 2010, Toshiba Group will promote various cross-company initiatives aimed at realizing a low-carbon society, including verification test projects for the establishment of basic smart grid technologies*2, participation in the HEMS Alliance*3 and smart community verification test projects in countries around the world (for details, see P52) and collaborative research and development with Tsinghua University in China on energy and environmental technologies.

*1 A government-industry joint council established in April 2010 with the participation of various companies from relevant industries, including the electricity, electronics, and automobile industries supported by the Ministry of Economy, Trade and Industry (METI) in Japan and the New Energy and Industrial Technology Development Organization (NEDO). (Norio Sasaki, President of Toshiba Corporation, was appointed as the first chairperson.)

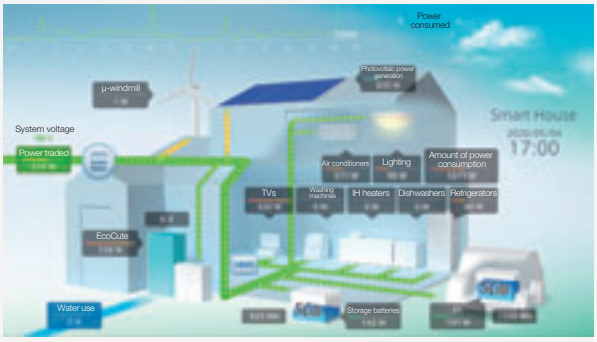
*2 The Next-generation Power Distribution Network Optimum Control Technology Verification Test Project was conducted with the participation of 28 institutions, including the University of Tokyo.

*3 A joint council aimed at establishing a market for HEMS (Home Energy Management Systems) and promoting their use to realize efficient home energy utilization.

## A Smart Grid Research Building at the Toshiba Fuchu Complex

In November 2010, Toshiba established a research building at its Fuchu Complex in order to conduct experiments on smart grids. The building is equipped with experimental facilities to evaluate both supply and demand of power. These facilities enable experiments to be conducted by creating power supply systems that connect multiple power sources via a distribution network to an experimental unit equivalent to a 300-home residential district, even enabling the inside of individual buildings and homes to be simulated. Experiments can be conducted under different conditions by changing the amount of power generated from renewable energy sources or the amount of power consumed in homes and buildings, thereby allowing us to assess the performance of the micro Energy Management System (μEMS), which provides the key to smart grids, as well as to verify the effects of saving energy and reducing $CO_2$ emissions achievable through smart grid introductions.


The status of experiments is displayed in real time on the monitors in the research building. In experiments on power supply networks connecting multiple districts, the status of power supply control depending on the amount of power consumed per district can be confirmed on the monitors.




Equipment in the research building enables users to make assessments by using actual electrical home appliances. This makes it possible to verify the power consumption per appliance as well as the state of solar power generation in real time in order to demonstrate the efficient use of electricity.

# Renewable Energy

## Photovoltaic Power Generation

Toshiba Group will contribute to reducing $CO_2$ emissions by providing photovoltaic power generation systems that achieve high levels of efficiency and long-term stability to a wide range of facilities, including power plants, factories and homes.

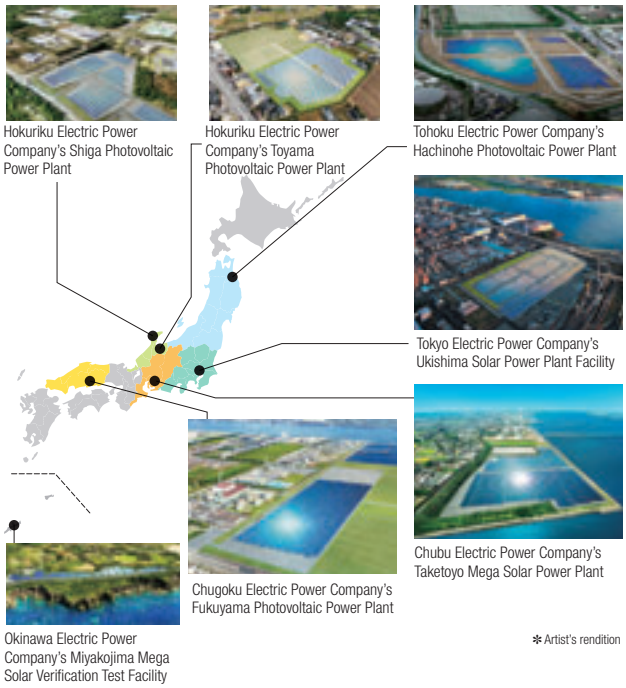
### Mega Solar System Made Possible by Total Engineering

As more and more countries across the world show an interest in climate change, photovoltaic power generation, which uses clean solar energy and produces electricity without emitting $CO_2$, attracts more attention as an efficient means of mitigating climate change. Plans to develop large-scale commercial and industrial systems for photovoltaic power generation have been announced both in Japan and overseas, and the size of the market for photovoltaic power generation is expected to continue to increase in the future.

In January 2009, Toshiba Group established a headquarters for the photovoltaic power generation system business in order to enhance its organizational structure. By using its comprehensive engineering skills acquired through the development of large-scale plants, Toshiba Group offers a full range of services, from installing solar battery modules to establishing connection to power supply networks, by total engineering that includes analysis, design and construction in order to provide mega solar systems that achieve the highest levels of efficiency and long-term stability.

A photovoltaic power generation system needs to convert DC electricity generated by sunlight into AC electricity. Therefore, it is of crucial importance to create an efficient system designed to minimize conversion loss. Toshiba provides a power conditioning system (for use in Japan; rated as having an output capacity of 500 kW) that achieves the industry's highest level of efficiency*, 97.7% (when used at 50% of its rated capacity), thereby improving power conversion efficiency.

* According to our internal data as of June 2011




* Artist's rendition

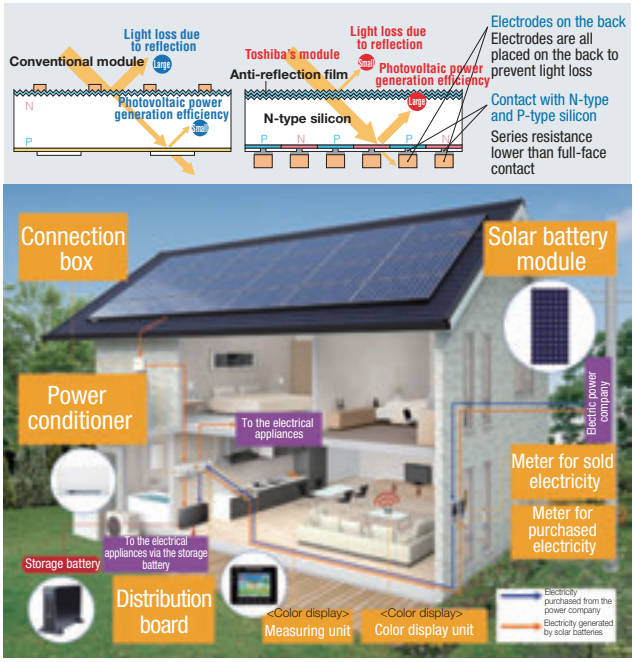
**Mega Solar Systems for Electric Power Companies**

We are striving to develop and commercialize high-efficiency power generation systems by using our skills in building solar battery modules in combination with related systems in accordance with purposes and usage environments. We also design an optimal layout of a large number of solar battery modules by analyzing various factors, including wind conditions during the installation of solar battery modules, the design of the base framework for solar panels, construction plans, transportation systems and construction methods, in order to minimize the construction costs of mega solar systems. In August 2009, Toshiba Corp. concluded a contract for the development of Chubu Electric Power Company's Taketoyo Mega Solar Power Plant. Including this contract, as of November 2010 we have seven contracts with electric power companies for mega solar systems (total output capacity approximately 25 MW). We have also delivered photovoltaic power generation equipment to more than 100 public and industrial facilities, thereby contributing to reducing $CO_2$ emissions through our promotion of photovoltaic power for power supply and industrial use.

### High Efficiency Solar Panels for Homes

Toshiba Corp. entered the residential solar photovoltaic power generation system business in April 2010. Since the release of its first model, Toshiba's solar battery modules for homes have increased module conversion efficiency to the highest level in the industry* (16.9%) by taking in sunlight efficiently even when placed on Japanese houses' small roofs and by maximizing power generation output. While conventional solar battery modules have electrodes on the cell surface, Toshiba adopted a back-contact method and placed all electrodes on the back of a panel so as to reduce the loss of light caused by reflection and to improve power generation efficiency. Toshiba's solar battery modules, which do not have electrodes on their surface, are also designed to be slim and have a sophisticated appearance. To expand our product lineup, we have also released a photovoltaic power generation system with storage batteries intended for new houses. We will further promote photovoltaic power generation with solar battery modules designed with even better conversion efficiency.

* According to our internal data as of June 2011



# Hydroelectric Power Generation

Hydroelectric power generation, which produces electricity without $CO_2$ emissions by using the gravitational force of falling water, provides clean and renewable energy, the effective utilization of which is being reviewed by countries around the world.

## Provide a Stable Supply of Clean Energy

Among power generation systems that use clean and renewable energy without $CO_2$ emissions, hydroelectric power generation is the most efficient in providing a stable power supply at low power generation costs. Since 1894, when we delivered a generator to the first commercial hydroelectric power plant in Japan, Toshiba Group has delivered approx. 2,000 hydro-electric turbines and generators respectively, with a capacity of 54 GW or more to over 40 countries around the world.

## Contribution to Power System Stabilization by World's Top Class Pumped Storage System Technology

Installation of the pump turbine runner for Unit No. 2 at the Tokyo Electric Power Company's Kannagawa Power Plant

Pumped storage power generation systems generate power by pumping water at night and by flowing water during the day when power demand peaks. Pumped storage power generation systems that store electricity play an important role in effectively using electricity. Toshiba Group has the world's top class technology and experiences in this area. At present, in addition to the renovation of the Lundington Pumped Storage Power Plant, U.S., which features the world's largest diameter pump turbine runner, we are also engaged in the construction of one of the world's largest-capacity pump turbines, the Kannagawa Power Plant, unit No. 2. Among the pumped storage power generation systems, adjustable-speed pumped storage systems, which can change the amount of electricity used while pumping by changing rotation speed, can serve to adjust system frequency. For this reason, these systems are attracting widespread attention as more and more renewable energy is introduced by wind and photovoltaic power generation. As the pioneer that built the world's first versions of this, Toshiba Group is constructing the Kyogoku Power Plant (Japan) with the aim of providing a stable supply of environmentally conscious energy.

## Global Business Expansion Based on Wide Technological Development

Hydroelectric power generation requires that equipment be designed in accordance with different geological conditions. Toshiba Group is working to develop a wide range of technologies, including developing various types of machines, improving power generation efficiency and output capacity, and increasing product life, in order to provide countries worldwide with hydroelectric power generation systems that can achieve high performance with low environmental impact. In our renovation projects, we have successfully realized efficiency upgrade by adopting a new blade shape for our turbine runners that we developed by using the most advanced fluid analysis technology. In new construction projects in China and emerging countries, large diameter generators have been put into commercial operation, and Toshiba Group is taking an active part in constructing these new facilities as well as renovating existing ones both in Japan and overseas.

Installation of a generator rotor for the Shenxigou Power Plant in China

## Micro-hydroelectric Power Generation Systems

Unlike large-scale hydroelectric power generation, micro-hydroelectric power generation makes effective use of small water resources to generate electricity. Toshiba Group has developed and commercialized Hydro-eKIDS™, a micro-hydroelectric power generation system designed for customers that are not using water for power generation. Unlike conventional hydroelectric power generation systems, Hydro-eKIDS™ does not require large-scale civil engineering or construction and can be used anywhere there are water sources available, including water supply and disposal systems, irrigation canals, wastewater from factories and water discharges from rivers, thereby contributing to reducing greenhouse gas emissions and saving energy.

Hydroelectric power generation equipment for sewage treatment plants (Hydro-eKIDS™ type L)

# Wind Power Generation

Wind power generation is attracting widespread attention as a method of power generation that provides clean energy without emitting $CO_2$ by converting natural wind energy into electricity.

## Using Wind Energy to Generate Electricity without Emitting $CO_2$

Wind power generation uses power generators to convert the rotational energy generated by windmill blades into electric energy. As wind power generation produces renewable, clean energy without emitting $CO_2$, it is attracting attention in countries around the world. There is likely to be a rapid increase in demand for wind power in the future. Based on this global trend, Toshiba Corp. will take an active part in promoting the use of wind power generation systems as environmentally conscious energy sources both in Japan and overseas.

Windmill (750 kW)

# Conventional Energy

## Geothermal and Solar Thermal Power Generation

By utilizing steam turbine and generator technologies developed through its experience in thermal power generation, Toshiba Group is also working to develop applications for renewable energy use, including geothermal and solar thermal power generation.

### Applying Steam Turbine and Generator Technologies to Make Maximal Use of Renewable Energy

Toshiba Group provides geothermal power generation facilities and promotes geothermal power generation through the construction of new geothermal power plants, by using the most advanced technologies designed to improve facility performance and reliability, developed through our experience in thermal power generation with steam turbines and generators. We also apply our most advanced technologies to renovate steam turbines in existing power plants, thereby providing long-term stable power generation and contributing to reducing $CO_2$ emissions.

Geothermal power generation systems, which produce electricity by extracting hot water and steam from underground and by rotating steam turbines using the energy of the extracted hot water and steam, cause a very low level of $CO_2$ emissions—about 1.5% of $CO_2$ emissions generated by coal-fired thermal power generation (comparison on a life cycle basis). As geothermal power generation uses the stable thermal energy of the earth's magma, unlike other renewable energy sources, it can uniquely provide a stable supply of power regardless of seasonal changes or weather conditions.

### As a Leading Company in Geothermal Power Generation

Since delivering turbines and generators to Japan's first commercial geothermal power plant in 1966, Toshiba Group has delivered geothermal power generation facilities to various countries around the world, including the U.S., the Philippines, Iceland and Mexico. We have also received an order for two 83-MW facilities featuring geothermal turbines and generators from New Zealand-based Contact Energy. Our current geothermal global market share is approximately 25% of the cummulative installed capacity.

We have already delivered ten high-performance, high-reliability steam turbine rotors for the renovation of systems at the Geysers Power Plant in the U.S., which has the world's largest geothermal power generation capacity. These turbines improved steam consumption efficiency by approximately 10%, demonstrating their high level of performance. Unit 11, delivered in 2002, has operated until 2010—a period of eight years—without any maintenance, such as opening the turbine casing. And further it showed almost no decline in performance, proving its high reliability.

In order to make maximal use of renewable energy, Toshiba Group is also working to apply its technologies developed for steam turbines and generators to develop solar thermal power generation systems. Toshiba Group will continue to promote geothermal and solar thermal power generation by using our high-performance, high-reliability technologies, thereby contributing to reducing $CO_2$ emissions.

## Thermal Power Generation

Toshiba Group is working to develop various technologies designed to achieve zero $CO_2$ emission thermal power generation. We will also help ensure a stable power supply by supporting the recoveries of earthquake-affected power plants as part of our post-earthquake restoration efforts.

### Toshiba's Steam Turbine Power Plant Aiming to Realize Zero $CO_2$ Emissions during Operation

At present, thermal power generation accounts for approximately 70% of the total amount of electricity produced around the world. However, thermal power generation causes more $CO_2$ emissions per unit power produced than other power generation methods. In order to reduce $CO_2$ emissions from thermal power generation, Toshiba Group is developing next-generation thermal power technologies aimed at improving power generation efficiency and putting carbon dioxide capture and storage systems (CCS) to practice, which separate and capture $CO_2$ emitted from power plants, to be sequestered from the atmosphere by underground storage or other means.

* CCS .... Carbon dioxide Capture and Storage

### Support for Post-Earthquake Restoration

To support the quick recovery of thermal power plants, substations, switching stations and other power supply facilities affected by the March 11, 2011 Great East Japan Earthquake as well as to help restart the operation of thermal power plants currently under periodic inspection, Toshiba Group is making our highest priority the dispatching of engineers, the shortening of delivery time for parts and repaired products and the provision of assistance to reopen the thermal power plants now out of service.

In addition, we also cooperated in installing gas turbine power generation facilities to serve as emergency power sources, contributing to the restoration of approximately 10 million kW of electricity for the area covered by the Tokyo and Tohoku Electric Power Companies before the peak period of electricity consumption during the summer of 2011. We will continue our efforts to further increase the supply of power by two million kW for 2012 by restoring earthquake-affected power plants and by constructing new plants.

### Towards Practical Application of Carbon Capture Technology

Toshiba Corp. is working to bring carbon dioxide capture and storage (CCS) technology on board as an effective means of eliminating the $CO_2$ emitted from thermal power plants. In order to verify the performance and operability of the post-combustion capture solvent system developed by Toshiba under actual thermal power plant conditions, pilot plant has been constructed in September of 2009. We have conducted more than 5000 hours of verification tests to date, continuously improving system performance, as well as gaining insight on how to apply and integrate this technology to actual power plants.

CCS pilot plant (within the Sigma Power Ariake Mikawa Power Plant in Omuta City, Fukuoka)

# Nuclear Power Generation

To assist in providing a stable supply of energy and mitigating climate change, Toshiba Group will contribute to reducing $CO_2$ emissions through the provision of truly safe and secure nuclear power generation.

## Contributing to a Stable Energy Supply and the Mitigation of Climate Change

The global primary energy demand is predicted to increase to about 1.3 times the current level by 2030.*1 At present, we depend on fossil fuels for about 80% of our energy supplies. Meanwhile, the use of fossil fuels presents serious problems, including climate change and resource depletion, making it more and more difficult to depend on these sources for our energy supplies. Although solar power and wind power are expected as sources of clean energy, they are unlikely to become conventional energy sources because of their economic performance and supply stability.

Nuclear power generation is capable of producing a large amount of energy without emitting $CO_2$ during operation. While it is estimated that fossil fuels will only be available for about 100 more years, uranium, which is a reprocessable nuclear fuel, is estimated to be available for use as energy for as long as 3,000 years.*2 By building a 1.35 GW nuclear power plant instead of a conventional coal-fired thermal power plant and by operating the plant at 80% of capacity, we will be able to achieve an annual reduction of as much as 9 million tons of $CO_2$.*3 Toshiba Group has been engaged in the construction of 112 nuclear power plants in ten countries around the world, thereby contributing greatly to reducing $CO_2$ emissions.

## Support for Post-Earthquake Restoration

Efforts are still underway to stabilize the Fukushima-Daiichi Nuclear Power Plant which was seriously damaged by the March 11, 2011 Great East Japan Earthquake. Toshiba Corp. established an emergency task force immediately after the earthquake and company employees have been united in their efforts to bring all available knowledge, including technologies from Westinghouse and other overseas companies, to stabilize the plant as soon as possible. In order to minimize the release of radioactive materials and reduce the radiation dose rate around the plant, we are implementing various measures, including treating contaminated water and working to stabilize the nuclear reactors and spent fuel pools at low temperatures. We are also providing various measurement and automation technologies, including robots, to reduce the load of those working toward restoration.

To formulate a comprehensive management plan, Toshiba Corp. also held discussions regarding post-earthquake restoration with four U.S. companies that worked on the recovery after the Three Mile Island accident before submitting our plan to the Tokyo Electric Power Company. Our plan aims to transform the current plant site into a green field in ten years (earliest possible estimate) by using available technologies to decommission the nuclear power plants. We will continue to make follow-up proposals and to develop the technologies required to implement such proposals.

Multi-function robot developed for the Fukushima-Daiichi Nuclear Power Plant

Transforming the site into a green field

## Safety Standards for the Future

As stated earlier, we believe that nuclear power generation is necessary to ensure a stable power supply to meet growing demands for electricity. We also believe that there will continue to be demand for nuclear power generation worldwide even after the earthquake. In China, Westinghouse has concluded a contract for building four advanced pressurized water reactors (AP1000™) and is currently constructing these reactors. We have also concluded a contract for building six AP1000™ reactors in the U.S. and are now constructing four of those reactors. In the U.S., we also concluded a contract for building two advanced boiling water reactors (ABWR) and are working to obtain the permissions required for construction. In Japan, we are participating in the construction of Electric Power Development Co., Ltd.'s Ohma Nuclear Power Plant.

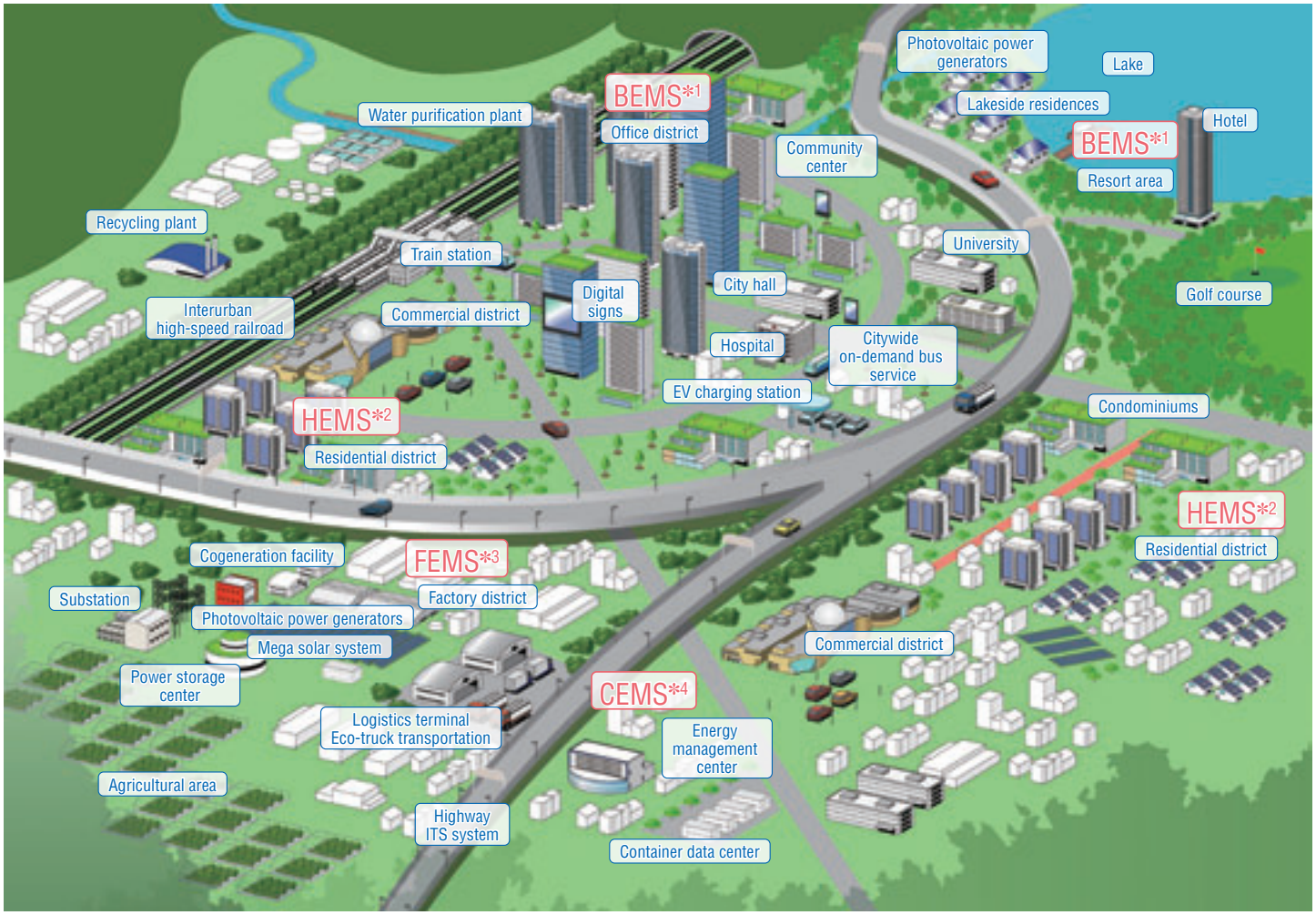
We will take an active part in international safety assessments made based on the lessons learned from the accident at the Fukushima-Daiichi Nuclear Power Plant as well as from reviews of safety standards conducted to minimize the number of severe accidents caused by external events. We will reflect these standards in our designs for new plants and renovate plans for operating plants to continue our efforts toward the highest levels of safety performance.

Construction of the Sanmen Nuclear Power Station in Zhejiang Province, China

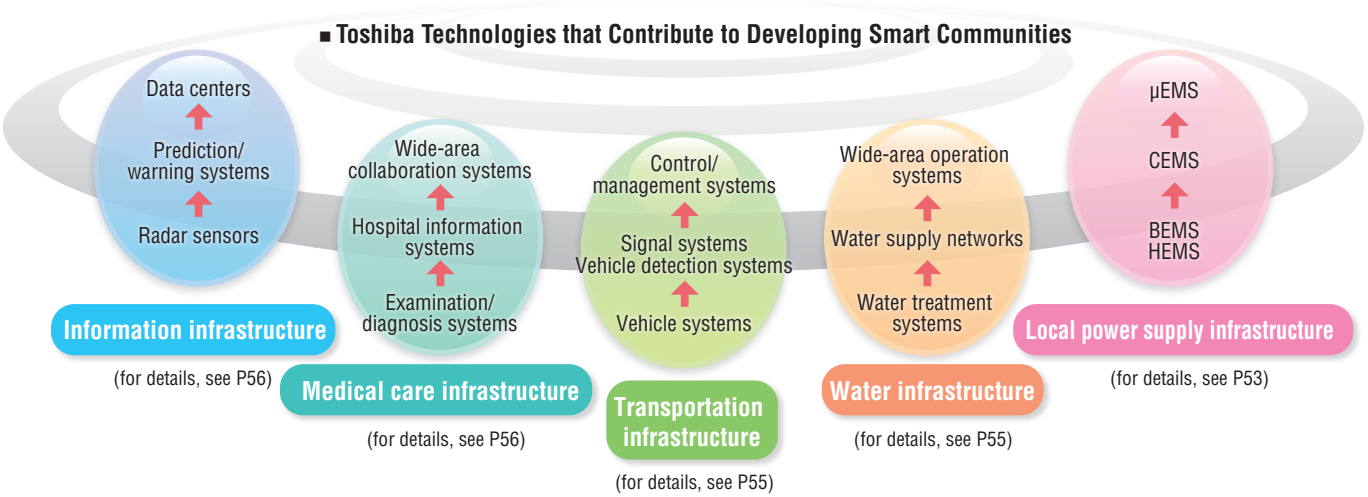
*1 Source: World Energy Outlook 2010
*2 Source: Graphical Flip-chart of Nuclear & Energy Related Topics 2011, Japan Atomic Energy Relations Organization
*3 Calculated based on a comparison of $CO_2$ emissions from coal-fired thermal power generation and from nuclear power generation. Source: Graphical Flip-chart of Nuclear & Energy Related Topics 2011, Japan Atomic Energy Relations Organization

# Realizing a Low-Carbon Society through Smart Communities

A smart community is a system for next-generation communities that integrates management and optimizes control over all infrastructure, including power, water, transportation, logistics, medical care as well as information networks. Smart communities use the power supply network to connect multiple distributed power sources, such as photovoltaic and wind power generation facilities with rechargeable batteries which store electricity, and collect information on energy consumption in homes, offices, factories and commercial facilities via the telecommunications network. These networks enable real-time analysis and predictions on energy demand, thereby empowering consumers to make efficient use of their electricity as well as allowing the network operators to provide them with various services. By networking the water supply, transportation and logistics, the smart community system controls the balance of supply and demand, thereby creating new services and promoting the effective use of energy and resources, resulting in comfort and convenience. To contribute to the realization of a low-carbon society, Toshiba Group aims to create next-generation smart communities.




## ■ Toshiba Technologies that Contribute to Developing Smart Communities

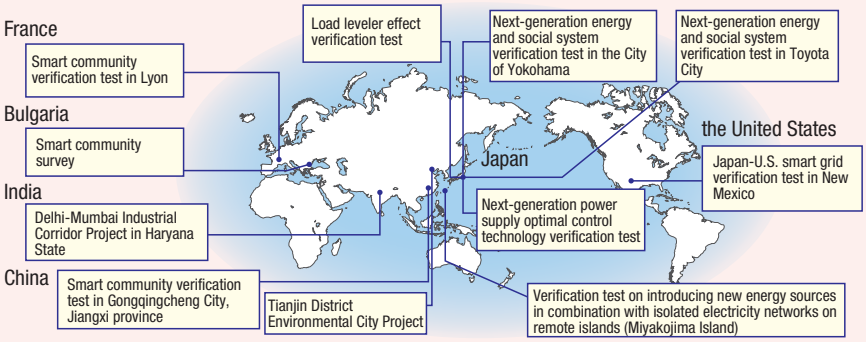



*1 BEMS: Building Energy Management System
*2 HEMS: Home Energy Management System
*3 FEMS: Factory Energy Management System
*4 CEMS: Community Energy Management System

TOPICS

# Participation in Smart Community Verification Test Projects

Smart communities are being designed in countries around the world in accordance with differing local conditions and needs. Toshiba Group is participating in various types of verification test projects.



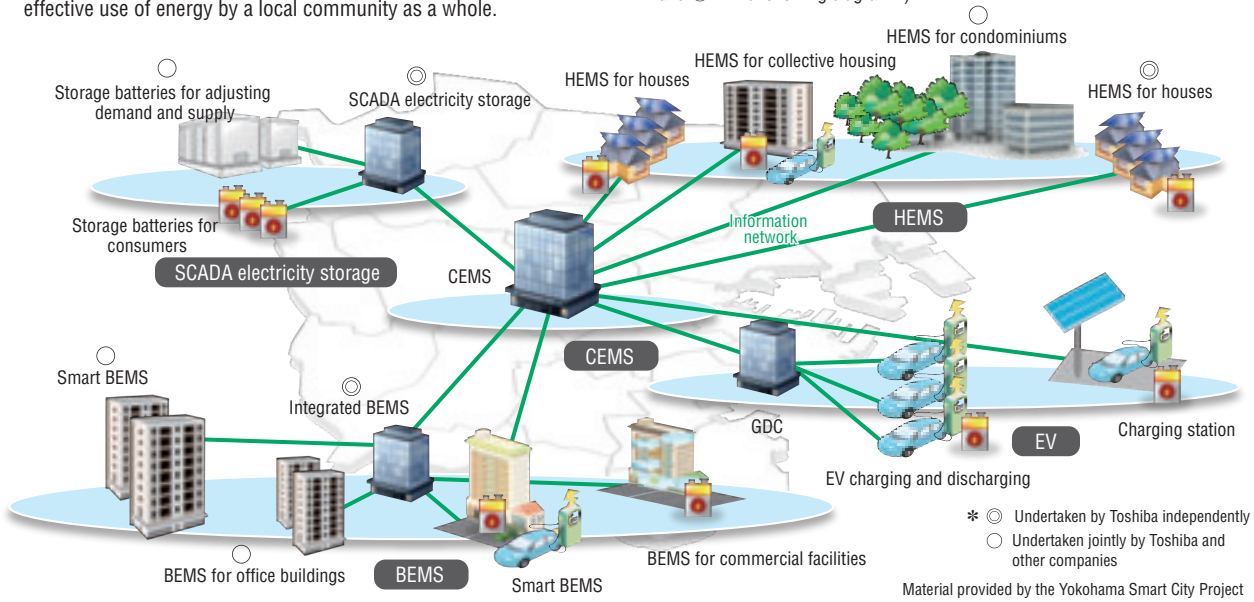

## Verification Test in the City of Yokohama, Japan

**The Yokohama Smart City Project:**
**The Ministry of Economy, Trade and Industry's (METI's) next-generation energy and social system verification test project**

The purpose of the City of Yokohama Project is to prevent global warming and break away from dependence on fossil fuels to reduce $CO_2$ emissions, a necessity in the 21st century. To this end, the project aims to allow for comfortable and environmentally conscious lifestyles to be established and to create a system that facilitates the effective use of energy by a local community as a whole.

In this project, we are conducting demand-response tests by controlling energy demand while introducing photovoltaic power generation systems, storage batteries and electric vehicles in three districts with different characteristics (Minatomirai 21, Kohoku New Town and Yokohama Green Valley). Toshiba is responsible for developing energy management systems for the entire local community (CEMS), buildings (BEMS) and homes (HEMS), as well as conducting verification tests on those systems.

(Programs carried out with the participation of Toshiba are marked with ◎ and ○ in the following diagram.*)




* ◎ Undertaken by Toshiba independently
○ Undertaken jointly by Toshiba and other companies

Material provided by the Yokohama Smart City Project

## Verification Test in Lyon, France

**The New Energy and Industrial Technology Development Organization (NEDO)'s verification test project**

The City of Lyon is often called the second capital of France. In anticipation of energy-saving measures, a massive introduction of renewable energy and the spread of next-generation cars (electric vehicles) in the future, this smart community verification test project is to be conducted in the 150-hectare Confluence redevelopment area that expands from the confluence of the Rhone and Saone Rivers to the Perrache TGV railway station in Lyon.

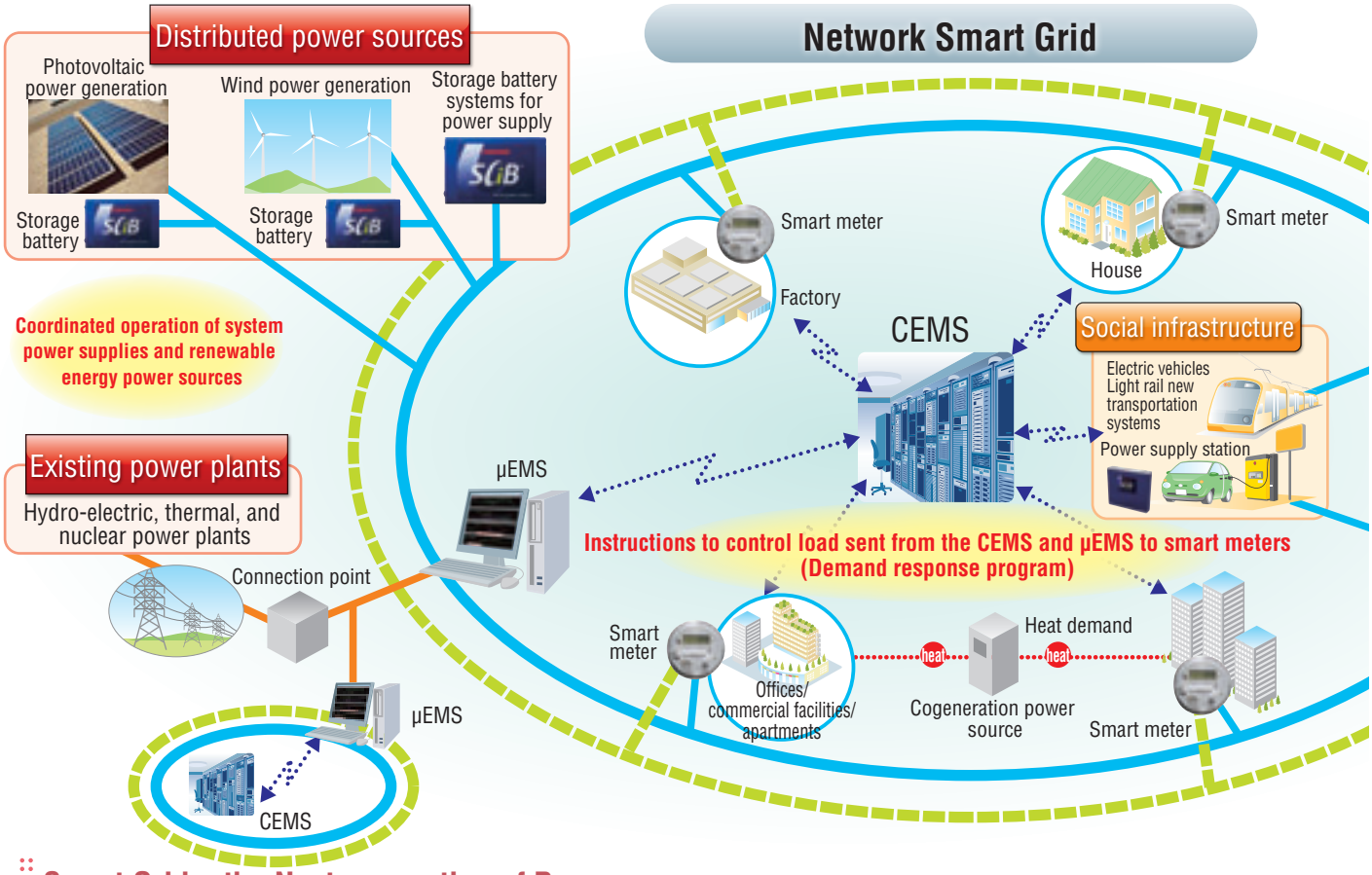
Toshiba is participating in the preliminary survey for this verification test project by operating buildings that use renewable energy and implement energy-saving control systems; introducing a car-sharing system designed to maximize the use of electric vehicles; managing electric charging stations and constructing a system for monitoring energy consumption in homes and buildings.

Source: SPLA Lyon Confluence

# Realizing a Low-Carbon Society through Smart Communities

## Local Electricity Infrastructure

Realizing a low-carbon society requires efficient use of renewable energy as well as a means of conserving energy. Since renewable energy sources such as sunlight and wind are affected by weather conditions, it is particularly important to find an appropriate method of incorporating these energy sources into power supply systems. Consequently, in energy conservation initiatives there is a need to visualize and optimally control energy consumption in homes, buildings and factories. The spread of electric vehicles and charging stations will also greatly affect local energy, rendering it necessary to create a new framework, local electricity infrastructure. Toshiba Group aims to develop a system for next-generation energy designed to optimize the balance between supply and demand, thereby contributing to the realization of a low-carbon society.




## Smart Grids, the Next-generation of Power Supply Networks

The amount of power generated by power generation methods relying on renewable energy sources such as sunlight and wind varies with the weather. Therefore, when renewable energy is introduced in large amounts, the frequency and voltage of power distribution systems will be affected and such fluctuations must be adequately controlled. In the past, by combining functions for predicting energy supply and demand in addition to output control functions realized using storage batteries, Toshiba has created community-wide energy control systems to conduct verification tests. On Miyakojima Island, for example, the Okinawa Electric Power Company has been testing the microgrid system installed by Toshiba for remote islands since the fall of 2010. Toshiba's microgrid system, which adequately controls energy by using stationary storage battery facilities, ensures stable operation of the power supply system on the island, where electricity generated by large-scale photovoltaic and wind power generation facilities is incorporated into a small-scale power supply network by reverse power flow*.

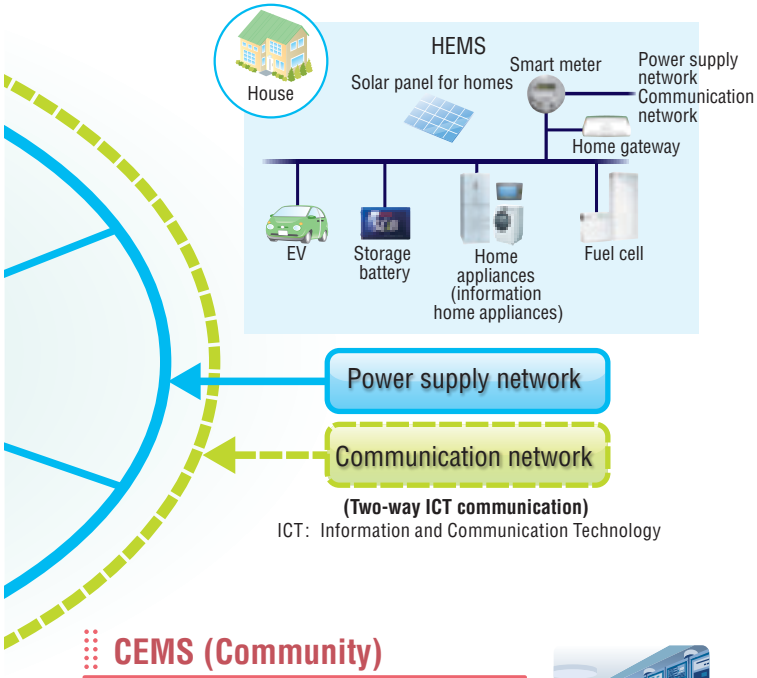
* A flow of auxiliary electricity created by photovoltaic and other power generation systems in the direction opposite the electric flow running through the electric company's power supply network

## μEMS: Grid monitoring/control device

A grid monitoring/control device, the Micro Energy Management System (μEMS) is one of the core technologies that serve as the brain of a smart grid by monitoring and controlling the local supply and demand of electricity.
The μEMS is a system for controlling electricity supply and demand, which is designed to absorb variations in power consumption within a grid and to minimize the effects of these variations on the electricity network. The system performs three functions: formulating comprehensive plans for energy supply and demand; controlling the allocation of economic load; and controlling load frequencies in real time. It is particularly important to predict and control electricity demand when introducing new large-scale transportation systems that feature electric vehicles and other new types of transportation that may change the demand side considerably. In addition to being involved in the verification test project conducted by the New Energy and Industrial Technology Development Organization (NEDO) in cooperation with the state government of New Mexico, the United States, Toshiba has also received a contract for a test verification project to carry out optimum energy control initiatives in Gongqingcheng City of Jiangxi province in China.

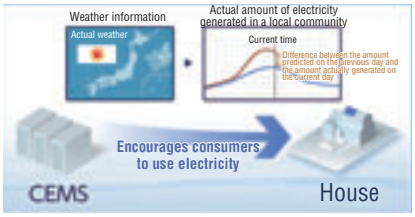
## HEMS, BEMS and FEMS

Toshiba provides commercial systems designed to optimally control energy use in homes, buildings and factories in accordance with the type and size of the facility.
A HEMS connects electrical home appliances, while BEMS and FEMS connect equipment in buildings and factories, respectively, allowing automatic control of energy use which in turn facilitates visualization of the status of electricity consumption and optimal operation of facilities. We will take an active part in developing the most advanced management systems that can be used in combination with smart meters and smart grids while providing products and management services to realize smart communities.




## CEMS (Community)

One of the new functions made possible by smart grids is the capability to adjust energy supply and demand based on demand response, allowing electricity providers to control energy use on the demand side. To this end, a new system that collects information from the energy management systems installed in individual buildings and homes must be created which can adjust supply and demand throughout the entire local community. Such a system may create a need for groups to manage a number of buildings in local communities and to develop systems for energy lending and coordinated energy control. Through efficient demand control based on real-time load data, smart grids will provide options for conserving energy smartly.




Energy lending within a local community (CEMS)

## Smart meter

A smart meter is a high-performance system that collects data on power consumption and transmits the data to power utilities. It is able to collect data of consumption in buildings and houses in realtime, providing the data to power utilities through network. Also users can obtain the information for their power consumption charge. A smart meter is capable of two-way communication. When it receives demand from grid monitoring system to reduce the power demand, a smart meter will control power consumption of connected appliances to be reduced. Toshiba acquired Landis+Gyr AG (headquarters in Switzerland), which has the largest share in the global smart meter market, as a Toshiba Group company in July 2011, and is ready to expand its smart community business globally.

## SCiB™ rechargeable battery

The SCiB™ rechargeable battery is attracting widespread attention as a battery that can be used for a variety of purposes, including power storage, electric automobile and residential storage purposes. In addition to high levels of safety, power storage battery systems require long product lives and high efficiency. To meet these requirements, Toshiba has developed the SCiB™ rechargeable battery, which is designed to guarantee safety and long life. By using the SCiB™ in battery systems, we have achieved the performance level required for power storage.
We have also developed a new automobile battery that can be charged or discharged rapidly, has a long product life and can charge electricity for driving even at low temperatures. Our battery was adopted in the i-MiEV [M] and MINICAB-MiEV, Mitsubishi Motors Corporation's next-generation electric automobiles.

SCiB™ battery module for automobiles

## Fuel Cell System

Fuel Cell System for residential (ENE-FARM) is a micro power plant that supply electricity and heat for home. There are no power transmission losses with the fuel cell system and the heat generated by their chemical reactions can also be used to produce hot water. For those reasons, it is expected to play an important role in reducing residential $CO_2$ emissions and has been installed by an increasing number of consumers since being released in fiscal 2009. Based on our experience and know-how accumulated over the years, Toshiba Group has been developing many products which lead the industry in durability, cost and compactness including dual-fuel system for both natural gas and LPG. We have also recently developed a new model for cold regions which can be installed and used at an external temperature of –20°C as well as new model for natural gas produced in Japan, thereby expanding our product lineup to adapt to diversity of customer's needs.

Residential fuel cell (ENE-FARM)

# Realizing a Low-Carbon Society through Smart Communities

## Water Infrastructure

As water infrastructure requires an enormous amount of energy to operate, saving electricity and reducing energy consumption are highly important. With a view to realizing an environmentally conscious and comfortable community, Toshiba uses advanced control systems and innovative technologies to minimize environmental impact by saving energy and reducing the amount of waste generated, thereby contributing to the creation of a sustainable water circulation system.

### Water Supply and Wastewater Monitoring/Control Systems

To meet the demand of wide area coverage and the reduction of labor and energy, Toshiba has developed the TOSWACS™ series of systems for medium- and large-scale monitoring/control operations and the WATCHING™ series for small-scale operations. These systems enable users to conduct detailed, intensive monitoring of a number of different facilities in remote locations in real time, thereby contributing to efficient facility operation and reductions in management workload.

Monitoring/control system

### Energy-saving Water Treatment System

In wastewater treatment, aeration consumes an enormous amount of electricity. To resolve this difficulty, Toshiba is promoting the development of a wastewater treatment system that does not require aeration. We are conducting test experiments aimed at drastically reducing both power consumption and the amount of sludge produced using a treatment technology employing species of anaerobic bacteria, which do not need oxygen to decompose organic matter.

Pilot plant for the wastewater treatment system without aeration*

### Factory Wastewater Treatment Systems

Factory wastewater sludge is produced mostly as a result of the use of chemicals (coagulants) required in wastewater treatment. Toshiba provides a reusable absorbent (functional powder) and a chemical-free filtration system to minimize the use of such chemicals. This system greatly reduces chemical use and consequently the amount of sludge produced.

Functional powder

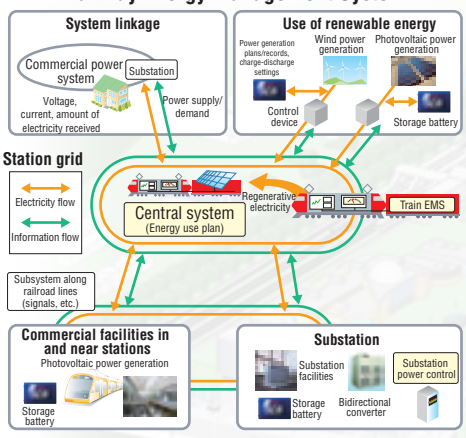
Chemical-free filtration system

* Japan Sewage Works Agency's Research & Technology Development Experiment Center

## Transportation Infrastructure

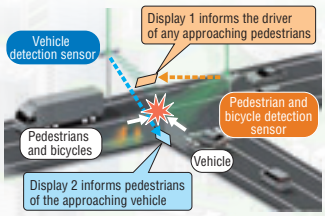
Trains and automobiles are evolving into next-generation electric vehicles which emit less $CO_2$ than their conventional counterparts. Toshiba provides a system for transportation infrastructure designed to link electricity and information through a smart community network. Toshiba's system makes effective use of renewable energy to realize a low-carbon society, thereby contributing to the mitigation of climate change.

### Railway Energy Management System



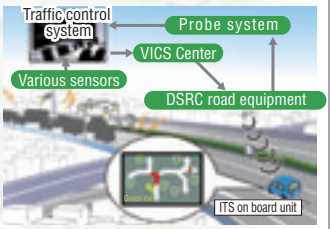

Effective use of natural and regenerative energy to realize a low-carbon society

### Safe Driving Support System




This system processes images to identify pedestrians, bicycles and vehicles and assesses the probability of collisions to provide cautionary information on specialized displays or the screens of car navigation systems supporting the ITS Spot service.

### ITS Spot Service




Provision of wide-area route guidance services and safe driving support information began in the spring of 2011 for car navigation systems supporting the ITS Spot service. Plans are being made to provide further services.

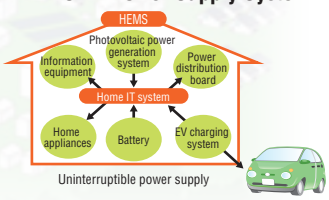
### Environmentally Conscious Railroad System

We have commercialized a hybrid switcher that is powered by the combination of a permanent magnet synchronous motor (PMSM) system, a diesel engine and a storage battery. Compared with conventional locomotives powered by diesel engines, this switcher exhausts approximately 60% less gas and is approximately 20 dB quieter. The efficient engine operation and use of a regenerative brake system also enable greatly reduced $CO_2$ emissions.

### EV/HEV/PHEV Driving System

We provide a comprehensive driving system composed of a high-efficiency motor, a compact high-capacity inverter and a battery that together provide a high level of security and durability. The system can quickly be charged.

### HEMS EV Power Supply System




Discharge and recharge of the EV/PHEV is controlled by the HEMS, allowing the vehicle to be used as an emergency power source.

## Information Infrastructure

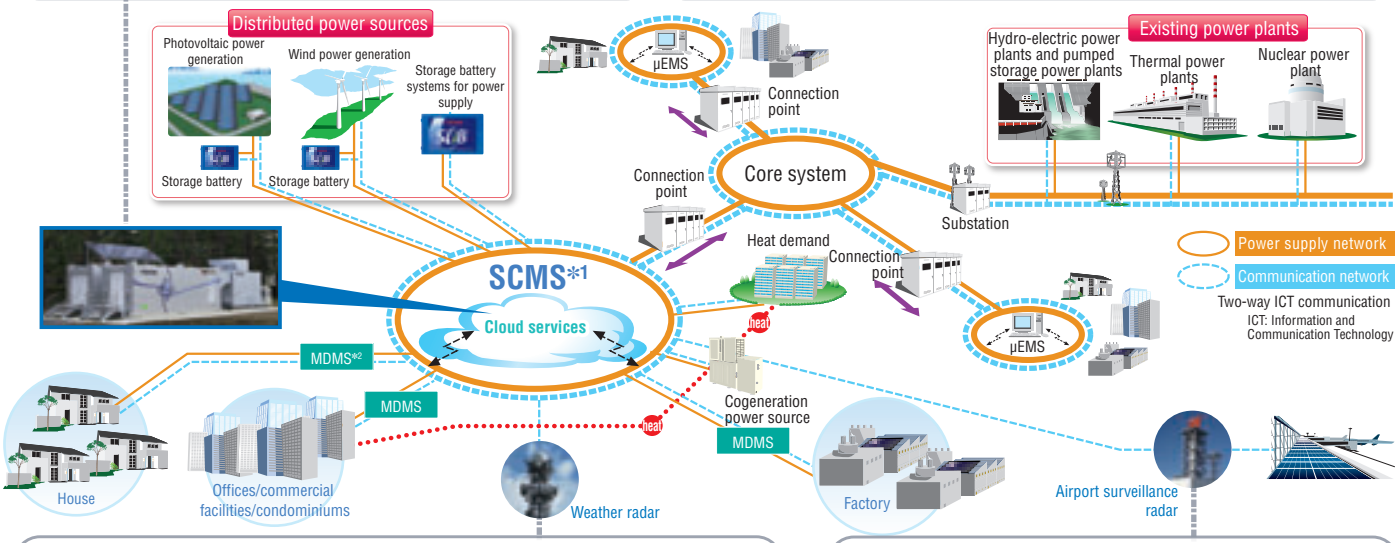
In smart communities, the constant exchange of data necessary for optimally controlling energy and resources as well as data on people, objects and money creates the need to appropriately manage such massive data exchanges. In such communities, various information systems and facilities—including systems that visualize data, weather observation systems required in order to simulate electricity consumption, air traffic control radars that provide traffic solutions and data centers that process massive amounts of information—play important roles in collecting and processing information on the local community as a whole.

### Modular Data Centers

Toshiba has modularized the various pieces of equipment required for data centers, including air conditioners and power sources, thereby eliminating the need to draft design blueprints and construct buildings as is required for conventional data centers. We commercialized our modular data center model, which is designed to save not only energy and space but also to reduce construction time, in April 2011.

### IT Infrastructure for Local Communities and the Smart Community Management System

Toshiba has developed a smart community management system that not only enables BEMSs, FEMSs, HEMSs and CEMSs to function independently from one another, but also collects, processes, controls and visualizes information on the network as a whole. This system manages the entirety of the smart community by using the Smart Integration Bus, which processes massive amounts of data in real time, in combination with visualization technology.




### Weather Radars

The monitoring and prediction of local severe rainstorms requires radars with the output capacity and frequency to cover wide areas; a requirement which necessarily increases power consumption as well as the size of the devices. By using semiconductors based on advanced signal processing technology instead of conventional electronic tubes for devices that generate electric waves, Toshiba has reduced the necessary power consumption for such radars and decreased the size of their casings by half compared to the previous models.

### Airport Surveillance Radars

The airport surveillance radars required for air traffic control must be designed to save energy and equipment space for reducing the running cost. By using full digitalization technology, Toshiba has succeeded in reducing airport surveillance radars' power consumption, decreasing the size of their casings by half and minimizing their life cycle costs.

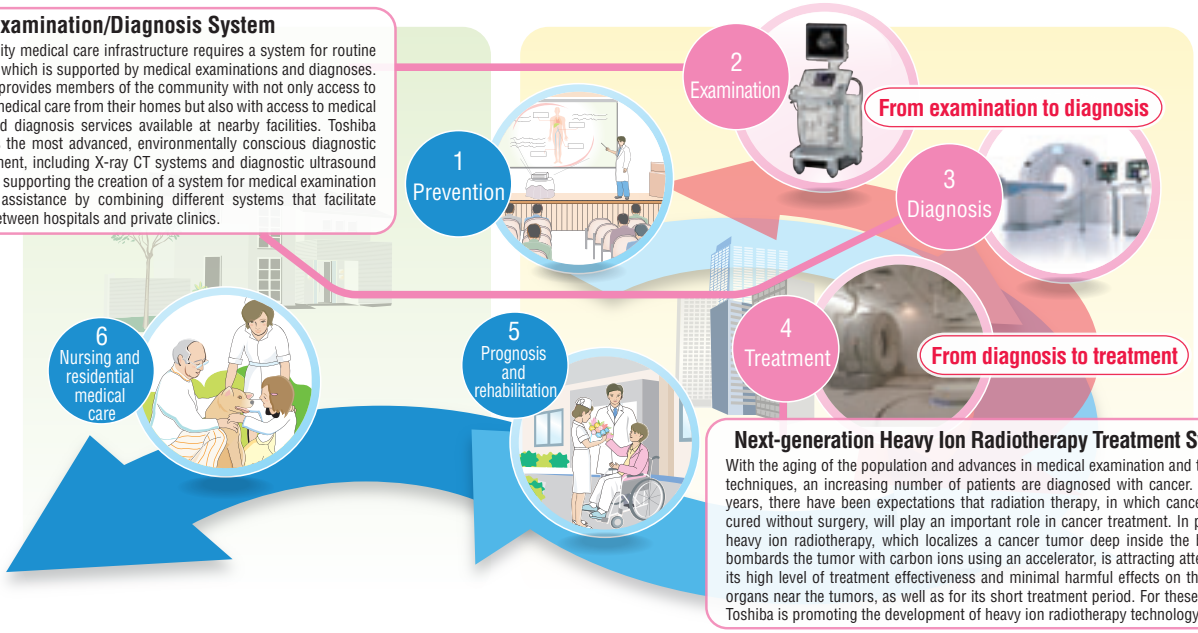
*1 SCMS: Smart Community Management System
*2 MDMS: Meter Data Management System

## Medical Care Infrastructure

In a society with a rapidly aging population, it is crucial to establish a health care system that enables members to maintain active lifestyles even as they age. To that end, the health care process—from routine preventive care, examination, diagnosis and treatment through to rehabilitation—needs to be incorporated into the community infrastructure supporting residents' lives to create a living environment which provides a sense of security.

### Examination/Diagnosis System

Smart community medical care infrastructure requires a system for routine preventive care which is supported by medical examinations and diagnoses. Such a system provides members of the community with not only access to full preventive medical care from their homes but also with access to medical examination and diagnosis services available at nearby facilities. Toshiba Group provides the most advanced, environmentally conscious diagnostic imaging equipment, including X-ray CT systems and diagnostic ultrasound systems, and is supporting the creation of a system for medical examination and treatment assistance by combining different systems that facilitate collaboration between hospitals and private clinics.




### Next-generation Heavy Ion Radiotherapy Treatment System

With the aging of the population and advances in medical examination and treatment techniques, an increasing number of patients are diagnosed with cancer. In recent years, there have been expectations that radiation therapy, in which cancer can be cured without surgery, will play an important role in cancer treatment. In particular, heavy ion radiotherapy, which localizes a cancer tumor deep inside the body and bombards the tumor with carbon ions using an accelerator, is attracting attention for its high level of treatment effectiveness and minimal harmful effects on the healthy organs near the tumors, as well as for its short treatment period. For these reasons, Toshiba is promoting the development of heavy ion radiotherapy technology.

Chapter 5

# Green Management

## Foundation of Environmental Management

**We promote environmental management by emphasizing the importance of "integrity," which means sound business management and sincerity in action**

### Summary of activities in FY2010



## Toshiba Group's Policy for the Environment

Toshiba Group promotes environmental management by focusing on environmental issues as one of its top management priorities. It has also formulated the Basic Policy for the Environment which lays out specific environmental strategies to be shared by all members of the group.

### Basic Commitment of Toshiba Group

We, Toshiba Group companies, based on our total commitment to people and to the future, are determined to help create a higher quality of life for all people, and to do our part to help ensure that progress continues within the world community.

#### Commitment to People

**We endeavor to serve the needs of all people, especially our customers, shareholders, and employees, by implementing forward-looking corporate strategies while carrying out responsible and responsive business activities. As good corporate citizens, we actively contribute to further the goals of society.**

#### Commitment to the Future

**By continually developing innovative technologies centering on the fields of Electronics and Energy, we strive to create products and services that enhance human life, and which lead to a thriving, healthy society. We constantly seek new approaches that help realize the goals of the world community, including ways to improve the global environment.**

#### TOSHIBA Group Slogan

Committed to People,
Committed to the Future. TOSHIBA

### Toshiba Group's Basic Policy for the Environment

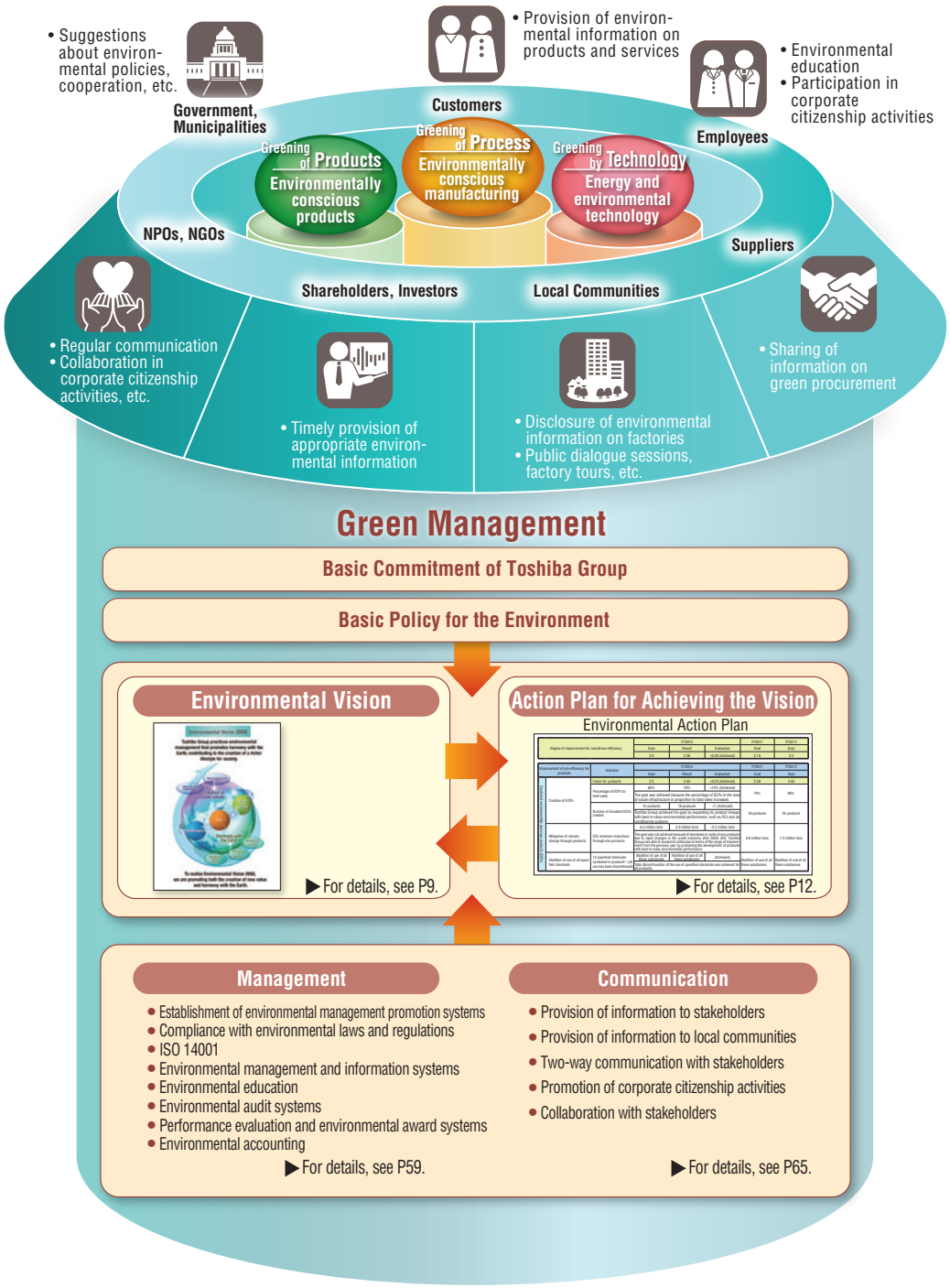
Based on the recognition that it is our responsibility to maintain the health of the global environment as an irreplaceable asset for future generations, Toshiba contributes to the development of a sustainable society by promoting environmental activities designed to realize a world that is low carbon, sound material-cycle and environmentally harmonious.

◆ **Promoting environmental management**
- **Toshiba considers environmental stewardship to be one of management's primary responsibilities and promotes environmental activities in harmony with economic activities.**
- **Toshiba assesses the impacts of its business activities, products and services on the environment, including with regard to biodiversity, and specifies objectives and targets with respect to the reduction of environmental impacts and prevention of pollution.**
- **Toshiba strives to continuously improve environmental management through internal audits and reviews of activities.**
- **Toshiba complies with all laws and regulations, industry guidelines it has endorsed, and its own standards concerning the environment.**
- **Toshiba strives to enhance the awareness of all its employees with respect to the environment and requires that they make a practical contribution to the environment through their work.**
- **Toshiba operates globally, and accordingly, promotes environmental activities throughout Toshiba Group.**

◆ **Providing environmentally conscious products and services and reducing their environmental impact through business activities**
- **Toshiba recognizes that natural resources are finite and implements vigorous environmental measures to promote their effective and practical use in terms of both products and business processes.**
- **Toshiba develops and provides environmentally conscious products and services which contribute to the reduction of environmental impacts throughout their life cycles.**
- **Toshiba strives to reduce the environmental impacts of all business processes, encompassing design, manufacturing, logistics, sale, and disposal, with a particular focus on the prevention of climate change, efficient utilization of resources and control of chemical substances.**

◆ **As a corporate citizen of planet Earth**
- **Toshiba contributes to society through its environmental activities, which include the development and provision of excellent, environmentally conscious technologies and products in cooperation with society at large and with local communities.**
- **Toshiba is committed to maximizing disclosure and transparency in communication with stakeholders and society at large in order to facilitate mutual understanding.**

In order to become one of the world's foremost eco companies, Toshiba Group is approaching environmental management from three perspectives: Greening of Process, Greening of Products, and Greening by Technology. As a foundation to support these goals, we are promoting Green Management, an initiative for continuously improving environmental management and communication.
As a basis for promoting environmental management, we have formulated the Basic Policy for the Environment, based on which we have developed the Environmental Vision, which sets numerical targets to be achieved, and Environmental Action Plan, which is designed to achieve these targets.
In promoting Green Management, in addition to giving priority to ensuring compliance with laws and regulations, we provide a wide range of environmental education programs for all employees. Along with working to acquire ISO 14001 certification, we monitor, through our own environmental audit system, the progress of environmental management, the development of environmentally conscious products, and the status of environmental activities at each business site to improve the level of these initiatives. Furthermore, in order to provide incentives to take on environmental challenges, we have developed an environmental award system for organizations, teams, and individuals as well as a performance evaluation system for in-house and key group companies, thereby facilitating continuous improvements in the level of environmental activities.
As part of its environmental communication programs, Toshiba Group communicates information on the environmental aspects of its production activities as well as products and services. It also advances initiatives to encourage considering environmental issues with the general public by promoting collaboration with stakeholders, social contribution activities, and other projects in various countries and regions around the world.



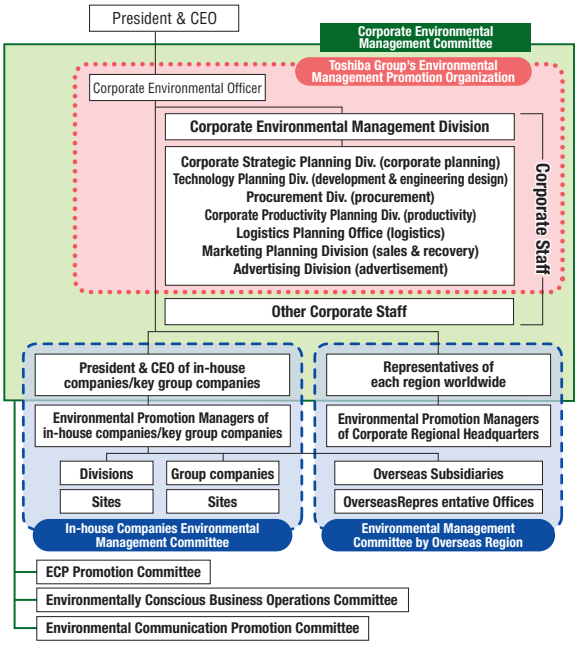

Foundation that promotes Environmental Management

# Management Structure

## Environmental Management Structure

Toshiba Group is promoting environmental management worldwide as a group. There are four pillars upholding our environmental management: (1) strengthening of the management structure, (2) provision of environmentally conscious products and services, (3) development of environmentally conscious manufacturing, sales and processing, and (4) promotion of communication. We take active measures to promote initiatives focused on these objectives. In order to promote environmental management, the Corporate Environmental Officer, Corporate Senior Executive Vice President, supervise the group as a whole, giving instructions to in-house companies and the presidents of key group companies. The Corporate Staff Environment Management Division formulates specific strategies for environmental management. With a view to promoting and strengthening environmental management throughout all companies, we have organized Toshiba Group's Environmental Management Promotion Organization, which is directly supervised by the Corporate Environmental Officer. This organization, which is a cross-functional team composed of divisions that provide direct support for Toshiba Group's businesses and services from environmental perspectives—i.e. the Corporate Strategic Planning Division, Technology Planning Division, Procurement Division, Corporate Productivity Planning Division, Logistics Planning Office, Marketing Planning Division, Advertising Division and Corporate Environment Management Division—implements various measures to promote environmental management.

### ■ Toshiba Group Environmental Management Structure




The Corporate Environmental Management Committee was formed as a group-wide decision-making organization regarding environmental management. The Corporate Environmental Officer serves as the chairperson of this committee, which holds meetings twice a year, attended by executive officers, environmental management officers of in-house companies and key group companies, and overseas environmental promotion managers of corporate regional headquarters. Various issues are examined at these meetings, such as proposals concerning environmental management, technological development, production and sales, as well as reviews of Environmental Action Plan aimed at achieving the Environmental Vision.

The following committees were organized as subgroups of the Corporate Environmental Management Committee: the Environmentally Conscious Products (ECP) Promotion Committee, which promotes the development of environmentally conscious products and technologies; the Environmentally Conscious Business Operations Committee, which promotes measures to reduce the environmental impact of business activities; and the Environmental Communication Promotion Committee, which promotes internal and external communication. These committees formulate detailed plans, identify potential problems and review measures implemented to solve problems in order to promote the sharing of information among all company members. Various committees specializing in particular themes are engaged in activities in a wide range of areas under the supervision of these committees.

**● Enhancement of the global environmental management structure**

At the global level, Toshiba Group has established corporate regional headquarters in Europe, the U.S., China and Asia-Oceania in order to collect and share information on environmental policies and regulations in each region and to provide cooperation and support for group companies in these regions in developing effective environmental strategies.

We also have an auditing system in place (for details, see P61) and promote Toshiba Group's environmental management in countries around the world through training for local auditors who conduct the environmental audits of overseas sites.

### ■ Global Environmental Management Network


## Risks and Compliance

**● Compliance with environmental laws and regulations**

Toshiba Group sets self-regulation standards stricter than legal standards regarding atmospheric emissions and discharges into hydrosphere so as to ensure that all its business sites comply with environmental rules. We conduct in-house environmental audits (for details, see P61) in order to identify potential environmental risks and to prevent environmental accidents. We also develop group-wide initiatives by sharing information, such as the results of internal audits on individual business sites, new regulation policies, and examples of accidents in other companies, among group companies. There were no violations of environmental rules and regulations discovered in Toshiba Group companies in FY2010. Detailed information is presented on our website to show what measures are taken to ensure legal compliance at our business sites.

**● Response to environmental risks**

The Risk Compliance Committee examines how to cope with diversified risks under the direct supervision of the President and also takes measures to prevent environmental risks. If any environmental risk should materialize, the Corporate Environment Management Division and the environmental promotion managers and other concerned parties of inhouse companies, key group companies and business sites work in collaboration under the direction of the Corporate Environmental Officer to implement appropriate measures, including sharing information, checking relevant business sites and preventing recurrences.

## ISO 14001

In recognition of the importance of activities at business sites in promoting environmental management, we obtained ISO 14001 certification for all of Toshiba Corp.'s 16 domestic business sites by 1997 and have maintained the certification to this day. In addition, as of June 2011, all of Toshiba Group's 205 business sites eligible for certification had obtained ISO 14001 certification. We will also acquire ISO 14001 certification for new overseas business sites that will become eligible for certification as a result of future business expansion.

Toshiba Semiconductor & Storage Products Company, Toshiba Power Systems Company, Toshiba Elevator and Building Systems Corporation, and other companies are striving to obtain integrated certification for their headquarters, sales offices, factories, and their group companies in order to develop environmental management systems for entire companies and company groups.

### ■ Number of ISO-14001-certified sites

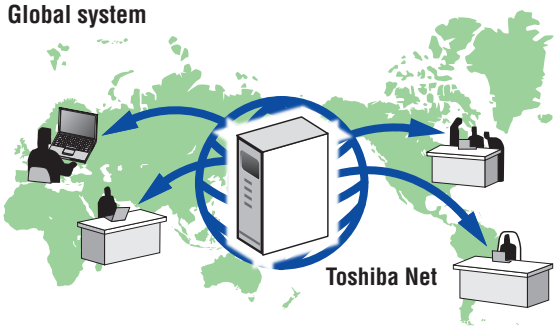
| | Eligible sites | Certified sites | Certification rate |
|---|---|---|---|
| Toshiba Corporation's business sites | 16 | 16 | 100% |
| Domestic manufacturing sites | 79 | 79 | |
| Domestic non-manufacturing sites | 46 | 46 | |
| Overseas manufacturing sites | 53 | 53 | |
| Overseas non-manufacturing sites | 11 | 11 | |
| Total | 205 | 205 | |

The list of ISO-14001-certified sites is posted on our website:
http://www.toshiba.co.jp/env/en/management/iso14001.htm

## Environmental Management Information System

We have developed an Environmental Management Information System in order to collect and manage environmental data required to promote environmental management. The Environmental Management Information System makes it possible to centrally manage and register not only performance data, such as energy consumption required for business activities and the amount of waste generated from these activities, but also environmental accounting information and the results of site environment audits. It covers all consolidated subsidiaries within the scope of management of Toshiba Group (498 companies in FY2010) and is accessible from countries around the world.

### ■ Global system




## Participation in External Organizations

Toshiba Group actively participates in and cooperates with external organizations, including trade associations, government agencies, international institutions, NGOs, and NPOs. The Group aims to contribute to the realization of a sustainable society by acting globally as a signatory to the United Nations Global Compact and the Electronic Industry Code of Conduct (EICC) as well as in its capacities as a member of the World Business Council for Sustainable Development (WBCSD) and the International Electrotechnical Commission (IEC).

## Environmental Education and Qualification

In order to raise the level of environmental activities, we provide environmental education programs for all employees. These education programs are composed of (1) position-based education courses, (2) general education courses, (3) specialized education courses, and (4) ISO 14001 education courses, offering curriculums designed to meet the needs of different posts, occupational roles, and specialties. All curricula for these courses are reviewed annually in order to help employees share the latest information.

Starting in FY2011, in addition to the existing environmental education system, we plan to introduce environmental education programs for each occupational role (such as sales or engineering), educational programs for biodiversity potential assessment methods, and so forth, thus enriching the content of our specialized environmental education programs.

### ■ Environmental education system

| Position-based education | General education | Specialized education | | ISO 14001 education |
|---|---|---|---|---|
| | | ECP education | In-house environmental auditor education | |
| Education for managers | Environmental awareness training course | e-learning (for all group company members) | Education for the certification of in-house environmental auditors | General education (for all employees and business sites) |
| Education for employees in general | Environmental education for new employees | Introductory course for environmentally conscious design | •Site auditors | Training courses for internal auditors |
| Education for new employees | | Practical course for environmental recycling design | •Technology auditors | Education for special employees |

We provide training for auditors for our in-house environmental auditing system, which was put into practice in 1993. In the training program for site auditors, candidates are screened through group education, on-site training and a written examination. After the screening, candidates participate in actual audits as assistants and submit reports in order to be certified as auditors. Technology auditors are certified through group education and a written examination. In FY2010, 20 employees were certified as site auditors, 8 as technology auditors and 9 as overseas local auditors. The current number of certified auditors is 308.

### ■ Training for auditors

Education (1 day)
↓
On-site training and written examination (1 day)
↓
Chosen as a candidate
↓
Assistance in audits (2 days, twice)
↓
Submission of audit reports (twice)
↓
Certified as an auditor

**● Knowledge required**
- Global environmental issues
- Environmental laws and regulations
- ISO environmental management system
- Environmental science and technology
- Toshiba's environmental promotion rules and structural guidelines, etc.

**● Requirements for auditors**
- Employment in positions equival-ent to or higher than section chief
- Auditors are classified into chief auditors, executive auditors and assistant auditors depending on experience and skills

**● Other**
- Education sessions are held once a year.
- The pass rate in FY2010 was about 67%.

**Toshiba Group certified auditors in FY2010**

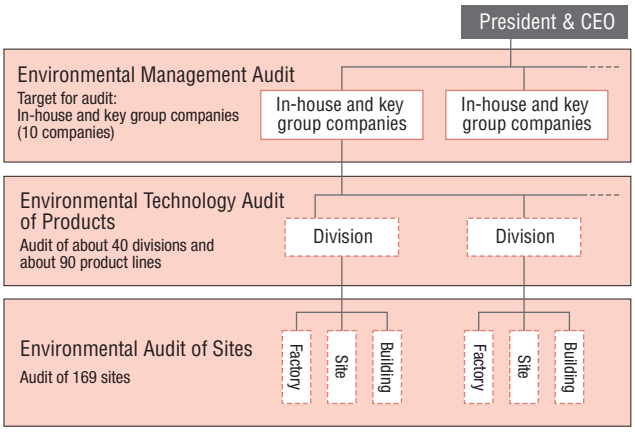
Site auditors: 167 Overseas local auditors: 40
Technology auditors: 101

# Environmental Audits

## Toshiba Group's Environmental Audit System

After conducting environmental audits for the first time in 1989, Toshiba Group developed a comprehensive environmental audit system and has been using the system since FY1993 to conduct audits based on standards established by the group. The audit system initially developed was composed of four categories: (1) management system audits (environmental activity promotion systems, etc.), (2) on-site audits (levels of compliance with rules regarding environmental facilities, etc.), (3) VPE audits (levels of achievement of goals set in voluntary plans), and (4) technology audits (product environment management system, environmental performance, etc.). Audits were conducted over two days to check these items. The most important of these categories were on-site audits, reflecting the shop-floor approach. This approach is incorporated into the environmental audits of sites conducted today.
Environmental technology audits of products became an independent category in FY1995. Environmental management audits were started in FY2004 to evaluate the level of environmental management in inhouse companies and key group companies.

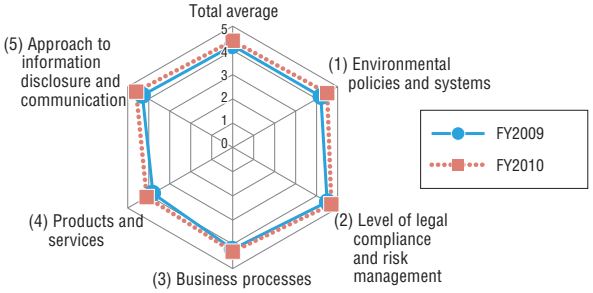
### ■ Toshiba Group's Environmental Audit System



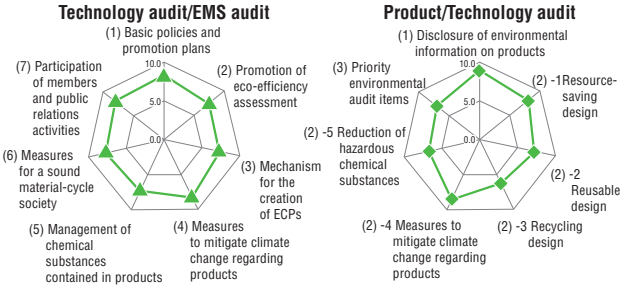

These multiple audits have been integrated into a single system since FY2006 so that they could all be conducted at once. Toshiba Group conducts (1) environmental management audits covering inhouse companies and 10 key group companies, (2) environmental technology audits of products covering about 40 divisions, and (3) environmental audits of sites covering 169 business sites, including non-manufacturing sites and non-consolidated subsidiaries. Inhouse companies and group companies conduct self-audits (self-inspections) within their companies based on the same standards in order to check business sites with relatively low levels of environmental impact that are not covered by site environment audits.
Audit items for these three audits are reviewed annually to apply stricter evaluation standards. In FY2011, we added about 20 new items and reviewed the five-grade evaluation method. By defining the required level for each audit item at present as "3" and the ideal level in the future as "5," Toshiba Group is evaluating its present status in order to step up its efforts to improve environmental performance going forward.

### ■ Audit results (FY2010)

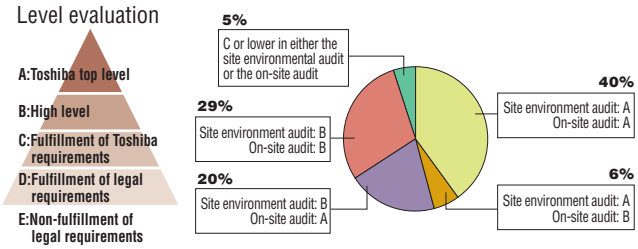
#### ● Environmental management audit (total number of check items: 71)




#### ● Environmental technology audit of products (total number of check items: 46)

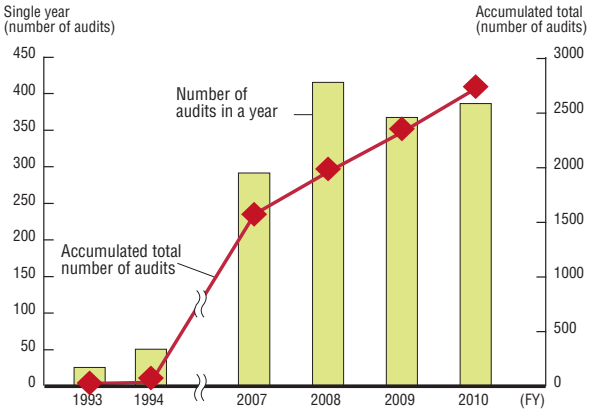



#### ● Environmental audit of sites (total number of check items: 223)




The number of audits that are conducted, including self-audits, is increasing annually and the total number of audits conducted since FY1993 has exceeded 2,500. We also provide in-house training for auditors who conduct audits (for education programs, see P60).

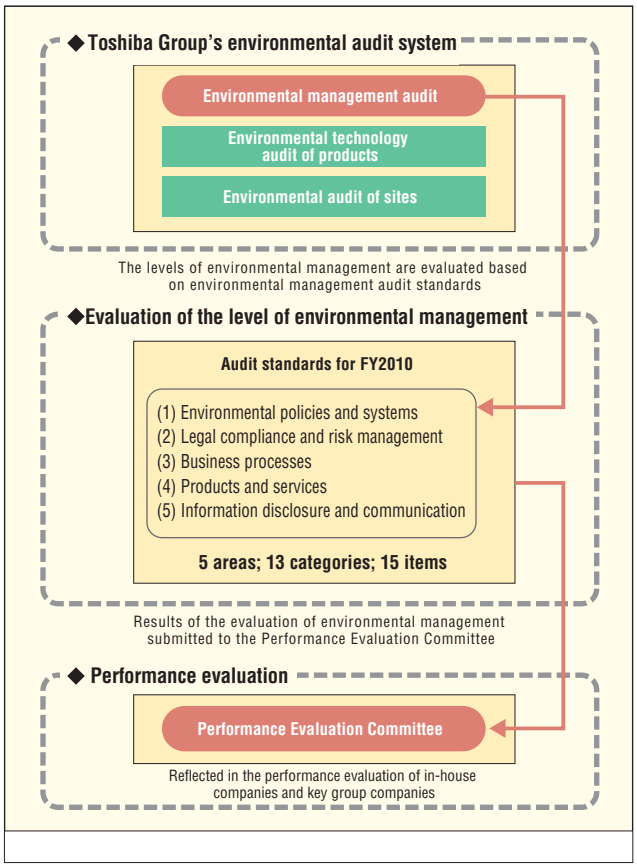
### ■ Toshiba Group's environmental audit records



# Performance Evaluation and Awards

## Performance Evaluation

Based on the Toshiba Group's environmental audit system, we evaluate the level of environmental management of all in-house companies and key group companies (10 companies). We numerically evaluate their (1) environmental policies and systems, (2) legal compliance and risk management, (3) business processes, (4) products and services, and (5) information disclosure and communication, and provide feedback. The results are reflected in the performance evaluation of these companies and serve as incentives.




## Toshiba Group Environmental Awards

In FY2003, Toshiba Group organized the Environmental Award Program in order to award the President's awards to individuals, groups and offices that have delivered outstanding performance regarding environmental management or development of environmentally conscious products, business processes and communication. Out of 33 groups carefully selected from among in-house companies and key group companies, 1 group won the Highest Performance Award and 3 groups won Outstanding Performance Awards at the Toshiba Group CSR Conference in December. For this year's official awards, we adopted a quantitative point of view regarding the identification of issues to be addressed and the measurement of the effects of environmental activities, examining initiative processes, cost reduction effects, and so forth in addition to the results obtained. In the future, we will continue to strive to improve the level of environmental management measures through the environmental award system.

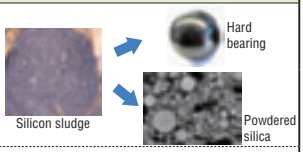
### ■ Award winners in FY2010

### ■ Projects chosen for Outstanding Performance Awards in FY2010

**Highest Performance Award**

**Toshiba LSI Package Solutions Corporation**
**Project team turns silicon sludge into valuables**

**"Advanced recycling of silicon sludge"**




The team launched an industry-academia-government joint research project to develop technologies to collect and recycle silicon sludge, thus reducing waste disposal costs. The team also contributed to the effective use of resources by turning the sludge into valuables and profiting from the sale of such valuables.

**Outstanding Performance Award**

**Toshiba America, Inc.**

**"Toshiba Earth Day 2010 (United States)"**

Toshiba America worked with its group companies to participate in an event held in New York to commemorate the 40th anniversary of Earth Day. Such participation contributed to the enhancement of Toshiba Group's environmental brand through cross-media emphasis on the Group's environmental initiatives, such as its effective use of signboards in Times Square.

**Outstanding Performance Award**

**Toshiba Power System Company Keihin Product Operations, High-efficiency turbine generator development team**

**"Development of a hydrogen-cooled, high-efficiency turbine generator with the world's largest capacity"**

The project team successfully increased turbine generator capacity using the indirect hydrogen cooling method to achieve the world's highest level of generator efficiency. Through these and other accomplishments, the team contributed to the improvement of Toshiba Group's environmental technology and the mitigation of climate change.

**Outstanding Performance Award**

**Toshiba Medical Systems Corporation**
**Ultrasound Systems Division**

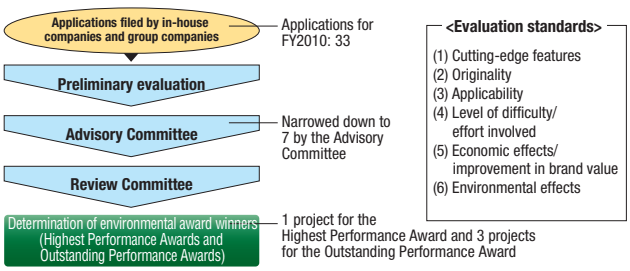
**"Diagnostic Ultrasound System Aplio™ MX"**

By developing a diagnostic ultrasound system with substantially enhanced functionality that uses the latest imaging technology and promotes environmentally conscious designs such as those for reduced power consumption and chemicals as well as for resource saving, the division contributed to the creation of eco products and the improvement of environmental technology.

### ■ Projects receiving Toshiba Group Environmental Awards

| | |
|---|---|
| **Environmental management** | Promotion of environmental management in coordination with the Environmental Vision, environmental actions and business activities |
| **Environmentally conscious products** | Design and development of environmentally conscious products, development of environmental technologies and solutions |
| **Business processes** | Activities aimed at reducing the environmental impact regarding all business processes, including research and development, design, procurement, manufacture, sale, distribution, services and recovery of products |
| **Communication** | Promotion of measures designed to raise environmental awareness inside and outside the company |

### ■ Evaluation process



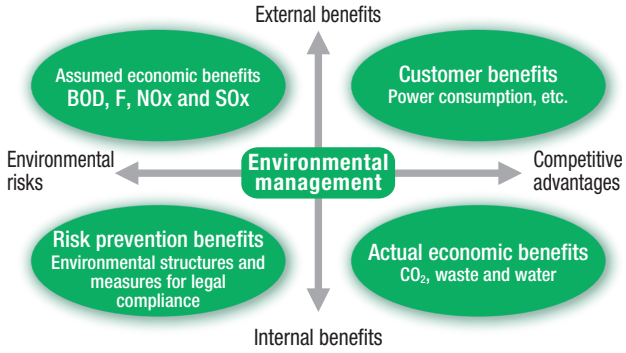
# Environmental Accounting

### ● As a tool for environmental management

With a view to promoting environmental management, Toshiba Group is working to introduce an environmental accounting approach aimed at collecting accurate data on investments and costs required for its environmental conservation initiatives and analyzing the collected data in order to reflect investment effects and cost benefits in managerial decision making.

The figure below shows an outline of the environmental accounting of Toshiba Group. Our environmental accounting assumes four basic concepts: prevention of potential environmental risks, competitive advantages, internal benefits and external benefits. We classify benefits into four categories based on combinations of these concepts to develop a comprehensive approach to environmental accounting: customer benefits due to reduced power consumption of products, assumed economic benefits estimated to result from reductions in air pollutant emissions, benefits resulting from preventing potential risks, and actual economic benefits resulting from reductions in the amount of waste and energy consumed. These categories provide useful indices of environmental management.

### ■ Environmental accounting as a tool for environmental management




### ● Environmental costs and benefits

The environmental accounting for FY2010 covers Toshiba and 498 consolidated subsidiaries. Environmental costs are categorized and calculated in accordance with the Environmental Accounting Guidelines 2005 of the Ministry of the Environment. Meanwhile, environmental impact reduction benefits are calculated in terms of both physical quantities and monetary values.

Total environmental costs increased by 1.7% from FY2009 to 55.2 billion yen. While costs required for climate change mitigation decreased in general, those for the restoration of environmental damage increased substantially because Toshiba Corp.'s Himeji Operations and group companies reported costs for restoring contaminated soil. Environmental research and development costs account for 5.4% of the total R&D costs during the fiscal year (5.8% in FY2009). Of different business sections, the electronic device section, which manufactures semiconductors and liquid crystal devices, accounts for the largest percentage (42%) of total environmental costs, followed by the social infrastructure section, which accounts for 27% of the total.

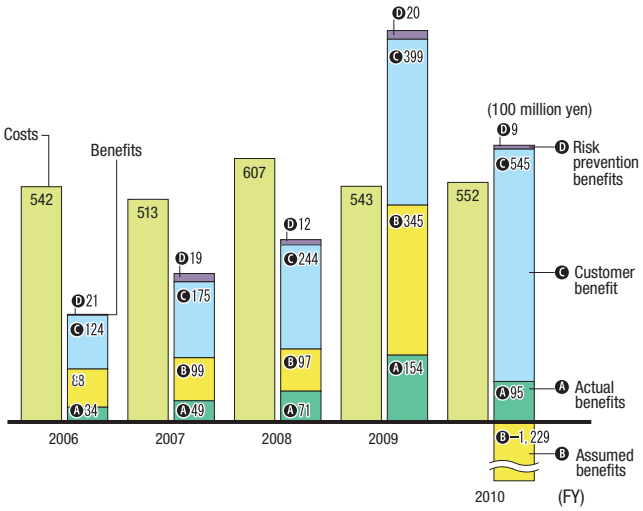
Total investments increased by 27% from FY2009 to 10.2 billion yen, with environmental investments accounting for 4.4% of total investments (3.8% in FY2009).

The total amount of environmental benefits decreased greatly, by 163%, from the previous fiscal year to –58.1 billion yen.

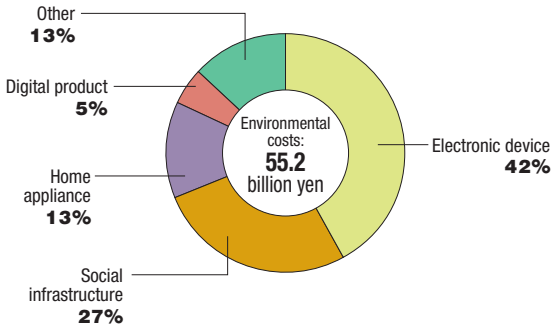
The largest reason for this decrease is that emissions of environmental pollutants increased upon Sigma Power Ariake's expansion of its thermal power generation business, rendering the assumed economic benefits negative. Since thermal power generation emits an extremely large amount of pollutants compared to other business segments, we also chose to show the assumed economic benefits excluding the effects of the power generation business in the lower part of the chart below. Those benefits decreased by 10% compared to the previous year, to 31.1 billion yen, while actual benefits were down by 38%, to 9.5 billion yen. The reason these decreases for FY2010 are less compared to FY2009 is due to the increase in the amount of pollutants emitted due to the expansion of production. On the other hand, customer benefits grew by 37% to 54.5 billion yen. Growth in sales of products, including energy-saving home appliances such as air conditioning systems and LED lamps, which greatly reduce power consumption, contributed to the increase in customer benefits.

We will continue to develop environmental conservation strategies aimed at increasing environmental benefits based on a careful analysis of environmental costs.

### ■ Environmental costs and benefits (FY2006-FY2010)




### ■ Breakdown of environmental costs by business segment (FY2010)



## Environmental costs (FY2010)

Unit: million yen

| Category | Description | Investments | | Costs | |
|---|---|---|---|---|---|
| Business area costs | Reduction in environmental impact | 6,868 | (494) | 23,296 | (-1,475) |
| Upstream/downstreamcosts | Green procurement, recycling, etc. | 1,736 | (1,103) | 2,909 | (404) |
| Administration costs | Environmental education, EMS maintenance, tree planting on factory grounds, etc. | 436 | (135) | 5,590 | (-1,894) |
| R&D costs | Development of environmentally conscious products, etc. | 333 | (-322) | 17,286 | (-1,349) |
| Public relations costs | Support for local environmental activities, donations, etc. | 18 | (-1) | 112 | (-77) |
| Environmental damage restoration costs | Restoration of polluted soil, etc. | 763 | (763) | 6,043 | (5,309) |
| Total | | 10,154 | (2,172) | 55,236 | (918) |
| | | Total investments during the period: 231 billion yen | | Total R&D costs during the period: 319.7 billion yen | |

Figures in parentheses represent increases or decreases from the previous year.

## Environmental benefits (FY2010)

Unit: million yen

| Category | Description | Amounts | | Calculation method |
|---|---|---|---|---|
| Ⓐ Actual benefits | Benefits that are represented as monetary values, such as reductions in electricity and water charges | 9,534 | (-5,914) | The amount of money, such as electricity charges and waste disposal costs, that was saved compared with the previous year, plus earnings from the sale of objects with value. |
| Ⓑ Assumed benefits | Reductions in environmental impact that are converted into monetary values | -122,854<br>31,069 | (-157,304)<br>(-3,381) | The amount of money was calculated by multiplying the cadmium equivalent value of each substance obtained from environmental standards and the American Conference of Governmental Industrial Hygienists Threshold Limit Value (ACGIH-TLV) by damage compensation for cadmium pollution. This method of calculation provides a means of showing year-on-year reductions in the environmental impact on the atmosphere, hydrosphere and soil and makes it possible to compare the environmental impact of different substances using the same standard by converting the impact into monetary values. |
| Ⓒ Customer benefits | Reductions in environmental impact during the use of products that are calculated in terms of monetary values | 54,519 | (14,632) | Environmental impact reduction benefits through the life cycle of products are evaluated in physical quantity units and monetary units (amounts of money). The life cycle of a product includes (1) procurement of materials, (2) manufacturing, (3) transportation, (4) use, (5) shipment, (6) recycling, and (7) proper disposal. Toshiba's environmental accounting focuses on environmental impact reduction benefits during the use of products. Energy-saving benefits are calculated by using the following equation: Benefits (yen) = Σ [(Annual power consumption of the previous product model – Annual power consumption of the current product model) × Number of products sold annually × Benchmark unit price of electricity] |
| Ⓓ Risk prevention benefits | Reductions in environmental risks compared with conditions prior to investments that are calculated in terms of monetary values | 891 | (-1,134) | Benefits accruing from investments in environmental structures, such as dikes, designed to prevent the pollution of soil and groundwater are evaluated as benefits of preventing potential risks. Risk prevention benefits are calculated for each capital investment item using the following equation: Risk prevention benefits = Quantity of chemical substances safely stored × Standard amount of money required for purification and restoration × Number of potential accidents. Values calculated using our own standards were used for the calculation of the standard amount of money required for purification and restoration and potential accidents in order to assess risks resulting from chemical leaks. |
| Total* | | -58,090<br>96,013 | (-149,900)<br>(4,203) | |

Note: Figures in parentheses represent increases or decreases from the previous year.

### Ⓐ Actual benefits (FY2010)

| Item | Reductions in environmental impact | Benefits measured in monetary values (in millions of yen) |
|---|---|---|
| Energy | 297,660 (GJ) | 2,979 |
| Waste | -19,576 (t) | 6,349 |
| Water | 446 (thousand $m^3$) | 205 |
| Total | | 9,534 |

Note: Reductions in environmental impact represent differences between FY2009 and FY2008.
Due to rounding errors, sums of individual figures may not equal the totals.

### Ⓑ Assumed benefits* (FY2010)

| Item | Reductions in environmental impact | Benefits measured in monetary values (in millions of yen) |
|---|---|---|
| Benefits from reductions in the amount of chemicals discharged | -1,853 (t)<br>556 (t) | -122,854<br>31,069 |

### Ⓒ Customer benefits (FY2010)

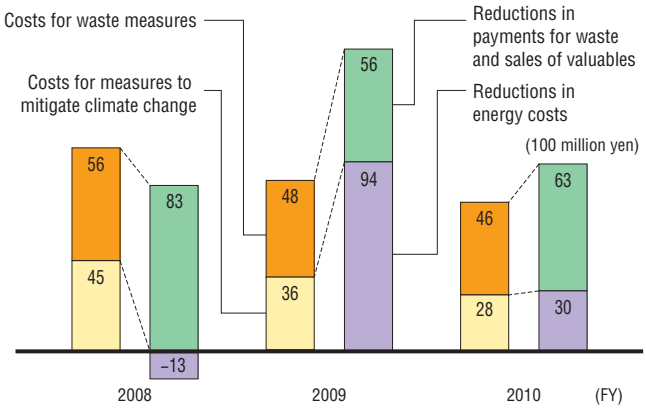
| Item | Reductions in environmental impact | Benefits measured in monetary values (in millions of yen) |
|---|---|---|
| Environmental impact reduction benefits during the use of products | 7,258,716 (t-$CO_2$) | 54,519 |

✻For assumed benefits, upper figures and lower figures stand for data on Toshiba Group and data excluding Sigma Power Ariake and Sigma Power Tsuchiura, respectively.

### ● Cost benefits of environmental management measures

The figure on the right shows the changes in the cost benefits of measures for climate change mitigation and waste disposal over the past three years. We compared the costs incurred in taking measures to mitigate climate change and dispose waste against the total amount of reductions in payments related to energy consumption and waste disposal compared to the previous year as well as sales of valuables during the current year. In the table, costs are expressed as business area costs and benefits as actual benefits.
The cost benefits for FY2008 were negative partly due to an increase in energy payments of 1.3 billion yen compared to the previous year. On the other hand, this figure indicates that in FY2009 and FY2010, the sum of cost reduction effects and sales of valuables exceeded the costs incurred.
The major issue to be addressed going forward is how to overcome two conflicting problems: an increase in emissions of environmental pollutants as a result of business expansion and the need for cost reductions. Toshiba Group will also analyze the cost benefits and other financial aspects of environmental management measures in more detail.

### ■ Cost benefits of measures for climate change mitigation and waste disposal



# Global Communication

## Activities in Europe

Europe

### Tree-planting projects in Germany and the United Kingdom

Toshiba Europe GmbH (Germany) and Toshiba Information Systems Ltd. (United Kingdom) are implementing tree-planting projects in their countries. These projects, which enable users to donate to tree-planting programs when purchasing one of the notebook PCs or TV sets covered by the projects, have been positively received as initiatives for raising environmental awareness together with customers. Thus far, a total of 2,000 trees have been planted in Germany and 5,000 in the U.K.

### Introducing LED lamps to the Louvre in France

In the Louvre's project to improve its lighting, Toshiba Corp. is providing LED lamps and supporting repair work. Our quality LED lighting technology is highly rated worldwide, and we have entered into a partnership agreement with the museum to jointly create a "lighting culture" with a focus on reducing environmental impacts. This project aims to reduce such impacts by replacing conventional incandescent lamps with more energy-saving LEDs. Plans call for Toshiba to deliver some 3,200 LED lamps to the museum by 2012 in order to illuminate the exhibits.

© 2007 Musée du Louvre / Ieoh Ming Pei / Angèle Dequier

## Activities in Asia and Oceania

Asia Oceania

### Participating in the "WEEE Can Do" project in Thailand

Toshiba Thailand Co., Ltd. is participating in the "WEEE Can Do" project, a campaign sponsored by the Thai government to collect and recycle waste electric and electronic equipment. This project targets mobile phones, printers, multifunctional peripherals, DVD players, game consoles, etc., and similar devices. Collection and recycling will occur from June through December 2011. Toshiba Thailand has installed recycling boxes at its group companies to allow its employees to easily recycle, thereby making a contribution to increase the amount of devices collected and raise employees' environmental awareness.

Opening ceremony held in June 2011

Recycling box

### Supporting a project to provide solar lanterns in India

Toshiba Plant Systems and Services Corp. is supporting the "Solar Lantern Project," an initiative to deliver lighting to people who live without electricity. The company supported NPO Gaia Initiative and provided rural communities in the Indian state of Rajasthan with a solar station consisting of 50 solar lanterns as well as solar battery charging equipment.

Solar lanterns being charged

## Activities in Japan

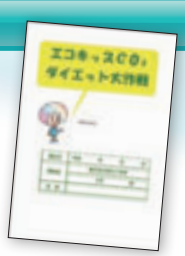
### Support for the Nationwide Campaign for Community Cleaning

Since 2007, the Toshiba Solutions Group has supported the nationwide campaign for community cleaning, a volunteer activity organized by citizens. In FY2010, it participated in all stages of the activity, from the eight months of planning and preparation to clean the banks of the lower course of the Arakawa River to the actual cleaning on the designated day. On cleaning day, 400 participants, including 138 volunteers from the Group, collected a total of three tons of garbage.

A total of 293 bags of combustibles, 84 bags of incombustibles, and 68 bags of PET bottles were collected.

### Environmental education at elementary schools

Since 2009, employees from Toshiba Corp.'s Yokkaichi Operations have visited elementary schools to hold environmental education classes using textbooks developed in partnership with Yokkaichi City and Mie Prefecture. In FY2010, a total of 300 students from four elementary schools participated in these classes, which were reported on by several TV stations and newspapers.



Textbook for FY2010

## Activities in Americas

Americas

### Participating in Earth Day in New York

Toshiba America, Inc. participated in the April 2011 Earth Day event held in New York. We installed a booth in Grand Central Station to introduce our wide range of environmentally conscious products. In addition, Toshiba America Information Systems, Inc. and the American National Red Cross jointly set up a booth in Times Square to collect donations for the victims of the Great East Japan Earthquake to support reconstruction efforts in Japan.
At the same time, Toshiba America made the most of mass media, including signboards, Facebook, and radio, to emphasize Toshiba's stance toward environmental issues.

Signboard advertising at Times Square


A Toshiba America manager appeared on a popular U.S. radio program to emphasize Toshiba's environmental initiatives


Toshiba booth in Grand Central Station

### Environmental awareness activities in Brazil

The Belo Horizonte plant of Toshiba Corp.'s Social Infrastructure Systems Company (South America) has actively been engaged in environmental activities. As part of these activities, the company is striving to ensure full communication with the local community. FY2010 activities covered a wide range of areas, including explanations to 1,300 of employees and local citizens about the plant's environmental initiatives, a donation of 500 kg of food in a campaign to reduce leftover food, and continuous efforts to keep parks and lakes clean. Thus the company contributes to raising the environmental awareness of both employees and local residents.


Event on Toshiba's environmental conservation and other efforts


Campaign to keep parks clean

## Activities in China

China

### Exhibiting at the Green Expo Japan-China 2011

In June 2011, Toshiba Group exhibited at the Green Expo Japan-China 2011, which took place in Beijing, China.
Under the theme "Balancing pursuit of affluent lifestyles and environmental conservation," the Group exhibited approximately 50 items in five categories: local communities, facilities, energy, homes, and offices. At our booths, we presented our vision for future cities, "Smart communities," as well as our latest environmentally conscious products, attracting the attention of visitors.


### Promoting activities to protect rare animals

Since 2007, Toshiba TEC Information Systems (Shenzhen) Co., Ltd. has donated funds to care for and provide medical treatment to twin pandas as part of its initiatives to protect rare animals. The twin pandas are named "Dongdong (東東)" and "Zhizhi (芝芝)" after the Toshiba (東芝) company name, and the company is using this opportunity to continuously emphasize the importance of protecting rare animals as the twins grow through mass media both inside and outside the company.
The company is also actively engaged in tree-planting and clean-up activities in Shenzhen to contribute to the neighboring communities.

## Japan


Class held by a visiting teacher

### Toshiba Science Museum

Website: http://museum.toshiba.co.jp/

The Toshiba Science Museum offers a wide range of exhibits on topics from the history of Toshiba to cutting-edge technology, attracting some 130,000 visitors from Japan and abroad annually. Among others, the presentations on environmentally conscious products and environmental quizzes and seminars for different age groups are well received by the numerous guests. In FY2011, the museum initiated a tour*1 combining visits to its facilities and the Toshiba Yokohama Complex's lagoon*2.

*1 Designed for students in the fifth and sixth grades of elementary school
*2 A stretch of water in which a wide range of plants and animals live


Environmental quiz for elementary school students

# Providing Information to Stakeholders

## Environmental Report and Website


Toshiba Group Environmental Report 2010 (available in Japanese and English; only PDF data is available in Chinese)

Since the publication of the first volume of its environmental report in 1998, Toshiba Group has disclosed its environmental information every year. The Toshiba Group Environmental Report 2010, which was published last year, received the Environment Minister's Award (three years in a low) at the 14th Environmental Communication Awards hosted by Japan's Ministry of the Environment and the Special Award in Toyo Keizai Inc.'s 14th Environmental & Sustainability Report Awards.

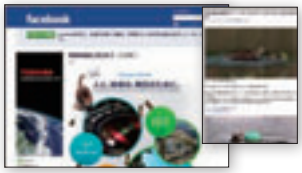
We also provide more detailed, up-to-date information on our environmental website in addition to the content found in our environmental reports. We conduct questionnaires on our website to collect stakeholder opinions.

We also disclose information on our company's Facebook page to report our environmental initiatives.

Toshiba Group's environmental website
http://www.toshiba.co.jp/env/en


"Toshiba eco style" site
http://ecostyle.toshiba.com

Questionnaire on our website



Report disclosed on Facebook

## Advertisements

We are deploying advertisements using "The Little Prince" as a promotional character in Japan to communicate our environmental initiatives. We are also deploying a corporate advertisement with the slogan "What everyone can do. What Toshiba can do." that introduces ways of saving electricity at homes and offices as well as the power-saving functions of our products.


Advertisement featuring "The Little Prince"

"White products" TV commercial aimed at power saving

"Digital products" TV commercial aimed at power saving

Furthermore, on our website accompanying the advertisements, we present tips for saving electricity through "Toshiba eco style." For example, we post information on Toshiba products that contribute to saving electricity and related links (for details, see P6).

Being clever about saving electricity with "Toshiba eco style"

## Exhibitions

We take an active part in presenting our products and technologies at various exhibitions around the world in order to have our environmental initiatives understood by as many people as possible.

**• Major exhibitions recently participated by Toshiba**

| | | |
|---|---|---|
| June 2011 | Green Expo Japan-China 2011 | China |
| February 2011 | 7th Eco-Products International Fair | India |
| January 2011 | 20th Toshiba Group International Exhibition | Toshiba headquarters, Tokyo, Japan |
| January 2011 | 2011 International CES | United States |
| December 2010 | Eco-Products 2010 | Tokyo, Japan |
| October 2010 | Interactive Fair for Biodiversity | Nagoya, Japan |
| September 2010 | IFA/Berlin International Consumer Electronics Show | Germany |


Eco-Products 2010 (Japan)

CES 2011 (USA)

Toshiba Group Environmental Exhibition (Japan)


Eco-Products International Fair (India)

## Site Report

In order to present an overview of business activities at our production sites around the world and to have our environmental initiatives understood by local community residents, we disclose environmental information for each of our production sites. We summarized major environmental initiatives in FY2010 and presented digest reports on about 126 sites on our websites. Some of our production sites publish their own reports and present their information on the website. Copies of these reports are also distributed to visitors to our factories.

Digest reports of manufacturing sites

Environmental reports of manufacturing sites

Site report
http://www.toshiba.co.jp/env/en/company/region.htm

# Partnership with Stakeholders

## Holding stakeholder dialogues regularly

Toshiba Group regularly holds stakeholder dialogues to learn the opinions and requests of stakeholders regarding environmental management. In the United States, we hold a stakeholder dialogue once every two years, inviting representatives from environmental NGOs as well as research organizations for socially responsible investments (SRI). The third dialogue was held in January 2011.
At the third dialogue, opinions were exchanged mainly concerning Toshiba Group's activities in the U.S. and information disclosure through environmental reports, among other subjects. One participant expressed the opinion that in the future, to make its presence felt more in the U.S., Toshiba ought to develop not only a global strategy for the entire group but also step up efforts to cope with regional problems and implement such plans strategically by, for example, painting a clear vision of what the company aims to become. The participant mentioned an expectation that Toshiba participate in industry-led consortiums and other initiatives for those problems difficult to solve alone.
In addition to the U.S., we have held many stakeholder dialogues in Japan, China, Thailand, and other countries. We will continue to hold stakeholder dialogues in the future in order to incorporate stakeholder opinions into our environmental activities.

● **Third Environmental Dialogue in the U.S.**

| | |
|---|---|
| Date: | January 13, 2011 |
| Venue: | Conference room at the Business for Social Responsibility (BSR) headquarters in San Francisco |
| Participants: | Pacific Gas & Electric (public utility)<br>Environmental Defense Fund (environmental NGO)<br>Pacific Institute (water-related consultancy)<br>As You Sow (SRI-related organization)<br>SW Consulting (environmental consultancy)<br>Business for Social Responsibility (corporate responsibility advocate)<br>Representatives from Toshiba's U.S. Regional Headquarters and others |

## Involvement in Environmental Campaign

● **Carbon Dioxide Reduction/Light-Down Campaign in Japan**
We participated in the Black Illumination 2010 campaign (June 21) and the Star Festival Light-Down campaign (July 7) organized by the Japanese Ministry of the Environment and turned off all signboard illuminations in offices and towns. Toshiba Group designated the period between June 20 and July 7 as a voluntary campaign period and saved 13,298 kWh of electricity at 81 facilities in Japan and abroad. This amounts to about 3.7 years of electricity consumed by one home.

● **Earth Hour 2011**
Toshiba Group companies in various countries around the world participated in Earth Hour 2011, an event hosted by the World Wildlife Fund that calls for people to make a global effort to turn off lights at the same time. On the day of the event, in addition to turning off signboards and other outdoor lights in major cities worldwide, including New York, Paris, London, Jakarta, Hanoi, Ho Chi Minh, Mumbai, Beijing, Shanghai, and Hong Kong, our companies called on their employees to reduce electricity consumption.

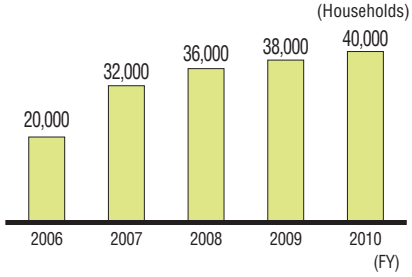

New York's Times Square　Paris　Shanghai

Earth Hour was announced internally at Toshiba Semiconductor (Thailand) Co., Ltd.

To make a stronger appeal for saving electricity, Toshiba Storage Device (Philippines), Inc. distributed fluorescent lamps to employees participating in the event.

● **Promotion of the Environmental Accounts Campaign**
Since 2005, Toshiba Group has participated in the Eco Family campaign of Japan's Ministry of the Environment in order to improve environmental awareness among our employees and facilitate environmental conservation activities at home. In March 2011, the number of families with a registered environmental accounts book, a key element of this initiative, was approximately 40,000. In 2007, upon the number exceeding 20,000, the Group was officially commended by the Minister of the Environment, and in recent years, we calculated $CO_2$ emissions from the families of our employees in Japan on a trial basis using data from these environmental accounts books. As typified by these and other efforts, we have actively carried out activities in this area. Though the Eco Family campaign ended on March 31, 2011, we will continue to support each family's efforts by providing tools for downloading the environmental accounts books and in other ways. In addition, we officially registered for Power Saving Action, a campaign for the summer of 2011 led by the Ministry of Economy, Trade and Industry's Agency for Natural Resources and Energy. Thus we will continue to actively promote energy-saving efforts at home by the families of our employees.

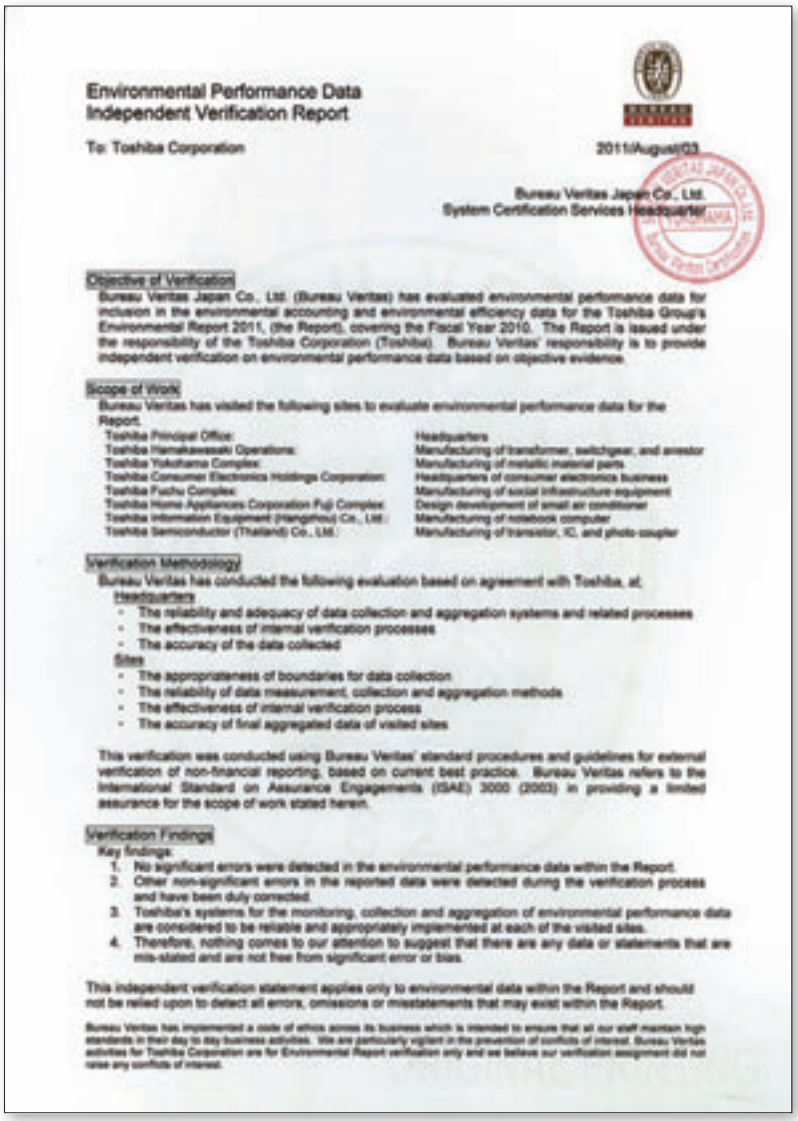
■ **Number of Toshiba Group employee families registered with the Eco Family campaign**



# Third-Party Evaluation

In order to improve the reliability of the environmental performance data presented in this report, Toshiba Group requested Bureau Veritas Japan Co., Ltd.* to conduct a third-party verification of the data. Global data regarding the results for FY2010 was reviewed to check the processes of the collection, aggregation and internal verification of data and the accuracy of aggregated data.

* A certification organization that conducts inspections, reviews and certification regarding ships, buildings, health, safety, the environment, systems and consumer products (URL: http://certification.bureauveritas.com)



Environmental Performance Data
Independent Verification Report

To: Toshiba Corporation

2011/August/03

Bureau Veritas Japan Co., Ltd.
System Certification Services Headquarter

Objective of Verification

Bureau Veritas Japan Co., Ltd. (Bureau Veritas) has evaluated environmental performance data for inclusion in the environmental accounting and environmental efficiency data for the Toshiba Group's Environmental Report 2011, (the Report), covering the Fiscal Year 2010. The Report is issued under the responsibility of the Toshiba Corporation (Toshiba). Bureau Veritas' responsibility is to provide independent verification on environmental performance data based on objective evidence.

Scope of Work

Bureau Veritas has visited the following sites to evaluate environmental performance data for the Report.

| | |
|---|---|
| Toshiba Principal Office: | Headquarters |
| Toshiba Hamakawasaki Operations: | Manufacturing of transformer, switchgear, and arrestor |
| Toshiba Yokohama Complex: | Manufacturing of metallic material parts |
| Toshiba Consumer Electronics Holdings Corporation: | Headquarters of consumer electronics business |
| Toshiba Fuchu Complex: | Manufacturing of social infrastructure equipment |
| Toshiba Home Appliances Corporation Fuji Complex: | Design development of small air conditioner |
| Toshiba Information Equipment (Hangzhou) Co., Ltd.: | Manufacturing of notebook computer |
| Toshiba Semiconductor (Thailand) Co., Ltd.: | Manufacturing of transistor, IC, and photo-coupler |

Verification Methodology

Bureau Veritas has conducted the following evaluation based on agreement with Toshiba, at;

Headquarters
- The reliability and adequacy of data collection and aggregation systems and related processes
- The effectiveness of internal verification processes
- The accuracy of the data collected

Sites
- The appropriateness of boundaries for data collection
- The reliability of data measurement, collection and aggregation methods
- The effectiveness of internal verification process
- The accuracy of final aggregated data of visited sites

This verification was conducted using Bureau Veritas' standard procedures and guidelines for external verification of non-financial reporting, based on current best practice. Bureau Veritas refers to the International Standard on Assurance Engagements (ISAE) 3000 (2003) in providing a limited assurance for the scope of work stated herein.

Verification Findings

Key findings:

1. No significant errors were detected in the environmental performance data within the Report.
2. Other non-significant errors in the reported data were detected during the verification process and have been duly corrected.
3. Toshiba's systems for the monitoring, collection and aggregation of environmental performance data are considered to be reliable and appropriately implemented at each of the visited sites.
4. Therefore, nothing comes to our attention to suggest that there are any data or statements that are mis-stated and are not free from significant error or bias.

This independent verification statement applies only to environmental data within the Report and should not be relied upon to detect all errors, omissions or misstatements that may exist within the Report.

Bureau Veritas has implemented a code of ethics across its business which is intended to ensure that all our staff maintain high standards in their day to day business activities. We are particularly vigilant in the prevention of conflicts of interest. Bureau Veritas activities for Toshiba Corporation are for Environmental Report verification only and we believe our verification assignment did not raise any conflicts of interest.

## Reference View

Bureau Veritas has conducted environmental performance data verification for the "Toshiba Group Environmental Report 2011." The following conclusions are made as a result of the work.

## 1. Positive Findings

- The Environment Management Information System (EMIS) for data aggregation, counting, and reporting is gradually and efficiently being implemented across all of Toshiba's group companies.
- Toshiba's Head Office has detected abnormal values, and those that have noticeably changed compared with the previous year, resulting in a low probability of miscalculations and misreporting in the final data.
- This verification has been the second in consecutive years for the Toshiba overseas sites. The production sites have shown much interest in environmental issues, and personnel were fully cooperative with the verification process. Data collection and aggregation has been expanded globally under cooperation from Toshiba's Head Office.

## 2. Follow-up of Issues from Reference View report for the "Toshiba Group Environmental Report 2010"

- The data management has gradually improved by using an automatic computation, although there is still a manual calculation being conducted on certain data items at some sites.
- Although the progress seems to be varied at each site, the methodology for data aggregation has been well documented.

## 3. Opportunities for Improvement

- It is recommended that a system to prevent errors in data input such as double-checking should be established, particularly at sites where manual calculations are still present.
- It is observed that some new staff with responsibility for data aggregation has not been given sufficient information for the purpose of collecting data. Training is recommended to ensure that any risk to data collection and calculation is minimized in the event of staff hand over.
- Each in-house company has responsibility to check the environmental performance data for individual site, but data anomalies or errors are often found by Toshiba's Head Office from this process. It is recommended that the head office supervises the effectiveness of the in-house companies' data management in order to maintain the collection and collation of accurate data from all sites.

# Evaluation by External Parties (FY2010 results)

| Award title | Award-winning item(s) | Evaluated entity |
|---|---|---|
| Evaluation of products | | |
| 7th Eco-Products Awards,<br>Chairperson's Award, Eco-Products Awards Steering Committee | Diagnostic Ultrasound System Aplio™ MX (SSA-780A)  | Toshiba Medical Systems Corp. |
| The 7th LCA Society of Japan Awards,<br>JLCA Chairman's Award | Promotion of LCA in product development and environmentally conscious designing of an entire product lineup  | Toshiba Corp. Digital Products & Network Company<br>(Current Toshiba Corp. Digital Products & Services Company) |
| Eco-Efficiency Awards 2010,<br>Eco-Efficiency Special Award | Development of long-life, environmental load-reducing rechargeable battery SCiB™  | Toshiba Corp. Transmission Distribution & Industrial Systems Company<br>(Current Toshiba Corp. Social Infrastructure Systems Company) |
| Certificate from PCBC to create of a broad line of products awarded the EU Ecolabel and recognized as the most environmentally friendly throughout their life cycle | LCD TVs (40VL748, 46VL748, 40VL758, 46VL758, 40WL768, 46WL768, 55WL768)  | Toshiba Television Central Europe Sp. zo.o. (TTCE) in Poland |
| Evaluation of business activities | | |
| Grand Prize<br>Iwate Prefecture Southern Part Wide-area Promotion Bureau Environmental Award | Environmental conservation activities in general | Iwate Toshiba Electronics Co., Ltd. |
| Henan Province Green Company | Environmental conservation activities in general | Henan Pinggao Toshiba High-Voltage Switchgear Co., Ltd. (China) |
| Dalian Environmental Conservation Nonprofit Activities Excellent Contribution Award | Environmental conservation activities | Toshiba Dalian Co., Ltd. (China) |
| FY2009-10 Dalian Organization of the Advancement of Environmental Publicity and Education | Environmental conservation activities | Toshiba Dalian Co., Ltd. (China) |
| FY2010 Hunnan New District Environmental Conservation Green Company | Environmental management activities | Toshiba Elevator (Shenyang) Co., Ltd. (China) |
| 2010 Hangzhou City Economic Development Area, Energy Conservation Award | Energy-saving activities | Toshiba Information Equipment (Hangzhou) Co., Ltd. (China) |
| 2010 Hangzhou City Economic Development Area, Green Production Award | Green production activities | Toshiba Information Equipment (Hangzhou) Co., Ltd. (China) |
| Passed the FY2010 Hangzhou Electricity Balance Test | Management of electricity usage | Toshiba Hydro Power (Hangzhou) Co., Ltd. (China) |
| Good Governance Project 2010 (Awarded by the Ministry of Industry, Thailand) | Environmental community activities | Toshiba Semiconductor (Thailand) Co., Ltd. |
| Secretary's Award for Energy Efficiency/Outstanding Energy Manager Award | Energy-saving activities | Toshiba Information Equipment (Philippines), Inc. |
| Philippine Environment Partnership Program (PEPP) Seal of Approval | Environmental conservation activities | Toshiba Information Equipment (Philippines), Inc. |
| Success Story Award for Climate Change Prevention/Outstanding Pollution Control Officers Award | Atmosphere and hydrosphere conservation activities | Toshiba Information Equipment (Philippines), Inc. |
| LLDA Silver Rating Award/Outstanding Pollution Control Officers Award | Environmental conservation activities at the Laguna Lake | Toshiba Information Equipment (Philippines), Inc. |
| Don Emilio Abello Energy Efficiency Award and Outstanding Energy Manager | Energy-saving activities | Toshiba Storage Device (Philippines), Inc. |
| Evaluation of communication programs | | |
| The 14th Environmental Communication Awards,<br>Environment Minister's Award for Environmental Reporting of Mitigation Measures for Climate Change | Toshiba Group Environmental Report 2010 (along with the CSR Report 2010, Social Contributions Activities Report 2010 and Annual Report 2010) | Toshiba Corp. |
| Toyo Keizai Inc.'s 14th Environmental and Sustainability Report Awards,<br>Special Award (category: environmental reports) | Toshiba Group Environmental Report 2010 | Toshiba Group |
| Best Report<br>FY2009 Dalian Sustainability Reports (Environmental Reports) | Environmental Report  | Toshiba Dalian Co., Ltd. (China) |
| 59th Nikkei Advertising Awards (Grand Prix)<br>30th Newspaper Advertising Prize, Newspaper Advertisement Award (Grand Prix)<br>59th Asahi Advertising Awards, Asahi Advertising Award (Grand Prix)<br>63rd Dentsu Advertising Awards, Newspaper Advertising Award<br>78th Mainichi Advertising Design Awards, Award of Excellence<br>26th Yomiuri Advertising Awards, Award of Excellence (category: technology) | Advertisement on Toshiba's decision to cease production of incandescent bulbs  | Toshiba Corp. |
| 63rd Dentsu Advertizing Awards,<br>Environmental Advertizing Award | LED advertising  | Toshiba Corp. |
| Fuji Sankei Business i, 49th Business Advertising Awards,<br>Business Advertising Award (Grand Prix) | Series advertising for phosphorus recovery technology (water solution)  | Toshiba Corp. |

| | | |
|---|---|---|
| Evaluation by the mass media and SRI | | |
| Ranking based on the 14th Environmental Management Level Survey by Nikkei Inc. | 3rd place (category: manufacturing) | Toshiba Corp. |

# We would like to hear your opinions and impressions on our report.

We would be grateful if you would share your opinions and impressions on the Toshiba Group Environmental Report 2011 with us so that we can provide environmental reports better suited to the needs of the public.

Please fill out the questionnaire on the back of this sheet and send it to the Corporate Environment Management Division, Toshiba Corporation by fax.


Corporate Environment Management Division, Toshiba Corporation

**Fax: +81-3-5444-9206**
**Tel: +81-3-3457-2403**



**Use of FSC-certified Paper**
Paper certified by Forest Stewardship Council (FSC) is used, which is made from wood from FSC-certified forests.


**Non-VOC Ink**
100% vegetable ink containing no volatile organic compounds (VOCs) is used.


**Waterless Printing**
Waterless printing, a printing process that eliminates the use of water, is adopted, taking advantage of the characteristics of printing plates made of ink-shedding material.

# Toshiba Group Environmental Report 2011 Questionnaire Survey

## Fax: +81-3-5444-9206

**We appreciate your comments and suggestions. (To Corporate Environment Management Div., Toshiba Corp.)**

**Q1. How do you rate Toshiba Group's Environmental Report 2011?**

☐ Excellent ☐ Good ☐ Satisfactory ☐ Unsatisfactory ☐ Poor

**Q2. Please state the reason(s).**

( )

**Q3. What are your expectations for Toshiba Group Environmental Report and disclosure of environmental information?**

( )

**Q4. What is your evaluation of Toshiba Group Environmental Report 2011?**

| | | | | |
|---|---|---|---|---|
| a. | Content | ☐ Excellent | ☐ Satisfactory | ☐ Insufficient |
| b. | Design | ☐ Good | ☐ Satisfactory | ☐ Poor |
| c. | Length | ☐ Long | ☐ Appropriate | ☐ Short |
| d. | Ease of understanding | ☐ Easy | ☐ Satisfactory | ☐ Difficult |

Please state your reason(s).

( )

**Q5. Which subject(s) were you most interested in and why? (multiple answers possible)**

☐ Highlights ☐ Greening of Process (Environmentally Conscious Manufacturing)
☐ Greening of Products (Environmentally Conscious Products) ☐ Greening by Technology (Energy and Environmental Technology)
☐ Green Management (Foundation of Environmental Management)
Please state your reason(s).

( )

**Q6. Which of the following best describes you or your affiliation?**

☐ Customer ☐ Shareholder ☐ Supplier ☐ Financial/investment institution ☐ Government or governmental body ☐ Journalist
☐ Research/educational institution ☐ Student ☐ Involved in the following at a company/organization: ☐ Environment ☐ CSR
☐ Technology ☐ Sales ☐ Human resources ☐ Procurement ☐ Social contribution ☐ Customer relations ☐ Other ( )
☐ Environmental NGO/NPO ☐ Environmental specialist ☐ Resident in a community where Toshiba Group has premises
☐ Toshiba Group Employee ☐ Other (Please specify: )

**Q7. How did you come to know this Environmental Report? Choose media described below.**

☐ Newspaper ☐ Magazine ☐ Website ☐ Seminar ☐ Exhibition ☐ Through Toshiba Group Employee ☐ Other ( )

**Q8. Please feel free to comment or make suggestions.**

( )

**Thank you for your cooperation. We would appreciate if you could complete the form below.**

Name Male/Female Age

Address Zip code e-mail

Occupation/Organization Department/Title

Your comments and suggestions may be referred in the next report. Toshiba will manage your personal data in an appropriate manner, ensuring that no leakage or loss occurs. Toshiba may use your personal data for the purpose of sending you the next Environmental Report, responding to your inquiry, and/or for analysis on the basis of age group and sex. If you wish to correct, revise or delete your personal data, please contact the Corporate Environment Management Division of Toshiba Corporation.

## Committed to People, Committed to the Future.


**TOSHIBA CORPORATION**

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105-8001, Japan

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**Inquiry page on Toshiba website**
URL: http://www.toshiba.co.jp/env/en/contact/


**The report is also available on the Toshiba website**
**URL http://www.toshiba.co.jp/env/en/**

**The production and printing of this report reflect the following considerations:**

### Paper

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**Use of Forest Thinning Support Paper**
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**Waterless Printing**
Waterless printing, a printing process that eliminates the use of water, is adopted, taking advantage of the characteristics of printing plates made of ink-shedding material.

VOC Free

**Non-VOC Ink**
100% vegetable ink containing no volatile organic compounds (VOCs) is used.


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