TOSHIBA

Leading Innovation

# 2015 Environmental Report

Human Smart Community

by lifenology - the technology life requires

# Toshiba Group Business Overview

## Company Overview (as of March 31, 2015)

| | |
|---|---|
| **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** | 6,655.9 billion yen |
| **Number of employees (consolidated)** | 198,741 |

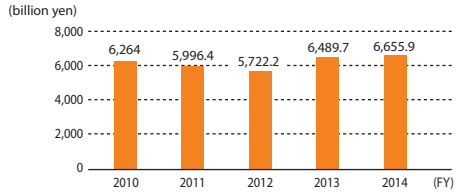
**CSR-related international charters/guidelines Toshiba endorses**

- United Nations Global Compact
- Global Reporting Initiative (GRI)
- Electronic Industry Code of Conduct (EICC)

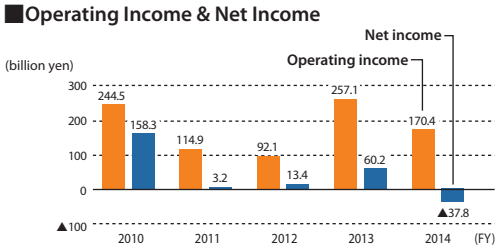
| | |
|---|---|
| **Number of shareholders** | 391,614 |
| **Number of shares issued** | 4,237,600,000 shares |
| **Number of consolidated subsidiaries** | 584 (167 in Japan, 417 overseas) |
| **Number of affiliates accounted for by the equity method** | 217 |
| **Stock exchange listings** | Tokyo, Nagoya |

## Financial Results (Consolidated)

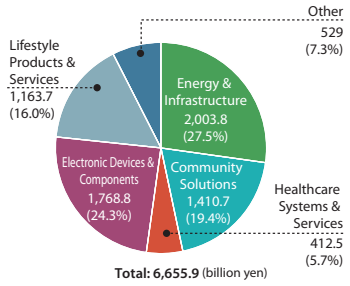
### Net sales




### Operating Income & Net Income

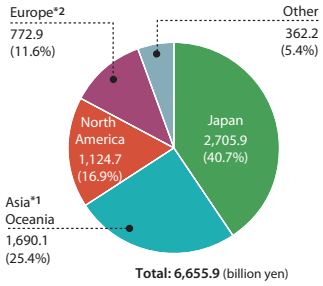



### Sales by Business Segment (FY2014)



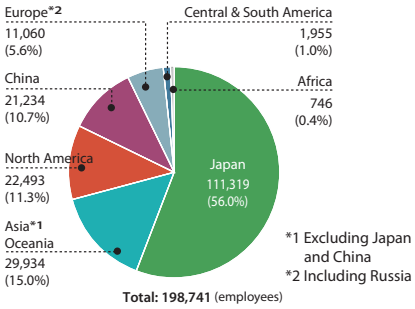

**Total: 6,655.9** (billion yen)

### Sales by Region (FY2014)




**Total: 6,655.9** (billion yen)

### Number of Employees by Region (FY2014)




*1 Excluding Japan and China
*2 Including Russia

**Total: 198,741** (employees)

Note: Eliminations of sales among segments were 632.6 billion yen.

## Main Products and Services

### Energy & Infrastructure

Thermal and nuclear power generation systems; hydroelectric, photovoltaic, geothermal, and wind power generation systems; power transmission-transformation-distribution systems; smart meters; smart grid systems; railway and automotive systems; motors and drives; rechargeable batteries; security and automation systems; radio systems

### Community Solutions

Urban infrastructure solutions; building solutions such as air conditioners, lighting, and elevators; home solutions

### Healthcare Systems & Services

Diagnostic imaging units such as MRIs and CT scanners; heavy ion radiotherapy systems

### Electronic Devices & Components

NAND flash memories; storage products (HDDs, SSDs); discrete semiconductors; system LSI

### Lifestyle Products & Services

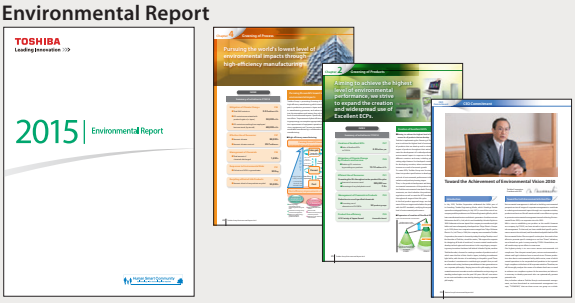
Home electrical appliances such as TVs, Blu-ray disc recorders, PCs, tablets, refrigerators, and washing machines

# Editing Policy

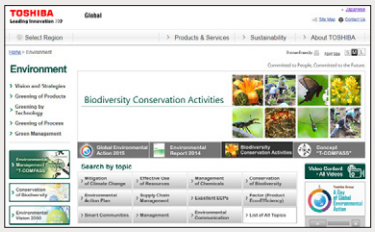
Toshiba Group has published the Environmental Report since FY1998 (from FY2004 to FY2007, environmental information was provided in the CSR Report). This report is published to provide detailed environmental information on Toshiba Group to all stakeholders of the Group. The content of the FY2015 edition includes information on the progress of the Fifth Environmental Acton Plan, initiatives for products with the highest level of environmental performance, and production sites' efforts to reduce environmental impacts, as well as feature articles on natural capital accounting and protection of rare species. At the same time, to contribute to reduction in environmental impact, this report will be published only on Toshiba's website with its print version not issued.

■ Providing detailed environmental information
http://www.toshiba.co.jp/env/en/index.htm

**Environmental Report**




**Website for environmental activities**




More detailed information and other data are available on the website for environmental activities.

■ Providing financial information

**Annual report**
http://www.toshiba.co.jp/about/ir/en/finance/index.htm

**Website for investor relations**
http://www.toshiba.co.jp/about/ir/index.htm

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

**CSR Report**
http://www.toshiba.co.jp/csr/en/report/index.htm

**Website for CSR activities**
http://www.toshiba.co.jp/csr/en/index.htm

# Contents



## ● Organizations covered

In principle, this report covers Toshiba Group (Toshiba Corporation and its 584 consolidated subsidiaries in Japan and overseas). In cases where the report covers entities other than Toshiba Group, the individual entities are indicated.
* In this report, "Toshiba" refers to Toshiba Corporation.

## ● Reporting period

This report focuses on the results of activities in FY2014 (April 1, 2014 to March 31, 2015), but includes some activities continuing from the past and some more recent activities.

## ● Publication

The current issue was published in February 2016 (The publication of the next issue is scheduled for August 2016; the previous issue was published in November 2014).

## ● Significant change during the reporting period

Toshiba acquired shares of UK-based New Generation Co., Ltd. and made the company its consolidated subsidiary. Outside the reporting period (in September 2015), Toshiba corrected its financial results for past years (FY2009 to FY2013).

## ● Reference guidelines

- GRI (Global Reporting Initiative)
  Sustainability Reporting Guidelines Fourth Edition (G4)
  Note: GRI Content Index shown on the website
- Environmental Reporting Guidelines 2012
- 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, please visit our website for environmental activities.

# CEO Commitment

# Toward the Achievement of Environmental Vision 2050

Toshiba Corporation
President and CEO
M. Muromachi

## Introduction

In July 2015, Toshiba Corporation celebrated the 140th year of its founding. Tanaka Engineering Works, which Hisashige Tanaka opened as a telegraph factory in July 1875, is one of the roots of our company and the predecessor to Shibaura Engineering Works, which later manufactured motors and electric generators. Another root was Hakunetsu-sha & Co., Ltd., which was founded by Ichisuke Fujioka in 1890. Hakunetsu-sha was Japan's first company to manufacture light bulbs and was subsequently developed into Tokyo Electric Company. In 1939, these two companies were merged into Tokyo Shibaura Electric Co., Ltd. Then, in 1984, the company was renamed as Toshiba Corporation, the name it is known by today. Hisashige Tanaka, one of the founders of Toshiba, coined the motto, "We respond to requests for designing all kinds of machines," to meet societal needs and to develop technologies and innovations. In this way a legacy comprising many inventions has been left behind. Ichisuke Fujioka, another Toshiba founder, is known for creating a number of products each of which were the first of their kind in Japan, including incandescent light bulbs, with the aim of contributing to the public good. These two founders' commitment to contributing to people's lives, as well as culture and society, has been passed down to later generations as our corporate philosophy. Staying true to this philosophy, we have created numerous innovations and contributed to society using outstanding technologies over the past 140 years. We will now return to our roots and make a new start by sharing our group's corporate philosophy.

## Toward the Sixth Environmental Action Plan

Environmental management is defined as building environmental perspectives into all stages of corporate management to contribute to reducing environmental impact through our corporate activities, products and services. We will remain united in our efforts as a group to promote environmental management toward achieving Environmental Vision 2050, our corporate vision for 2050.

With a view to establishing our position as the world's foremost eco-company by FY2015, we have strived to improve environmental management. To that end, we have established specific performance areas to be achieved, and formulated and published the Fifth Environmental Action Plan as a specific action plan. As a result of our efforts to promote specific strategies as our four "Green" initiatives, we achieved our goals in many areas by FY2014. Nevertheless, we still need to step up our efforts in some areas.

Our highest priority is to once more ensure environmental risk compliance. Over the past several years, serious environmental accidents and legal violations have occurred at our Chinese production sites due to environmental facility deficiencies, some of which caused operations to be suspended and penalties to be imposed. Legal compliance is the basis of all corporate activities. Therefore, we will thoroughly analyze the causes of incidents that have occurred to enhance our compliance system. At the same time, we believe it is necessary to develop personnel who can systematically prevent potential risks.

Also, to further advance Toshiba Group's environmental management, we have formulated an environmental management concept, "T-COMPASS," that we share across our group as a whole.


As Toshiba Group's compass that provides guidelines for our environmental contribution, T-COMPASS defines four domains: responding to climate change and Energy issues (E); expanding the recycling of Natural resources (N); minimizing the amount of Water resources consumed (W); and minimizing the risks posed by chemical Substances (S).

Regarding energy and climate change issues, post-2020 international GHG reduction goals were discussed at COP21 held in Paris in December 2015. Also, the Fifth Report of the Intergovernmental Panel on Climate Change (IPCC) published in FY2014 defines the mitigation of climate change by reducing GHG emissions and adaptation to climate change as the most important strategies. According to the Fifth Report, different adaptation strategies will be needed at the local level. Also, there will be no adaptation strategies for some areas and not all risks can be alleviated. Accordingly, the social cost required for adaptation strategies is likely to be greater than the cost for mitigation strategies. This has led Toshiba Group to place high priority on mitigation, which aims to minimize climate change. Toshiba Group will contribute to reducing global GHG emissions by using our low-carbon technologies, energy-saving products and high-efficiency manufacturing. In addition, we will also contribute to adapting to climate change, including managing risks at our global business and production sites as well as preventing damage from torrential rain by using weather radar and rainwater drainage systems and producing independent hydrogen energy supply systems to prepare for the suspension of infrastructure functions.

In recent years, public attention has also been focused on water resource risks involved in climate change. Business activities in water-stressed regions require not only reducing water consumption, but also careful wastewater quality management as well as collaboration with local communities and residents. It is also known that policies for improving resource efficiency and chemical regulations in Europe have great global impact. We believe it is necessary to create business opportunities and also to exercise global leadership by adopting such international trends.

We are currently reviewing a new environmental action plan for the period from FY2016 to start a new stage of development as the world's foremost eco-company.

## Toward the Achievement of FY2015 Goals

This is the last fiscal year of the Fifth Environmental Action plan. We are working together as a group to achieve all goals for 22 items.

**●Greening of Products**

We aim to achieve the highest level of environmental performance for all products we develop, thereby reducing environmental impact throughout product life cycles. In FY2014, our sales of Excellent ECPs, which achieve the highest level of environmental performance, increased to 2.34 trillion yen, exceeding the FY2015 goal. We will also continue to carry out our initiatives aimed at enhancing total environmental performance, including those for expanding the use of recycled plastics and reducing the use of PVC/BFRs.*

**●Greening by Technology**

By developing low-carbon power sources, we will contribute to providing a stable power supply and mitigating climate change worldwide. In FY2014, the restart of operation of some nuclear power generation facilities was delayed. Consequently, we were unable to achieve our goals regarding reductions in $CO_2$ emissions. Going forward, we will expand the use of renewable energy as well as improve the efficiency of thermal power generation.

**●Greening of Process**

We will improve productivity and also simultaneously implement various measures to reduce environmental impact in order to achieve the world's most efficient manufacturing. In FY2014, we reduced greenhouse gas emissions to 3.02 million tons, greatly exceeding our goals, by implementing a variety of measures, including energy-saving investments and energy-saving diagnosis. In addition, we are making steady efforts toward reducing our environmental impact in different areas, such as amount of waste, total amount of chemical emissions and amount of water received per unit production. Despite these efforts, we were unable to achieve our goal regarding the percentage of final waste disposal. Therefore, we will improve and innovate our manufacturing processes from the perspective of the 3Rs (reuse, reduce and recycle) through activities such as implementing emissions reduction measures at domestic sites and developing know-how overseas.

**●Green Management**

We will strive to strengthen the foundations of our environmental management by developing human resources to carry out environmental initiatives and by improving our environmental management systems on an ongoing basis. Through our biodiversity conservation initiative, we are contributing to the development of ecosystem networks in various regions through the creation of biotopes at our 66 global business and production sites. In addition, we will undertake a wide range of communication activities in order to build relationships of trust with our stakeholders.

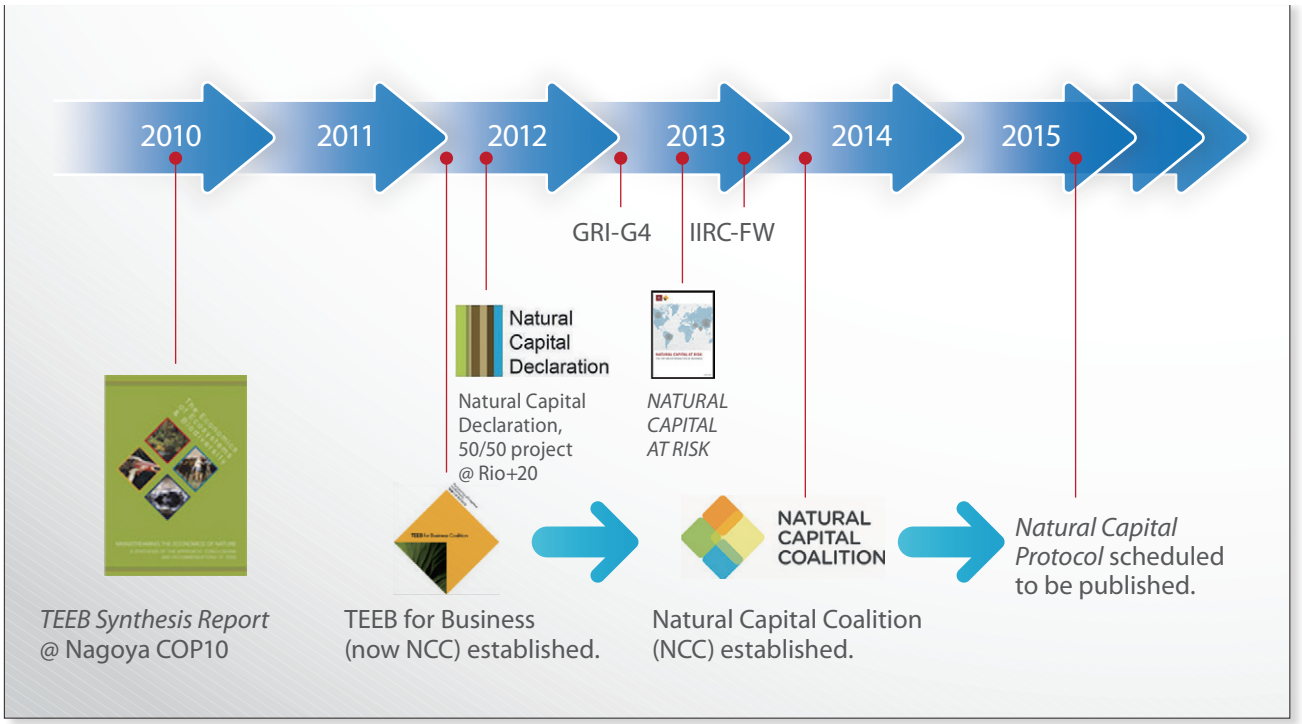
## In Conclusion

The goal envisioned in Environmental Vision 2050, of ensuring that all people can lead affluent lifestyles in harmony with the Earth, cannot be achieved by Toshiba Group alone. It also requires the understanding and support of various stakeholders. All members of Toshiba Group will share our group slogan, "Committed to People, Committed to the Future," once again and work as a group to advance our environmental management. We will not only reduce our own environmental impact, but also contribute to society through providing a wide range of environmentally conscious products and services. It is our sincere desire that we may enjoy your ongoing support.

* PVC / BFR: Polyvinyl Chloride/Brominated Flame Retardants

# Natural Capital Accounting

■ Recent Trends in Discussions on Natural Capital




## Trends in natural capital

In recent years, natural capital accounting, which incorporates the value of natural capital into corporate accounting, has been actively debated.

*The Economics of Ecosystems and Biodiversity* (*TEEB*), which was published in 2010, recommends disclosure of biodiversity information in corporate accounting reports. It also proposes setting "no net loss" and "net positive impact" as targets as well as considering an offset system. Furthermore, *the Natural Capital Declaration: (NCD)* prepared in 2012 by the United Nations Environment Program Finance Initiative (UNEP FI) requires that natural capital, which generates several trillions of dollars annually, be evaluated in the same way as social and financial capital. "The 50/50 Project," which was launched by the World Bank in 2012, also aims to incorporate natural capital into government accounting in 50 countries and corporate accounting at 50 companies.

Moreover, *Natural Capital at Risk*, a report published in 2013 by the TEEB Business Coalition (now the Natural Capital Coalition), proposes that companies evaluate the effects of their operations and supply chain activities on natural capital.

The Natural Capital Coalition is reportedly scheduled to publish the *Natural Capital Protocol* during the period from the end of 2015 to the beginning of 2016 in order to provide evaluation guidance for the food, beverage, and apparel industries.

Meanwhile, *the International Integrated Reporting Framework (FW)* drafted by the International Integrated Reporting Council (IIRC) and *the Sustainability Reporting Guidelines G4* drafted by the Global Reporting Initiative (GRI) were published one after the other in 2013. The IIRC-FW specifies natural capital as one of six capital assets that support corporate activities. In addition, the GRI-G4 recognizes economic assessments of natural capital as an important information disclosure item, requiring companies to implement appropriate measures.

Against this backdrop, Japan's Ministry of the Environment held a public meeting in March 2015 to discuss natural capital accounting. Toshiba personnel attended the meeting. At the meeting, experts in different areas—including scholars, institutional investors, consultants, and business managers—actively exchanged views about the needs, utility, and future of natural capital accounting from their professional perspectives and had lively discussions.

Kazuya Fujieda of the Corporate Environment Management Office presenting a lecture at a public meeting

## Natural capital

Natural capital refers to capital (stock) generated by nature, including forests, soil, water, air, and biological resources. Flows generated from natural capital can be regarded as ecosystem services. According to the definition by Masatsugu Taniguchi, Specially Appointed Professor at Kyoto University's Graduate School of Economics, natural capital exists on earth in the biosphere, geosphere, atmosphere, and ocean. Natural capital includes all entities except artificial objects in these spheres, including forests and fishery resources in the biosphere, minerals and energy resources in the geosphere, air and sunlight in the atmosphere, and currents and tides in the ocean.

Appropriate evaluation of the value of natural capital and wise use will likely increase the sustainability of corporate management.

### ■ Classification of natural capital

| | | |
|---|---|---|
| Natural capital | Biosphere | Ecosystems, biodiversity (animals, plants, fungi, etc.), forests, surface water, soil, climates and landscapes, humans (cultures, traditions, and spirituality) |
| | Geosphere | Minerals, fossil fuels, groundwater |
| | Atmosphere | Air, wind, sunlight |
| | Ocean | Coastal waters, seafloors, currents, and tides |

Compiled based on materials provided by Specially Appointed Professor Taniguchi

## Requirements for corporate natural capital accounting

Stakeholders particularly interested in natural capital include institutional investors mainly in Europe and the United States. An increasing number of investors are beginning to pay attention to business sustainability when making investment decisions, and they are said to be highly interested in how companies disclose corporate information.

To meet these stakeholders' needs, Toshiba Group is reviewing the following four requirements for corporate natural capital accounting.

### ■ Requirements for corporate natural capital accounting

| | |
|---|---|
| (1) | Assessing environmental impacts in terms of physical quantities |
| (2) | Converting physical quantities into monetary values |
| (3) | Assessing environmental impacts across entire supply chains and identifying areas with large impacts as hot spots |
| (4) | Enabling inter-company comparisons |

At present, companies disclose a variety of environmental impact data. Items with particularly great impact on natural capital are greenhouse gas emissions and water usage amounts. However, it is difficult for investors to make investment decisions based on information on physical quantities alone. Therefore, it is necessary to make these values easier to understand by converting them into monetary values. In addition, it is also necessary to enable inter-company comparisons to facilitate selection of companies to invest in, as well as to assess environmental impacts of entire supply chains and to indicate areas with particularly serious impacts on natural capital as hot spots and review measures for improvement, thereby helping to judge business sustainability.

We must recognize that raw material procurement that leads to excessive use of natural capital and inappropriate responses to so-called "hot spots" involves great environmental risk. Based on this recognition, we will strive to reduce negative environmental impacts on natural capital and to promote reuse of resources. At the same time, we will shift toward a form of business management that does not degrade natural capital in order to ensure we maintain our competitive advantage.

Business management actions that do not devalue natural capital include collecting and recycling end-of-life products as well as recycling water at factories. Businesses that use renewable energy generated by sunlight, water, wind and tides as well as businesses that perform desalination of seawater and other water businesses can promote economic activities without damaging natural capital.

In addition, biodiversity conservation activities directly help restore ecosystems.

Toshiba Group's initiatives for natural capital accounting only enable assessment of the amount of water recycled and funds invested in biodiversity conservation activities. We will continue our efforts to quantify accounting items, including effects resulting from biodiversity conservation activities, amounts of electricity produced by photovoltaic power generation, and identification of hot spots in raw material procurement.

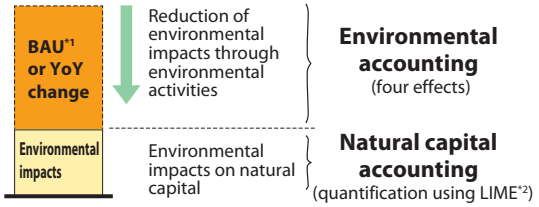
## Environmental Accounting and Natural Capital Accounting

Environmental accounting (for details, see p. 61) aggregates the costs of environmental conservation activities and analyzes the benefits obtained from such activities. Toshiba Group calculates four environmental conservation benefits (actual economic benefits, assumed economic benefits, customer benefits, and risk prevention benefits).

However, environmental impacts associated with business activities cannot be reduced to zero. Viewing these final environmental impacts as "external diseconomies," we can regard environmental accounting as an attempt to measure the costs and benefits involved in various environmental activities in order to minimize such diseconomies. Meanwhile, natural capital accounting is an attempt to "visualize external diseconomies" by converting environmental impacts into monetary values.

Toshiba Group's concept of natural capital accounting can be summarized as shown in the chart below. The chart indicates that reduction of environmental impacts by the environmental activities leads to minimization of effects on natural capital. In the future, we will continue to further raise our level of environmental management by effectively using the two tools of environmental accounting and natural capital accounting.

### ■ Environmental accounting and natural capital accounting




*1 BAU (Business as Usual): Best obtainable value for environmental impacts

*2 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 (AIST).

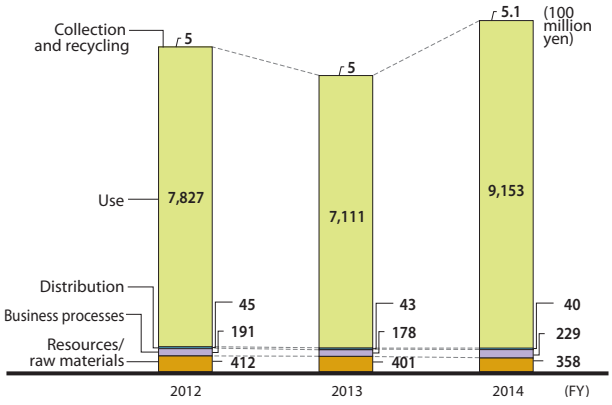
# Natural Capital Accounting

## Integrated assessment of product life cycles, including supply chains

Since FY2009, Toshiba Group has annually published data on environmental impacts throughout entire product life cycles, including supply chains, which we convert into monetary values using one of the leading environmental assessment methods in Japan (LIME: refer to p. 35 for details). Natural capital accounting, which has often been discussed in recent years, requires assessment activities for the upstream of a company's supply chain as well as for the company's own business activities. Toshiba Group is accumulating detailed data on entire product life cycles, including raw materials procurement, research and development, design, manufacture, distribution and sales, use, and collection and recycling.

Results for the period from FY2012 to FY2014 are shown below.

### ■ Integrated assessment of environmental impacts




Data by life cycle stage shows that the environmental impact is most significant during the use of products sold, followed by the procurement of resources and raw materials. To reduce the environmental impact during the use of products, it is important to create products with the highest level of environmental performance, including energy efficiency.

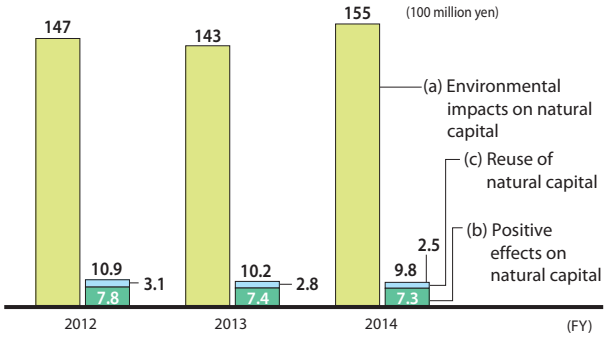
## Impact of group companies' business activities on natural capital

The following graph shows items regarding our group companies' business activities selected from the results of integrated assessment of entire product life cycles. Environmental impacts covered include greenhouse gas emissions, waste and chemical discharges into the air and waters.

The impact on natural capital in FY2014 measured in monetary value increased by 9% from previous year to 15.5 billion yen.

On the other hand, the costs required for biodiversity conservation, factory afforestation, and other initiatives that positively affected natural capital totaled 730 million yen. Furthermore, the results of calculations of business activities that were carried out without using natural capital-for which examples include water reuse and recycling as well as effective use of rainwater at our sites had a worth of 250 million yen in terms of monetary value.

### ■ Comparison between the impact of Toshiba Group's emissions on natural capital, reuse of natural capital, and positive effects on natural capital




(a) Environmental impacts covered
- Greenhouse gases (e.g., $CO_2$, PFC, $SF_6$, and HFC)
- Environmental impacts on atmosphere (factory dust, NOx, and SOx)
- Environmental impacts on hydrosphere (e.g., COD, all nitrogen, and all phosphorus)
- Waste (e.g., metal scraps, cinders, sludge, wastepaper, waste acids, and waste plastics)

* LIME is used to calculate impacts as monetary values. Refer to p. 35 for details of LIME.

(b) Costs covered
- Costs of biodiversity conservation activities
- Nature conservation and afforestation costs
- Donations and financial support associated with environmental protection

(c) Natural capital covered
- Reuse and recycling of water as well as effective use of rainwater

* Calculated using the price of one cubic meter of industrial water

These numbers include monetary values of environmental impacts and the amounts that were actually paid. Therefore, they cannot be simply compared. However, Toshiba Group is considering a system for comparing in an expeditious manner these results to offset or reduce its environmental impacts for natural capital. We found that the reduction rate changed from 7.4% to 7.1% to 6.3% over the three-year period from 2012 to 2014. We believe our analysis will lead to offsetting impacts on natural capital required by TEEB.

In the years to come, the Group will strive to improve the reduction rate by reducing environmental impacts for natural capital through reduction of such impacts and expanding business activities that do not affect (deteriorate) natural capital as well as those that positively affect natural capital.

## Challenges for the future

At present, to quantitatively evaluate the impacts of activities of Toshiba Group and its supply chains on natural capital with respect to the four items chosen as the requirements for natural capital accounting for companies, we use LIME along with physical quantities to convert the impacts into monetary values. Also, in response to requests made mainly by institutional investors, we are considering making inter-company comparisons based on publicly released information (for details, refer to TOPICS on p. 8).

At the same time, we are aware of the great need to analyze and disclose information on local differences in environmental impacts. We will work to improve the accuracy of such analysis and continue to make improvements.

Discussions of natural capital accounting have only recently begun. We expect that more lively discussions will take place worldwide in the future as various case studies are conducted.

## TOPICS Toward Inter-company Comparisons of Natural Capital Accounting

The results of the aforementioned natural capital accounting analysis depict various environmental effects that we estimated using LIME, a specialized LCA tool. However, investors and other stakeholders are likely to find it difficult to use this method to compare companies.

Therefore, here we present an example of an inter-company comparison using public data. The information on physical quantities used in the following comparison is company data disclosed in CDP and CDP's water program. Using the trade unit prices of the European Union Emission Trading Scheme (EU-ETS) and the average unit prices of industrial water in relevant countries as conversion coefficients provides a simple means of calculating the impact on natural capital.

The average price of emission rights under the EU-ETS during the 2012-2014 period was approximately 6 euros/t-$CO_2$. Therefore, we used 6 euros/t-$CO_2$ as the conversion coefficient for $CO_2$.

To estimate the monetary value of water, we calculated an average from the prices of industrial water in the relevant countries and obtained approximately 30 yen/$m^3$. The CDP water program shows amounts of water in liters, so we used 0.03 yen/L as the conversion coefficient for water.*

We analyzed trends during the past three years based on CDP data and trends for the past two years based on CDP water data. The table below shows the CDP and CDP water data Toshiba Group has registered along with hypothetical data for companies chosen for comparison. CDP and CDP water data are calculated and registered by individual companies at their own initiative. Therefore, data on a given item is not always available for all companies. Consequently, it is not possible to simply compare the totals. Nevertheless, these databases provide the richest available data on companies' environmental impacts, so we use these numbers.

* The purpose of this demonstration is to calculate common coefficients to compare companies in terms of natural capital accounting, not to calculate probabilities regarding the economic value of $CO_2$ and water.

### ■ CDP data

(Unit: 1,000 t-$CO_2$)

| | Toshiba | | | Company A | | | Company B | | |
|---|---|---|---|---|---|---|---|---|---|
| FY | 2014 | 2013 | 2012 | 2014 | 2013 | 2012 | 2014 | 2013 | 2012 |
| Assessment: Disclosure/performance | 100/A | 98/A | 88/C | 98/A | 99/B | 85/C | 97/B | 92/B | 85/C |
| Purchased goods and services | 7,000 | 6,580 | 7,420 | 15,900 | 15,121 | | | | |
| Capital goods | 780 | 570 | 748 | 1,070 | 1,210 | | | | |
| Fuel-and-energy-related activities (not included in Scope 1 or 2) | 16 | 200 | 170 | 410 | 329 | | 203 | 985 | |
| Upstream transportation and distribution | 500 | 5,000 | 6 | 892 | 1,370 | | 540 | 229 | 334 |
| Waste generated in operations | 27 | 35 | 41 | 183 | 181 | | 137 | 79 | |
| Business travel | 66 | 59 | 51 | 240 | 332 | | | | |
| Employee commuting | 8 | 8 | | 431 | 469 | 200 | | | |
| Upstream leased assets | | | | | | | | | |
| Downstream transportation and distribution | 14 | 980 | 54 | 786 | 628 | | 302 | 294 | 280 |
| Processing of sold products | | | | 10 | 7 | | 948 | 697 | |
| Use of sold products | 52,950 | 58,300 | 80,510 | 119,762 | 163,857 | | 109,430 | | |
| End of life treatment of sold products | 92 | 81 | | 370 | 462 | | 4,540 | 3,780 | |
| Leased assets (Downstream) | | | | 399 | 319 | | | | |
| Franchises | | | | | | | 306 | 178 | |
| Investments | | | | | | | 986 | 698 | |
| Other (upstream) | | | | | | | | | |
| Other (downstream) | | | | | | | | | |
| Total | 61,453 | 71,812 | 89,000 | 140,453 | 184,285 | 200 | 117,392 | 6,940 | 614 |

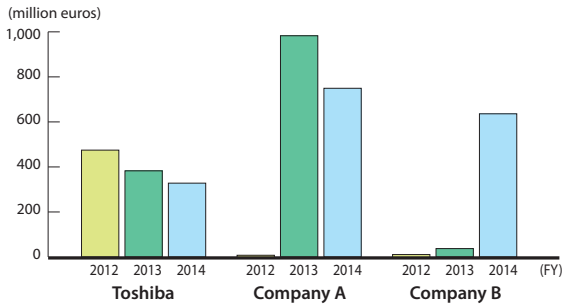
### ■ CDP water data

(Unit: 1,000L)

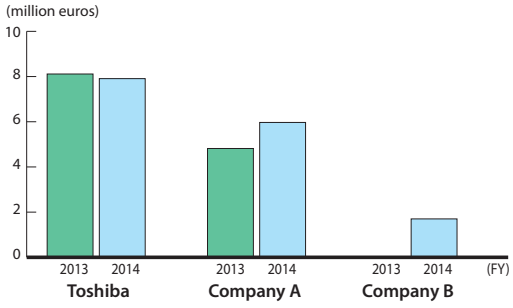
| | Toshiba | | Company A | | Company B | |
|---|---|---|---|---|---|---|
| FY | 2014 | 2013 | 2014 | 2013 | 2014 | 2013 |
| Total volume of water withdrawn | 39,539,000 | 40,563,000 | 28,845,000 | 20,081,000 | 7,903,000 | No answer |
| Total volume of water discharged | 32,149,000 | | 1,103,000 | 948,100 | | |
| Total volume of water consumed | 7,390,000 | | | | | |
| Total volume of recycled water used | 14,088,000 | 15,369,000 | | | | |

The following graphs show the monetary amounts obtained by multiplying these physical quantities by the conversion coefficients for $CO_2$ and water. Impacts on natural capital vary depending on the type of industry and company size. In natural capital accounting, we think it is more important to compare trends over a medium- or long-term period (three or five years) rather than single-year figures. We hope to create a system to evaluate companies that are working to reduce impacts on natural capital based on long-term trends.

### ■ Example of an inter-company comparison based on $CO_2$ emissions measured in monetary amounts




### ■ Example of an inter-company comparison based on water consumption measured in monetary amounts



# Conservation of Biodiversity

Toshiba Group is carrying out biodiversity conservation activities at 66 business and production sites worldwide. We have confirmed that more than 100 rare species inhabit these sites, where we are developing activities to protect these species.

## Over 100 rare species inhabit our sites

Toshiba Group is developing biodiversity conservation activities at 66 business and production sites worldwide. First, during the two-year period from 2012 to 2013, we conducted ecosystem surveys on and around our business and production sites. We actively take measures to protect rare animal and plant species found within our sites. On the premises of the sites, Toshiba Group also promotes ex-situ conservation (Article 9 of the Convention on Biological Diversity)* in order to protect and artificially breed (inside the sites) rare flora and fauna which inhabit the surrounding areas before returning them to their original habitats.

As a result of these activities, at present more than 100 rare species inhabit Toshiba Group's business and production sites.

* Measures taken to recover and rehabilitate threatened species and reintroduce them into their original habitats under appropriate conditions as well as measures taken to complement in-situ measures (as stipulated in Article 8 of the Convention) aiming to conserve such threatened species within their original habitats

## Significance of promoting ex-situ conservation on our site premises

Compared to parks and forests, where government organizations and NPOs promote initiatives to protect rare species, corporate production sites are better insulated from excessive picking or hunting by third parties thanks to more effective security measures; such sites also are at lower risk of feeding damage due to natural predators or invasive alien species. Therefore, corporate sites share the characteristics of strict nature preserves.

We recognize the effects of our land use on ecosystems. At the same time, as part of efforts to protect the diversity of rare species through our new ecosystem conservation initiatives, we will continue to make use of the characteristics of our business and production sites having large areas of land.

### ■ Major rare species protected by Toshiba Group*

A: Plants B: Birds C: Reptiles and amphibians D: Fish E: Insects F: Mammals

| | Species name | Site |
|---|---|---|
| A1 | Kapa-Kapa (Medinilla magnifica) | Toshiba Information Equipment (Philippines), Inc. |
| A2 | Solomon's seal | Fuchu Complex |
| A3 | Purple-fringed riccia | Toshiba Medical Systems Corporation |
| A4 | Japanese gentian | Toshiba Carrier Corporation Tsuyama Factory |
| A5 | Leucaena | Toshiba Information Equipment (Philippines), Inc. |
| A6 | Birthwort | Hamakawasaki Operations |
| A7 | Toadflax | Imabari Complex |
| A8 | Oochigoyuri (Disporum viridescens) | Kanuma Works |
| A9 | Oonigana (Prenanthes tanakae) | Kaga Toshiba Electronics Corporation |
| A10 | Kazaguruma (Clematis patens) | Toshiba Lifestyle Products & Services Corporation Aichi Operations |
| A11 | Horned maple | Kaga Toshiba Electronics Corporation |
| A12 | Kawajisha (Veronica undulata) | Toshiba Corporation Yokohama Complex |
| A13 | *Kinran* orchid (*Cephalanthera falcata*) | Numazu Complex |
| A14 | *Ginran* orchid (*Cephalanthera erecta*) | Numazu Complex |
| A15 | *Kugenumaran* orchid (*Cephalanthera longifolia*) | Toshiba Corporation Yokohama Complex |
| A16 | *Kumokiriso* plant (*Liparis kumokiri*) | Toshiba Medical Systems Corporation |
| A17 | Japanese yew | Toshiba HA Manufacturing (Nanhai) Co., Ltd. |
| A18 | Kogama (Typha angustifolia) | Toshiba Carrier Corporation Tsuyama Factory |
| A19 | Primrose | Iwate Toshiba Electronics Co., Ltd. |
| A20 | Sakuratade (Persicaria conspicua) | Toshiba Carrier Corporation Tsuyama Factory |
| A21 | Japanese alder | Toshiba Lifestyle Products & Services Corporation Aichi Operations |
| A22 | Macranthum azalea | Uenohara Complex |
| A23 | Star magnolia | Toshiba Lifestyle Products & Services Corporation Aichi Operations |
| A24 | *Shimajitamuraso* plant (*Salvia isensis*) | Toshiba Lifestyle Products & Services Corporation Aichi Operations |
| A25 | Riverstream orchid (Cymbidium goeringii) | Toshiba Medical Systems Corporation, Toshiba Teli Corporation, etc. |
| A26 | Hyacinth orchid (Bletilla striata) | Fuji Complex |
| A27 | White lauan | Toshiba Information Equipment (Philippines), Inc. |
| A28 | Swirlkechick | P.T. Toshiba Consumer Products Indonesia |
| A29 | *Setsubunso* plant (*Shidateranthis pinnatifid*) | Kanuma Works |
| A30 | *Takonoashi* plant (Penthorum chinense) | Toshiba Corporation Yokohama Complex |
| A31 | *Tashiroran* orchid (*Epipogium roseum*) | Numazu Complex |
| A32 | *Tedoridokusa* plant (*Equisetum x moorei*) | Kaga Toshiba Electronics Corporation |
| A33 | Water clover | Imabari Complex |
| A34 | Evergreen witchhazel | Fuji Complex |
| A35 | Frogbit | Imabari Complex |
| A36 | Oak | Toshiba Information Equipment (Philippines), Inc. |
| A37 | Nojiigiku (Chrysanthemum japonense) | Toshiba Elevator Products Corporation and others |
| A38 | Japanese iris (Iris ensata) | Oita Operations |
| A39 | *Hamakakiran* orchid (*Epipactis papillosa var. sayekiana*) | Toshiba Corporation Yokohama Complex |
| A40 | Hamakanzo (Hemerocallis fulva var.littorea) | Yokosuka Complex |
| A41 | Higeshiba (Sporobolus japonicus) | Kanuma Works |
| A42 | Himeshaga (Iris gracilipes) | Fuji Complex |
| A43 | Southern adderstongue | Fuchu Complex |
| A44 | Thoroughwort | Himeji Complex |
| A45 | Mongolian oak | Toshiba Lifestyle Products & Services Corporation Aichi Operations |
| A46 | Spotted bellflower | Oita Operations |
| A47 | Bradford pear (Pyrus calleryana) | Toshiba Lifestyle Products & Services Corporation Aichi Operations |
| A48 | *Mikekado* pumpkin | Buzen Toshiba Electronics Corporation |
| A49 | Mishimasaiko (Bupleurum scorzonerifolium) | Shizuoka Business Center |
| A50 | Jade bee orchid | Toshiba Lighting & Technology (Kunshan) Co., Ltd. |
| A51 | Shrub-althea | Shenzhen Shenzhi Precision Parts Co., Ltd. |
| A52 | Taiwan cow-tail fir | Dongwink Technology (Huizhou) Ltd. |
| B53 | Black-faced bunting | Toshiba Corporation Yokohama Complex |
| B54 | Long-tailed bushtit | Fuchu Complex |
| B55 | Common kingfisher | Toshiba Corporation Yokohama Complex |
| B56 | Oriental greenfinch | Toshiba Corporation Yokohama Complex |
| B57 | Grey-headed lapwing | Toshiba Medical Systems Corporation |
| B58 | Grey-faced buzzard | Toshiba Medical Systems Corporation and others |
| B59 | Japanese wagtail | Fuchu Complex |
| B60 | Chattering cisticola | Toshiba Corporation Yokohama Complex |
| B61 | Common kestrel | Toshiba Medical Systems Corporation |
| B62 | Common buzzard | Toshiba Corporation Yokohama Complex |
| B63 | Peregrine falcon | Toshiba Elevator (China) Co., Ltd. |
| B64 | Lark | Toshiba Corporation Yokohama Complex, etc. |
| B65 | Shrike | Fuchu Complex |
| C66 | Japanese rat snake | Toshiba Corporation Yokohama Complex, etc. |
| C67 | Japanese striped snake | Toshiba Medical Systems Corporation |
| C68 | Tokyo *daruma* pond frog | Toshiba Medical Systems Corporation |
| C69 | Japanese brown frog | Toshiba Medical Systems Corporation |
| C70 | Japanese grass lizard | Toshiba Medical Systems Corporation and others |
| C71 | Japanese five-lined skink | Toshiba Medical Systems Corporation |
| C72 | East Japan five-lined skink | Fuchu Complex |
| C73 | Northern crested newt | SPRINGFIELDS FUELS LTD. |
| C74 | Tiger keelback | Toshiba Medical Systems Corporation |
| D75 | Ezo salamander | Tohoku Hokuto Electronics Corporation |
| D76 | Golden venus chub | Toshiba Corp. Himeji Operations-Semiconductor |
| D77 | Japanese eight-barbel loach | Komukai Complex |
| D78 | Killifish | Mie Operations, Ome Complex |
| E79 | Oriental hairstreak | Toshiba Medical Systems Corporation |
| E80 | Great purple emperor | Toshiba Medical Systems Corporation |
| E81 | Owl fly (*Ascalaphus ramburi*) | Toshiba Medical Systems Corporation |
| E82 | Japanese Luedorfia butterfly | Toshiba Lifestyle Products & Services Corporation Aichi Operations |
| E83 | Chinese windmill | Nishishiba Electric Co., Ltd. |
| E84 | Shouryoubatta modoki (Gonista bicolor) | Fuchu Complex |
| E85 | Butterfly skimmer | Keihin Product Operations |
| E86 | Nokogiri kamikiri (Prionus insularis insularis) | Fuchu Complex |
| E87 | Flower chafer (Amphicoma pectinata) | Fuchu Complex |
| E88 | Spotted alga beetle (Haliplus sharpi) | Toshiba Carrier Corporation Tsuyama Factory |
| E89 | Squirrel darter (Sympetrum risi risi) | Toshiba Corporation Yokohama Complex |
| F90 | Common pipistrelle | SPRINGFIELDS FUELS LTD. |

* Definition of rarity: A species specified by the International Union for Conservation of Nature (IUCN), a species listed in the Red Lists of various countries and regions, or a species so designated by experts

## Japanese Luedorfia butterfly

Toshiba Lifestyle Products & Services Aichi Operations

At Toshiba Lifestyle Products & Services Corporation Aichi Operations, we have been conducting ecosystem surveys on-site since 2014. These surveys revealed Japanese Luedorfia butterflies on the Aichi Operations premises.



Japanese Luedorfia butterfly (adult) found on the Aichi Operations premises

Japanese Luedorfia butterflies inhabit Japan's mountains and forests. In recent years, however, due to the abandonment and development of mountains, their numbers have been decreasing, and they are designated as a vulnerable species in the Ministry of the Environment's RDB and in Aichi Prefecture's RDB.

They are rarely seen in flatlands or urban areas; it is especially rare for them to inhabit a company's site. *Kan-aoi* plants, which they feed on, grow naturally on the factory premises, where we find Japanese Luedorfia adult butterflies, along with many eggs and larvae, each year. To conserve the habitats of Japanese Luedorfia butterflies, we periodically cut down bamboo shoots and shrubs, thereby providing flying space for the butterflies and helping *kan-aoi* plants to grow.


Japanese Luedorfia butterfly eggs


Japanese Luedorfia butterfly larva


*Kan-aoi* plant, which Japanese Luedorfia butterflies feed on


Ecosystem survey

### ■ Other rare species discovered on the premises of Aichi Operations


Japanese alder
Designated as a near-threatened species in the Ministry of the Environment RDB


Star magnolia
Designated as a near-threatened species in the Ministry of the Environment RDB
Designated as a vulnerable species in the Aichi Prefecture RDB


Clematis
Designated as a near-threatened species in the Ministry of the Environment RDB
Endangered species (Aichi Prefecture RDB)


*Shimajitamuraso* plant (*Salvia isensis*)
Vulnerable species (Ministry of the Environment RDB)
Near-threatened species (Aichi Prefecture RDB)

## *Kinran* (*Cephalanthera falcata*)

Toshiba Corp. Yokohama Complex

Despite its location on artificially reclaimed land, many *kinran* (*Cephalanthera falcata*) orchids grow on the premises of Toshiba Corporation Yokohama Complex. *Kinran* orchids were first discovered here in 2008, and full-scale conservation activities began in 2013.



*Kinran* orchid growing on the premises of Yokohama Complex

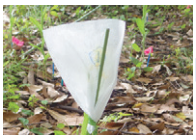
*Kinran* orchids used to be a common sight in Japanese woods. However, due to the abandonment of forests and excessive picking of plants resulting from a wildflower boom, the number of individual plants has been decreasing. The *kinran* orchid is now designated as a vulnerable species in the Ministry of the Environment's Red Data Book (RDB) as well as Kanagawa Prefecture's RDB.

Many orchid species find it difficult to grow with only the nutrition they can acquire themselves; they need the help of orchid fungi to absorb nutritive salts. For this reason, when breeding orchids, it is effective to sow seeds in locations confirmed to have orchid fungi. Sowing seeds require a large number of seeds. The problem, however, is that under natural conditions, the chance of securing seeds is extremely low.

Therefore, at Yokohama Complex, staff members are working to collect seeds by artificial insemination and to conduct orchid fungus habitat surveys and germination experiments by sowing seeds with the help of experts in order to protect and propagate *kinran* orchids.

**<Artificial insemination experiment>**

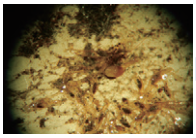

Artificial insemination

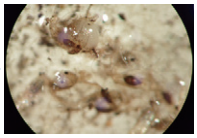

Protective bag


Seeds taken from fruits

**<Seed sowing experiment>**


Stage 1: Embryo growth


Stage 2: Germination


Stage 3: Protocorm growth

**Stages before *kinran* orchid seed germination**

| Stage 1 Embryo growth | Stage 2 Germination | Stage 3 Protocorm growth* | Stage 4 Rhizoid formation | Stage 5 Bud/root formation |
|---|---|---|---|---|

At Yokohama Complex, we confirmed growth up to stage 3 and verified the presence of orchid fungi.

* Protocorm: A ball-like cell mass formed by orchid seed embryos as they grow and differentiate by using nutritive salt supplies from symbiotic fungi (orchid fungi)

**<Results>**

| Result | FY2013 | FY2014 |
|---|---|---|
| Artificial insemination | Approx. 20,000 seeds | Approx. 200,000 seeds |
| Orchid fungi habitat survey | 12 spots | 60 spots |

In the future, we will work to grow orchids from seeds in places where we have confirmed the presence of orchid fungi. It may take more than ten years for the plants to bloom, but we will continue our activities with a view to maintaining their natural habitat forever.

# Conservation of Biodiversity

## Golden venus chub　Toshiba Corp. Himeji Operations-Semiconductor

Toshiba Corp. Himeji Operations-Semiconductor has been working to protect golden venus chubs since 2013.


Golden venus chub


Reservoir on the Himeji Operations-Semiconductor premises

Golden venus chubs are already extinct in the Ibo River system in the factory's vicinity, though some individual organisms are protected in the Himeji City Aquarium. They are designated as an endangered species in the Ministry of the Environment's RDB and are ranked A in Hyogo Prefecture's RDB (equivalent to a critically endangered or endangered species in the Ministry of the Environment's RDB).
The Himeji City Aquarium was searching for a new protected area to distribute extinction risks and released 26 golden venus chubs into a pond on the Himeji Operations-Semiconductor premises in June 2013.


Protection started on the factory premises (June 2013)


The number of organisms increased by approximately 29 times (April 2014).

A survey conducted in April 2014 confirmed that the number of golden venus chubs had increased to more than 700. In May 2014, under the guidance of the Himeji City Aquarium, we released 200 chubs into the Ibo River system, their original habitat. Subsequent monitoring surveys have confirmed their presence. We will continue to conduct monitoring surveys to restore species into the wild.


Released to their original habitat (May 2014)


Chubs donated to an elementary school in the vicinity (June 2015)

In June 2015, we donated 60 golden venus chubs to a pond in an elementary school in the vicinity. Toshiba Group's biodiversity conservation activities aim to support children's learning about the environment as well as to distribute extinction risks.
We will continue to collaborate with a wide range of stakeholders in order to expand environmental conservation sites as well as to promote local communication activities.

## Northern crested newt　Springfields Fuels Ltd. (UK)

In 2006, Springfields Fuels Ltd. in the United Kingdom obtained a Biodiversity Benchmark, which is awarded to business sites certified by the Wildlife Trusts, an international NGO, for its consideration of biodiversity. In the pond on the company's premises, two newt species have been found, one of which is the northern crested newt (designated as a European Protected Species). The company is developing a pond that is friendly to nature's creatures.


Northern crested newt


Protected in a pond on the company premises

In April 2015, company staff members held a nature observation event with children in the community and confirmed the presence of 11 newts, including 9 northern crested newts, along with a variety of other animals. In previous surveys, only one or two newts had been observed. This suggests the possibility that newts are breeding in the pond. We will strive to conserve the pond environment as a habitat for facilitating animal diversity, including that of northern crested newts.
Also, birdhouses have been installed on the company premises to protect pipistrelles, a European protected species, that also inhabit the premises.


Pipistrelle birdhouse

## TOPICS　Winning the Committee's Award at the 2014 Biodiversity Action Awards Japan

Toshiba Group's biodiversity conservation activities were awarded the Committee's Award at the 2014 Biodiversity Action Awards Japan.
The Biodiversity Action Awards Japan are sponsored by the Japan Committee for the United Nations Decade on Biodiversity (UNDB-J), with CEPA Japan serving as secretariat. The award was established in 2013 for the purpose of commending groups and individuals that are working to conserve biodiversity as well as to mainstream biodiversity in Japan and achieving the Aichi targets.
A total of 15 groups, including NPOs and schools, received Biodiversity Action Awards in 2014. Toshiba Group was the only company to earn an award.

Awards ceremony

Certificate

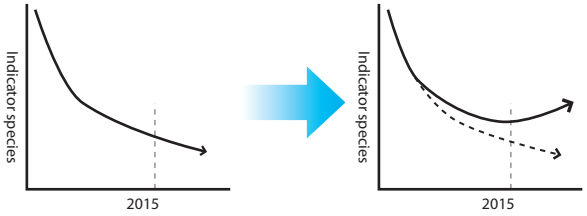
# Medium-term Plan for the Conservation of Biodiversity

## 2015 target

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.

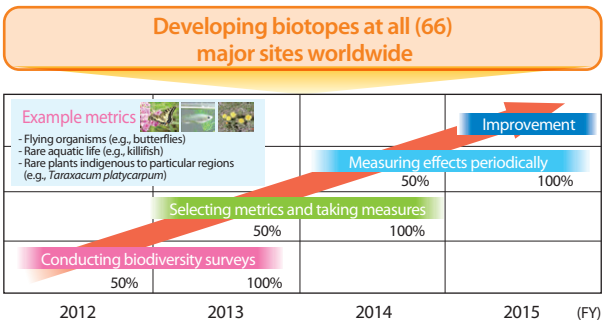
These efforts aim to stop the decreases in the kinds of biodiversity that each site has decided to protect by 2015 and allow for such biodiversity to increase in subsequent years.

### ■ Minimizing Adverse Effects and Increasing Biodiversity (Conceptual Diagram)




## Medium-term plan for the period up to 2015

To achieve the 2015 target, Toshiba Group aims to develop biotopes at 66 of its business and production sites worldwide.




Development of biotopes will be promoted in three steps: biodiversity surveys, selection of metrics and measurement of effects. Biodiversity surveys consist of investigations of living organisms and "red lists" in the environs of our sites, explorations of biodiversity by experts, and assessments of biodiversity potential at such sites and in neighboring areas.

Based on this survey data, Toshiba Group will select living organisms to serve as metrics, take measures to protect and increase them, and make periodic measurements of effects, thereby verifying the appropriateness of the biotope development process. Under the medium-term plan, the Group will take these steps at a minimum of 33 of its sites (50%) each year.

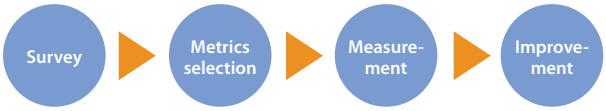
Incorporating these three steps into the medium-term plan enables implementation of PDCA cycles by individual sites as well as by the Group as a whole. In the future, we will make efforts to satisfy ISO 14001:2015.

### ■ Medium-term plan

| FY2012 | FY2013 | FY2014 | FY2015 |
|---|---|---|---|
| 50% of sites surveyed | Percentage of sites where surveys were conducted 100%<br>Percentage of sites for which indicators were selected 50% | Percentage of sites for which indicators were selected 100%<br>50% of sites have measured effects | 100% of sites have measured effects |

*50%: 33 sites or more

### ■ Steps in biotope development




| | |
|---|---|
| Survey | Investigate organisms living on the premises; investigate IUCN and local area Red Lists; onsite inspection by local experts; assessment of biodiversity potential for targeted and neighboring areas. |
| Metrics selection | Select relevant metrics on the basis of investigation data; devise measures to protect and expand the selected metrics. |
| Measure-ment | Measure the metrics on a periodic basis. Examples of measurement targets: Number of species of animals, number of animals within each species, number of plant roots, size of planting area. |
| Improve-ment | Improvement or enhancement in metrics achieved as a result of periodic measuring. |

## Results for FY2014

In FY2014, metrics were selected at 100% of the 66 sites targeted (100% planned), and 67% (50% planned) have measured effects.

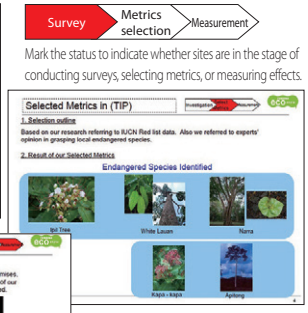
We aim to raise the percentage of sites that have measured effects to 100% during FY2015.

| Region | Eligible sites | % of sites where metrics have been selected | No. of sites where effects have been measured | % of sites where effects have been measured |
|---|---|---|---|---|
| Japan | 45 | 100% | 29 | 64% |
| China | 11 | | 6 | 55% |
| Asia | 6 | | 5 | 83% |
| Americas | 2 | | 2 | 100% |
| Europe | 2 | | 2 | 100% |
| Total | 66 | 100% | 44 | 67% |

## Development of a Biodiversity Conservation Database

We have created a biodiversity conservation database containing data from the 66 sites targeted by the Fifth Environmental Action Plan in order to share information among all group companies. We use the same format globally so that we can share information about progress and activities in three stages (survey, metrics selection and measurement) at individual sites.

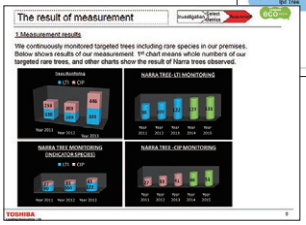
Survey




Mark the status to indicate whether sites are in the stage of conducting surveys, selecting metrics, or measuring effects.




Metrics selection




Measurement

# Toward the Realization of 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.

INDEX

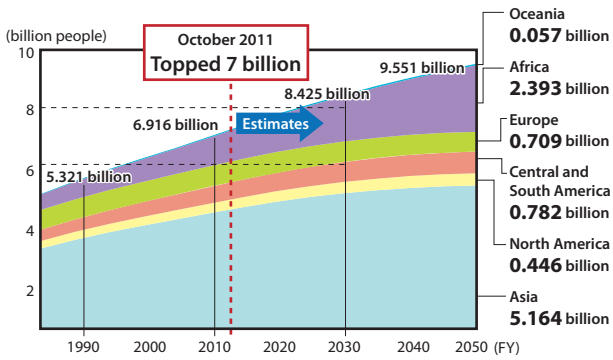
## Summary of activities in FY2014



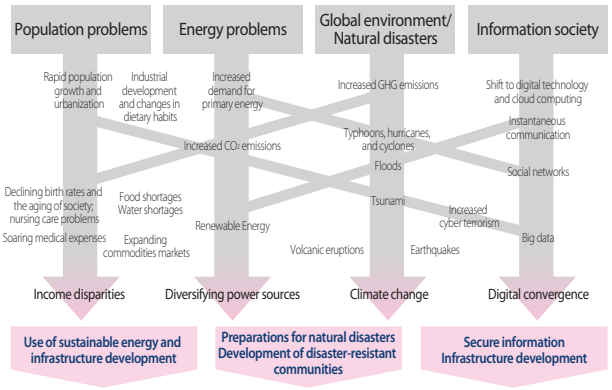
## Environmental Vision 2050

The world population topped seven billion in October 2011, and rapid population growth and the urbanization of populations are expected to continue to occur mainly in the emerging countries of Africa, Asia and other regions. As a result, food, water, and energy shortages; decreases in the consumable resources such as fossil fuels, metals, and minerals that support today's society; climate change; and other problems are having global effects as a result of their complicated, intricate relations with one another. We must address these issues urgently.
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.

### ■ Changes in the World Population (Estimates)



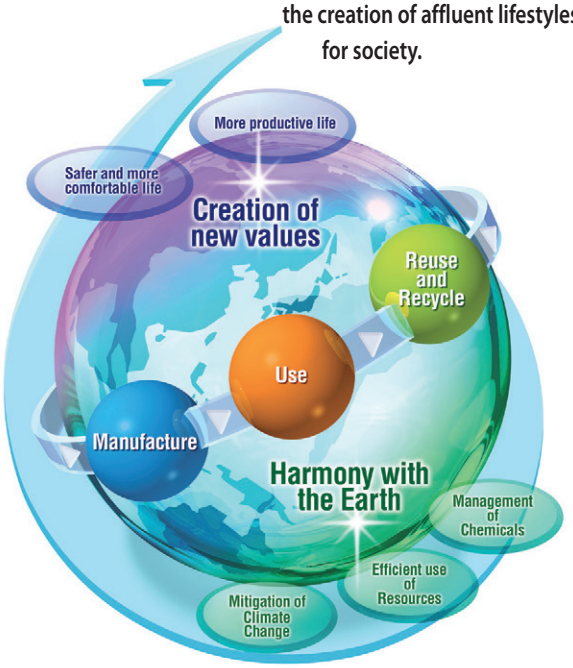

### ■ Mega-trends in Environmental Changes



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.

## Environmental Vision 2050

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




## 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.

**Factor**

**Degree of improvement in eco-efficiency**

$$\text{Value} = \frac{\text{Environmental impacts}}{}$$

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. And at the 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 10.2 (3.4 × 1.5 × 2). Toshiba Group Environmental Vision 2050 requires that the Group globally achieve Factor 10 by 2050. In consideration of the above, a long-term goal has been set by backcasting from the ideal situation in 2050. (See the graph below.)

At the same time, for FY2015, the final year of the Fifth Environmental Action Plan which began in FY2012, achieving Factor 3.0 has been set as a stretch goal based on current initiatives through forecasting.

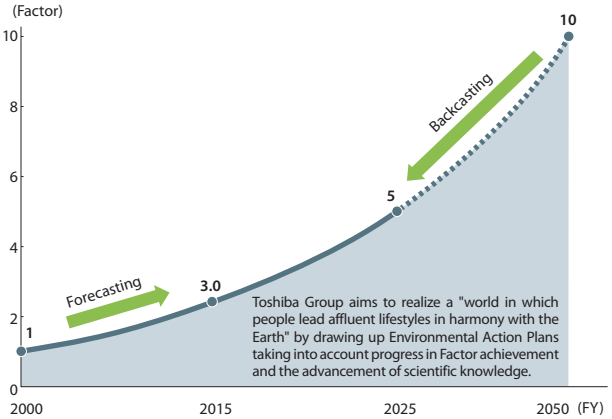
### Achieving Factor 10 in 2050

**Ideal situation in 2050** (affluent lifestyles in harmony with the Earth)

**Issues to address to realize the vision**

| | |
|---|---|
| Accelerated economic development (esp. in developing countries) | Increase value creation by 3.4 times |
| Increasing population growth | Reduce environmental impacts due to overpopulation to 1/1.5 |
| Target: cut $CO_2$ emissions 50% to mitigate climate change | Reduce global environmental impacts by 1/2 |

**<Environmental Vision 2050> Factor 10 (3.4 × 1.5 × 2)**




**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 3.0 in FY2015, the target year of the Fifth Environmental Action Plan.

# Toward the Establishment of a Position as the World's Foremost Eco-company

**Toshiba aims to become the world's foremost eco-company based on the Environmental Grand Design and T-COMPASS, a concept of environmental management.**

## We establish performance areas that should be achieved and endeavor to integrate business management and environmental management through the four strategies.

Toshiba Group has formulated the Environmental Grand Design to establish its position as the world's foremost eco-company in FY2015. This Grand Design consists of six performance areas that should be achieved by FY2015 and four environmental strategies toward this end.

First, under the strategy to expand ECPs*, we are promoting the sale of products having the highest level of environmental performance (Excellent ECPs) to contribute to building sustainable societies globally.

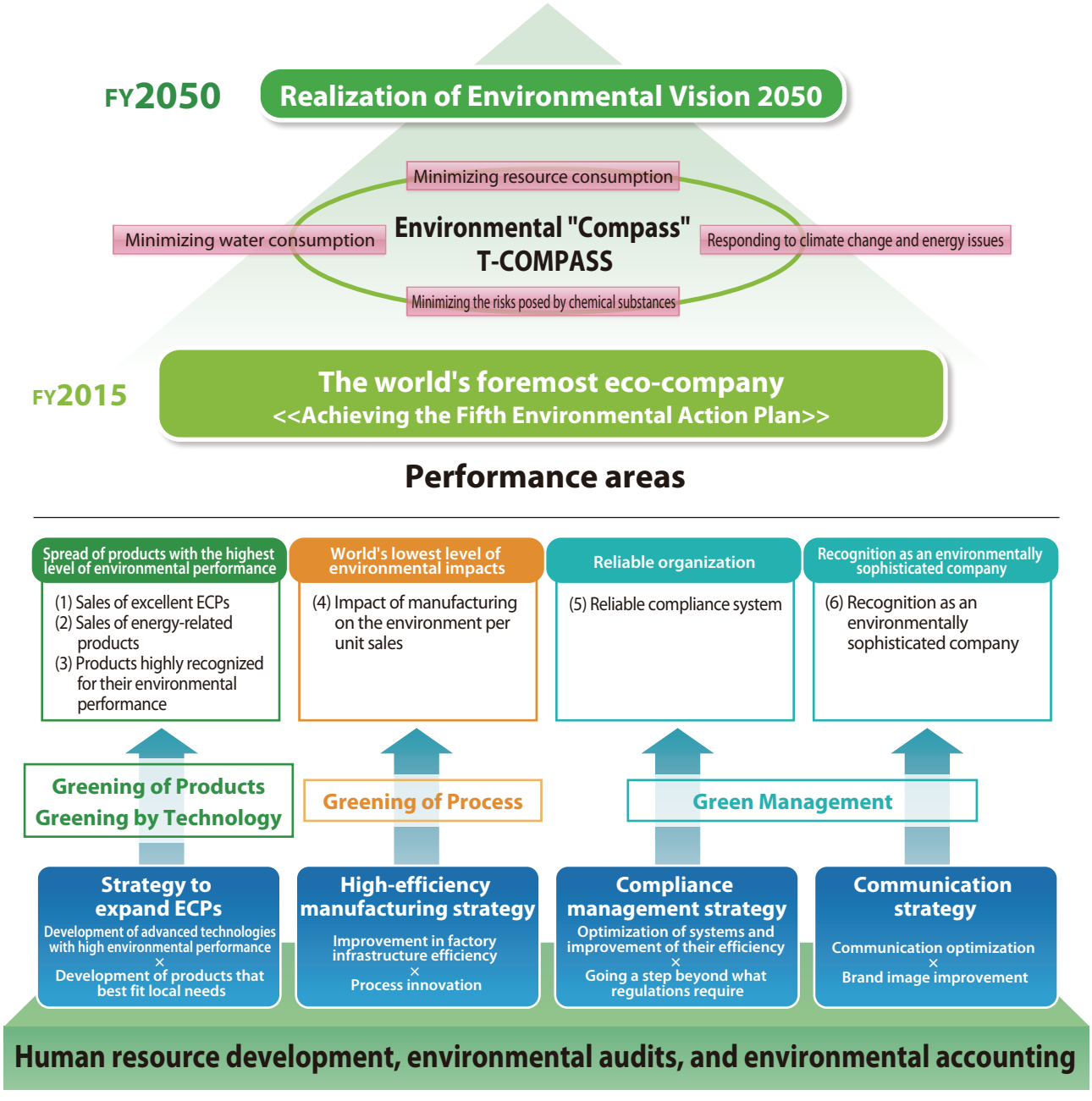
Second, under the high-efficiency manufacturing strategy, we are striving to realize manufacturing having the world's lowest level of environmental impacts.

Third, under the compliance and management strategy, we are promoting the development of a reliable organization to strengthen the foundation of our environmental management.

Fourth, through our communication strategy we are striving to increase the visibility of Toshiba as an environmentally sophisticated company.

In addition, to prepare for the future, we have introduced T-COMPASS, a concept of environmental management. With this concept, we will achieve greater integration of business management and environmental management by focusing on our supply chain and multiple environmental areas (multiple criteria) in accordance with new global trends.

ECPs: Environmentally Conscious Products



## Stepping up environmental management by introducing product sales management and total environmental impact controls

Toshiba Group is implementing the Fifth Environmental Action Plan to develop specific actions based on the four strategies. More specifically, we are implementing four "Green" initiatives: Greening of Products, Greening by Technology, Greening of Process and Green Management. In order to achieve great integration of business management and environmental management, we have established specific goals to achieve continuous business growth and reduce environmental impacts; we are now taking action to attain these goals.

**●Greening of Products**

The Greening of Products initiative aims to create products having the highest level of environmental performance. Under this initiative, we manage products' environmental performance using performance indicators such as sales of products, reductions in product-derived $CO_2$ emissions, the percentage of recycled plastics used, and reductions in the use of specified chemical substances. We will strive to increase sales of excellent ECPs to 1.8 trillion yen in FY2015, approximately six-fold compared to the FY2011 level, and to reduce $CO_2$ emissions by 15 million tons.

**●Greening by Technology**

The Greening by Technology initiative aims to expand the application of advanced low-carbon technologies globally in order to contribute to providing a stable power supply and mitigating climate change. Under this initiative, we manage environmental performance through performance indicators such as sales and reductions in $CO_2$ emissions. In FY2015, Toshiba Group will increase sales of energy-related products concerning various types of power generation (e.g., thermal and wind power) to 1.9 trillion yen, about 1.5 times the FY2011 level, and also reduce $CO_2$ emissions by 490 million tons.

**●Greening of Process**

The Greening of Process initiative aims to realize high-efficiency manufacturing. Under this initiative, we manage performance indicators on both "per unit production" and "total volume" basis. In FY2015, we aim to achieve the world's lowest level of environmental impacts through high-efficiency manufacturing, in which we simultaneously reduce costs and environmental impacts (greenhouse gases, waste materials, chemical substances, wastewater discharged from production sites, etc.).

**●Green Management**

The Green Management initiative aims to continuously improve the foundation of our environmental management, such as developing the human resources that lead our environmental initiatives, upgrading our environmental management, and promoting better environmental communication. Under this initiative, we focus on three performance indicators: conservation of biodiversity, environmental education and human resource development, and environmental communication.

Through these initiatives, Toshiba aims to establish its position as one of the world's foremost eco-companies by FY2015 by achieving greater integration between business management and environmental management.

## Implementing various measures based on the four "Green" concepts

### Greening of Products

**Create products having the highest level of environmental performance**

Aiming to achieve the highest level of environmental performance for all products we develop and thus reduce environmental impacts throughout product life cycles

Goal Increase sales of excellent ECPs to 1.8 trillion yen (FY2015).

Enefarm, a fuel cell for home use

dynabook R82, a detachable PC

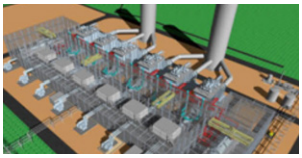
### Greening by Technology

**Developing advanced low-carbon technology on a global scale**

Contributing to stable power supply and mitigation of climate change through low-carbon energy technologies

Goal Increase sales of energy-related products to 1.9 trillion yen (FY2015).

Mega solar system



High-efficiency combined cycle thermal power plant

### Greening of Process

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

Minimizing production processes' impacts on the environment with high-efficiency manufacturing

Goal Increase eco-efficiency 1.5 times compared to the FY2000 level (FY2015).

Promote international marine container mixed transport

Water resource management

### Green Management

Continuously improving basic activities which support Toshiba's environmental management, including human resource development, environmental communication, and conservation of biodiversity

Goal Developing biotopes at Toshiba Group's major sites worldwide

Protecting rare species

Toshiba Group Global Environmental Action

## Aiming to secure a position as one of the world's foremost eco-companies

# Environmental Management Concept "T-COMPASS"

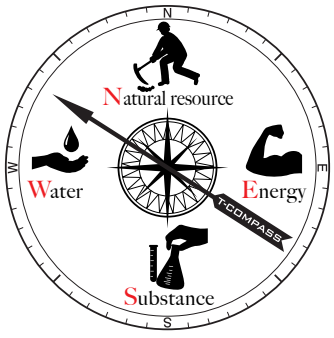
**We will further advance and expand our environmental management systems by strategically addressing new global trends in environmental management.**

Toshiba Group has introduced T-COMPASS*1, a concept of environmental management, to achieve two aims. One of these aims is to enhance management focused on multiple environmental areas (multiple criteria) and product life cycles; this represents a new global trend. As we strive to help realize a sustainable society, responding properly to energy problems and climate change is our highest priority. In addition to these global environmental issues, however, there are many local agendas such as factors influencing human health, ecosystems, and resources; all these issues must be resolved comprehensively. As Toshiba Group's compass for its environmental activities, T-COMPASS defines four domains for the group's environmental contributions and represents these domains as the symbols of the four cardinal compass points. We will systematically categorize measures implemented in the past into the four T-COMPASS domains and introduce various measures to enhance our environmental management with respect to products and manufacturing. For example, we will promote resource recycling to minimize the amount of resources consumed; promote the use of renewable energy and ensure compliance with the Scope 3 Standard to respond to climate change and energy issues; go one step beyond what is required by global regulations, such as reducing PVCs, to minimize the risks posed by chemical substances; and enhance management of our sites by taking water stress into consideration to minimize the amount of water resources.

We will also expand the scope of environmental management not only to individual products but also to our supply chain and organizations. Further, we will take into consideration local differences in environmental issues and strengthen our environmental strategies for different regions.

Our second aim is to expand our environmental management network. To realize environmental management supported by the participation of all Toshiba Group employees around the world, we must share a commitment to contributing to solving all environmental issues as the world's foremost eco-company. In Toshiba Group Global Environmental Action 2014, to develop action programs in countries around the world, we selected issues appropriate for different regions from among the environmental issues addressed in T-COMPASS.

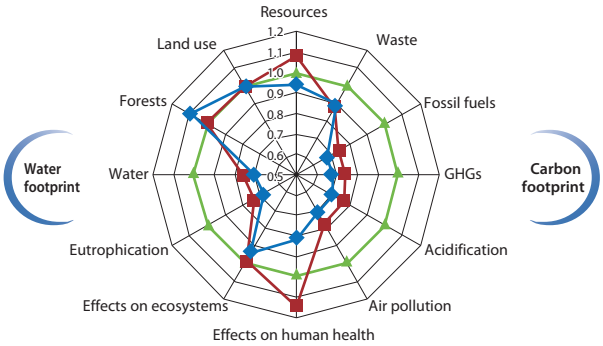
## Toshiba Group environmental compass T-COMPASS




## Characteristics of T-COMPASS

**●Characteristic: Visualizing environmental impacts by a radar chart**

T-COMPASS expresses LCA-based environmental indicators using its own radar chart. Symbols of the four cardinal compass points are used to represent the four major domains all Toshiba Group companies should address. The environmental footprint standard, which combines standards for assessing carbon and water footprints that have been recognized as global trends in recent years, makes reductions in overall environmental impacts easy to understand visually. Highly relevant environmental indicators are arranged appropriately along different axes; the radar chart depicts the structure of life cycle impact assessments in a simplified way. In addition to typical environmental indicators in the four major domains, other indicators are also defined in detail (up to eight or twelve points on the compass), thus enabling more detailed eco-designs.




**●Characteristic: Giving thought to regional characteristics**

Toshiba Group will use different environmental indicators for different regions in order to appropriately assess local environmental impacts such as air pollution, water contamination, and effects on the conservation of biodiversity. The Japanese version of the Life-cycle Impact assessment Method based on Endpoint modeling (LIME), which the Group currently uses, covers only evaluation coefficients based on data and values in Japan. Cutting-edge research and development are currently being carried out to adapt this method to various regions globally, and we will introduce new evaluation coefficients as soon as they become available.

## Toshiba Group's environmental footprints

Toshiba Group will analyze the environmental impacts of all its businesses throughout product life cycles in order to identify hot spots. By performing analysis on a trial basis while making the most of the LCA databases it has developed, the Group aims to establish a life-cycle impact assessment method based on the latest discussions about environmental footprints (see p. 22 for assessment results).

*1 T-COMPASS: Toshiba Comprehensive environmental database and its Practical Application to Simplified and/or Streamlined LCA
*2 SAICM: Strategic Approach to International Chemicals Management

## Column Toward enhancing measures in four areas

We invited experts in the four areas of T-COMPASS to report on the global state of the art in their respective areas of specialization at the 24th Toshiba Group Environmental Exhibition (held in June 2015; see p. 64). We will use what we learned from these reports to develop measures within Toshiba Group in the future.

### Life cycle design to further develop resource recycling systems

Sustainability Design Theory Laboratory, Department of Precision Engineering,
Graduate School of Engineering, the University of Tokyo
Professor **Yasushi Umeda**

In Europe, active movements aim to develop resource-recycling systems in order to secure employment and enhance competitiveness. Research is being conducted on key topics such as "systemic eco-innovation," "resource efficiency," "sustainable material use," "product and service systems," "circular economies," and "environmental footprints."
Appropriate resource recycling requires that recycling systems be designed in advance and product lifecycles be properly managed. The manufacturing industry must restructure itself into a "life cycle industry." Rather than the products themselves, it is essential to visualize and analyze product life cycles, thereby creating life cycle designs that enable provision of necessary functions and services without using resources. Companies already possess a large number of elementary technologies. The key is to review how to combine these technologies in order to provide services.

### Risks and opportunities of climate change

Integrated Assessment Modeling Section, Center for Social and Environmental Systems Research,
National Institute for Environmental Studies
**Toshihiko Masui,** Director

Global warming has become inevitable, and adaptation measures to minimize the impacts of global warming are now recognized as fundamental policy measures. The Japanese government has specified an emissions reduction goal for mitigation measures with a view toward achieving international consensus on a goal for 2030. Emissions reductions require changes to technologies and systems. Delays in implementing initiatives are expected to narrow the range of options for limiting the temperature increase to less than 2°C and to cause mitigation costs to increase.
When reviewing mitigation measures, visualizing environmental effects is crucial. There is a need to introduce technologies one-by-one by distinguishing between those that can be deployed immediately and those that should be evaluated for purchase from a medium- or long-term perspective. It is important not only to further develop and promote energy-saving products, but also to widely introduce such products in Asia, where greenhouse gas emissions are likely to increase rapidly in the future.

### Trends in water footprints and the development of the concept of environmental footprint

Department of Environmental Management, Faculty of Environmental Studies,
Tokyo City University
Professor **Norihiro Itsubo**

Today, how to maintain and secure water resources is a global concern; the water footprint (WF) has come to be known as a measure indicating the severity level of global water problems. In FY2014, international standards on WF was established, leading to expectations that the WF concept will be used more widely as a tool for visualizing environmental information in order to determine actions. Overseas, companies such as Levi Strauss & Co. and Coca-Cola are already using the WF concept to visualize and analyze the relationships between their business activities and water resources.
In addition, LCA's scope of application has been expanding in recent years, including attempts to calculate global environmental footprints. In particular, case studies on climate change (carbon), resource, water, and land footprints have been published. Footprint data will likely play an important role in environmental information disclosure in the future.

### The leading edge of chemical risk assessment

Emission and Exposure Analysis Group, Research Institute of Science for Safety and Sustainability,
National Institute of Advanced Industrial Science and Technology
**Kiyotaka Tsunemi,** Group leader

The Strategic Approach to International Chemicals Management (SAICM[*2]) aims to minimize risks related to chemical substances. In fact, hazard-based alternative selection as described in the European RoHS Directive may help reduce risks to a certain extent, but it sometimes also increases costs for the country overall. Risk-tradeoff assessment may change management methods significantly. Risks can never be entirely eliminated. However, it is crucial to consider risk tolerance levels along with measures to cope with different levels of risk.
In the future, we must develop advanced methods for assessing the total amount of risks caused by simultaneous exposure to multiple chemicals as well as to assess the tradeoffs for risks caused by substances other than chemicals. For example, when assessing the tradeoff between reducing environmental impact by replacing gasoline with hydrogen and the risks of explosion and material leakage, it will be necessary to create a comprehensive assessment system that includes social receptivity.

# Progress in the Fifth Environmental Action Plan

Toshiba Group achieved its annual goal for overall eco-efficiency by reaching its eco-efficiency goals in two areas: products and business processes.

## In FY2014, we achieved our annual goal for overall eco-efficiency

In order to realize an ideal state of environmental management in 2050, Toshiba Group formulates environmental action plans and manages specific environmental activities and their targets. Since we formulated our first environmental action plan in FY1993, the Group has expanded its scope of environmental activities and governance. In the Fifth Environmental Action Plan, which covers the period from FY2012 to FY2015, we are working on 22 activity items.

The Environmental Vision 2050 requires the Group to increase the degree of improvement in overall eco-efficiency by ten times (Factor 10) by FY2050 and by five times (Factor 5) by FY2025 compared to the FY2000 level. By backcasting from 2050, we worked to achieve the FY2014 goal of increasing eco-efficiency by 2.9 times (Factor 2.9). As a result, we increased product eco-efficiency in FY2014 by 3.31 times (target: 3.2 times) compared to the FY2000 level thanks to continued progress in creating value and reducing environmental impacts mainly in the areas of social infrastructure, healthcare systems & services, and electronic devices & components. We improved business process eco-efficiency by 1.51 times (target: 1.47 times) because of reductions in greenhouse gas emissions through energy-saving investments and energy-saving diagnosis. As a result, Toshiba Group succeeded in improving overall efficiency by 2.95 times (Factor 2.95) in FY2014 compared to the FY2000 level, exceeding our target of 2.9 times.

## Achieved Status of the Fifth Environmental Action Plan

The table on the right side summarizes the progress made in FY2014 with respect to the Fifth Environmental Action Plan. During FY2014, Toshiba Group achieved its goals for 20 of the 22 items in the Plan.

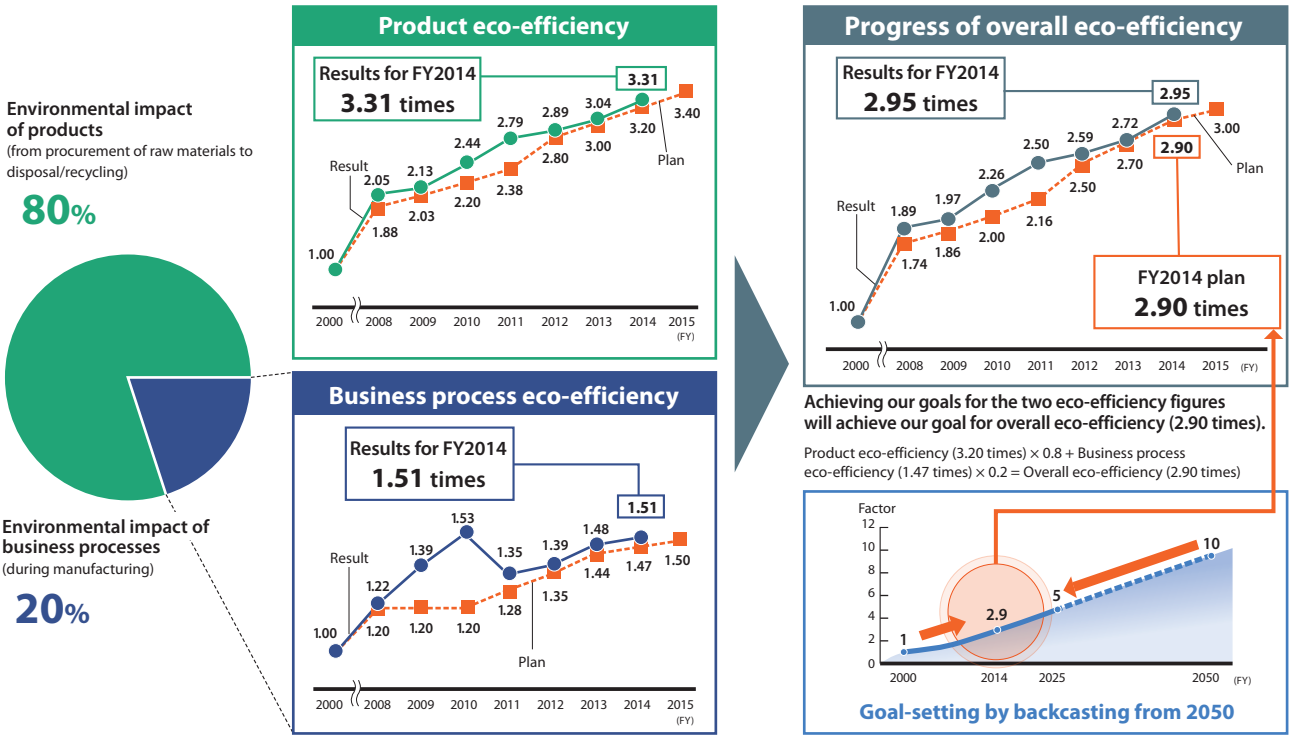
In the Greening of Products and Greening by Technology initiatives, we achieved our goals for six of the seven items. In particular, sales of excellent ECPs were 2.34 trillion yen, greatly exceeding the amount initially planned. As for reducing $CO_2$ with energy-related products, we could not achieve our goal due to a delay in commencing operation of a plant under construction. We will step up our efforts to promote high-efficiency thermal power generation as well as use of renewable energy.

In the Greening of Process initiative, we achieved our goals for eight of the nine items. We achieved our goal of reducing total greenhouse gas emissions mainly by making energy-saving investments; conducting energy-saving diagnosis globally; taking measures to conserve electricity used for air conditioning, lighting, etc.; and monitoring power consumption more closely. Although we reduced the amount of final waste disposal, we were unable to achieve our target percentage of final waste disposal because of difficulties at our overseas production sites.

In the Green Management initiative, we achieved our goals for all three items. Specifically, to conserve biodiversity, we effectively used our business and production sites to protect rare flora and fauna. In terms of environmental education and human resource development, we trained employees as Toshiba eco-style leaders. To promote environmental communication, we implemented Toshiba Group Global Environmental Action.

In FY2015, we aim to achieve all goals in the Fifth Environmental Action Plan by accelerating global business development in the energy sector and placing strict controls on waste management at our overseas production sites.

■ **Progress of overall eco-efficiency**



## ■ Toshiba Group's Fifth Environmental Action Plan

| Eco-efficiency | FY2014 | | | FY2015 |
|---|---|---|---|---|
| | Goal | Result | Evaluation | Goal |
| Improvement of overall eco-efficiency (compared to FY2000 level) | 2.9 times | 2.95 times | Achieved | 3.0 times |
| Improvement of product eco-efficiency (compared to FY2000 level) | 3.2 times | 3.31 times | Achieved | 3.4 times |
| Improvement of business process eco-efficiency (compared to FY2000 level) | 1.47 times | 1.51 times | Achieved | 1.5 times |

| Greening of Products / Greening by Technology | | FY2014 | | | FY2015 |
|---|---|---|---|---|---|
| | | Goal | Result | Evaluation | Goal |
| Overall | Increasing sales amounts of Excellent ECPs (Greening of Products / by Technology) | 1.5 trillion yen | 2.34 trillion yen | Achieved | 1.8 trillion yen |
| | | Sales of certified products increased in the areas of social infrastructure, healthcare systems & services, and electronic devices. | | | |
| | Increasing sales amounts of energy-related products (Greening by Technology) | 1.66 trillion yen | 1.66 trillion yen | Achieved | 1.9 trillion yen |
| | | We will step up efforts to increase sales of these products globally. | | | |
| Mitigation of climate change | Reduction of $CO_2$ emissions through eco-products*1 (Greening of Products) | 12 million tons | 13.12 million tons | Achieved | 15 million tons |
| | | We improved energy-saving performance, thereby reducing $CO_2$ emissions during product use. | | | |
| | Reduction of $CO_2$ emissions through energy-related products*2 (Greening by Technology) | 480 million tons | 448 million tons | Not achieved | 490 million tons |
| | | We could not achieve the goal because the start of operation of a plant under construction was delayed. We will promote use of high-efficiency thermal power generation and renewable energy. | | | |
| Efficient use of resources | Resource savings for products*3 | 43% | 79% | Achieved | 50% |
| | | We made progress in areas such as making LCD TV sets flatter and lighter as well as reducing the footprints of medical equipment and increasing the capacity of magnetic disks. | | | |
| | Increasing the use of recycled plastics for products*4 | 2.9% | 7.5% | Achieved | 3.0% |
| | | We made progress in using recycled plastic components for refrigerators, home air conditioners, and industrial air conditioning systems, etc. | | | |
| Management of chemicals | Reduction of specified chemical substances contained in products*6 (reduction of PVC*5/BFRs*5) | 50 product groups | 54 product groups | Achieved | Total 80 product groups |
| | | We reduced use of PVC and BFRs mainly in lifestyle products. | | | |

| Greening of Process | | FY2014 | | | FY2015 |
|---|---|---|---|---|---|
| | | Goal | Result | Evaluation | Goal |
| Mitigation of climate change | Reduction in total greenhouse gas emissions*7 (Compared to FY1990 level) | 4.19 million tons (62%) | 3.02 million tons (45%) | Achieved | 4.39 million tons (65%) |
| | | We made improvements by actively promoting energy-saving investments and energy-saving diagnosis. | | | |
| | Improvement of total energy-derived $CO_2$ emissions per unit production*8 (Compared to FY2010 level) | 92% | 80% | Achieved | 90% |
| | | We made improvements by actively promoting energy-saving investments and energy-saving diagnosis. | | | |
| | Improvement of total $CO_2$ emissions from product logistics per unit production (Compared to FY2010 level) | 96% | 73% | Achieved | 95% |
| | | We made improvements by improving load factors and restructuring logistics centers. | | | |
| Efficient use of resources | Reduction in waste volumes*9 (Compared to FY2000 level) | 116,000 tons (62%) | 88,000 tons (47%) | Achieved | 117,000 tons (62%) |
| | | More waste was turned into valuables due to efforts to sort waste liquid by degree of degradation. | | | |
| | Improvement of the total volume of waste generated per unit production (Compared to FY2010 level) | 93% | 84% | Achieved | 90% |
| | | We reduced the total amount of waste relative to the increase in production. | | | |
| | Reduction in the percentage of final waste disposal (Compared to the total volume of waste generated by Toshiba Group) | 1.0% | 1.4% | Not achieved | 0.5% |
| | | We reduced the amount of final waste disposal at targeted overseas business and production sites, but we could not achieve our goal for the percentage of final waste disposal. | | | |
| | Improvement of the amount of water received per unit production (Compared to FY2010 level) | 92% | 78% | Achieved | 90% |
| | | We reduced the amount of water received by improving the efficiency of the pure water manufacturing process. | | | |
| Management of chemicals | Reduction in the total emissions of chemicals discharged (Compared to FY2000 level) | 1,763 tons (65%) | 1,455 tons (58%) | Achieved | 1,967 tons (78%) |
| | | We reduced chemical emissions by reorganizing our production sites and reviewing ventilation conditions. | | | |
| | Improvement of the amount of chemicals handled per unit production (Compared to FY2010 level) | 97% | 92% | Achieved | 95% |
| | | We made improvements by improving production efficiency and by using less dangerous alternate materials. | | | |

| Green Management | | FY2014 | | | FY2015 |
|---|---|---|---|---|---|
| | | Goal | Result | Evaluation | Goal |
| Conservation of biodiversity | Developing ecosystem networks with our sites playing a central role in collaboration with local communities | Percentage of sites for which indicators were selected 100% / Percentage of sites with measured effects 50% | Percentage of sites for which indicators were selected 100% / Percentage of sites with measured effects 67% | Achieved | 100% of sites have measured effects |
| | | We selected indicators at 66 sites in 10 countries worldwide and started measuring effects at 44 sites. | | | |
| Environmental education and human resource development | Development of Toshiba eco-style leaders | 800 leaders | 800 leaders | Achieved | 2,000 leaders |
| | | At Eco Products 2014, an exhibition in Japan, eco-style leaders conducted an eco-style tour in which children explored our exhibition booth. | | | |
| Environmental Communication | Expanding environmental communication to connect people around the world | Toshiba Group Global Environmental Action | We implemented 150 programs at 110 of our business and production sites in 20 countries worldwide | Achieved | Promotion of "Global Environmental Action" to cope with global environmental issues |
| | | On June 5, we held an event on World Environment Day and introduced activities in countries around the world with videos and display panels. | | | |

Figures for benchmark years indicate performance data in the boundary set for 2014. 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 production = [Nominal output in Japan] / [corporate goods price index (for electrical equipment) announced by the Bank of Japan for the year (compared to 1990 levels, where 1990 is represented as 1)] + [nominal output outside Japan]

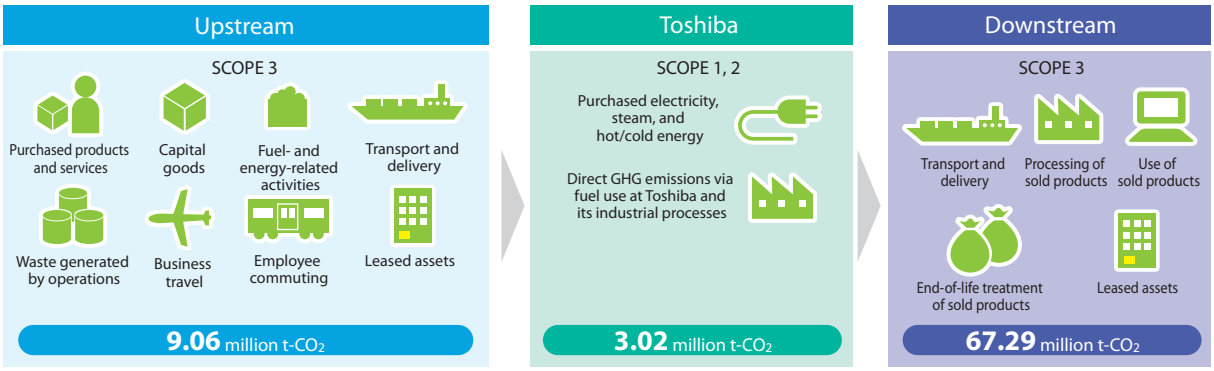
*1 [$CO_2$ emissions of assumed substitute products] - [$CO_2$ emissions of shipped products] (Compares annual emissions during the usage stage and cumulates emissions for half the product life.)
*2 Compared with $CO_2$ emissions (rate to net production output) for average thermal power of the same fuel type; for nuclear power/renewable energy, compared with $CO_2$ emissions (rate to net production output) for average thermal power of all types.
*3 Rate of increase in the amount of resources saved (based on FY2010).
*4 [Amount of recycled plastics] / [Amount of plastics used for products] × 100
*5 PVC: Polyvinyl chloride is one of the most common plastics and is used in a wide range of products. There is concern about the generation of hazardous substances due to inappropriate treatment of PVC at the time of disposal and the harmfulness of some additives (e.g., phthalate esters) used to soften PVC.
BFR (brominated flame retardants): BFRs are used as flame retarders for plastics. Some BFRs are raising health concerns while others persist in the environment or are bioaccumulative. There is also concern over the generation of hazardous substances due to inappropriate treatment at disposal.
*6 Abolished except special uses.
*7 5.70 t-$CO_2$/10,000 kWh is used for the power factor in Japan. GHG Protocol data is used overseas.
*8 The coefficient of electricity for sites in Japan is fixed to that of FY2010.
*9 Obtained by deducting the volume of objects with value from the total volume of waste generated (excluding business and production sites engaged in waste treatment and power generation).

## TOPICS Making GHG emissions in the supply chain visible for all categories

Toshiba Group is working to calculate and analyze GHG[*1] emissions throughout its entire supply chain. Also, the Group calculates such emissions for all categories using the calculation methods based on the Ministry of the Environment's guidelines[*2] and compares the results to those for the previous year for each category. In FY2014, the GHG emissions during product use (the life cycle stage having the largest amount of emissions) increased about 28% compared to the previous year.
Toshiba Group believes that it is important to work effectively to reduce GHG emissions throughout the product life cycle by quantitatively analyzing emissions per category as described above.

*1 $CO_2$, $CH_4$, $N_2O$, HFCs, PFCs and $SF_6$
*2 Basic guidelines for calculating GHG emissions throughout the supply chain

**(FY2014)**



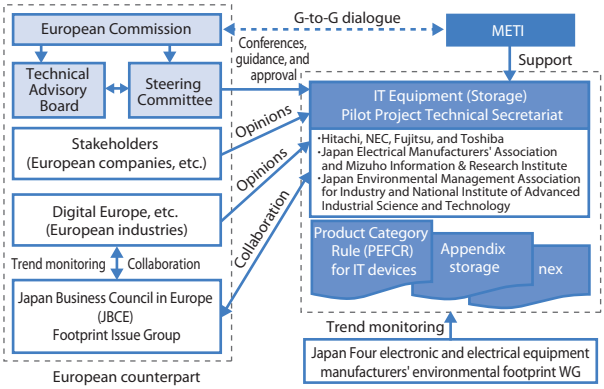

| Category | | Categories covered by calculations | FY2013 calculation results (10,000 t-$CO_2$) | FY2014 calculation results (10,000 t-$CO_2$) | Changes in emissions | Considerations |
|---|---|---|---|---|---|---|
| Upstream | 1 | Purchased goods and services | 700 | 750 | 7.1% | GHG emissions increased due to growth in purchased capital goods. |
| | 2 | Capital goods | 81 | 83 | –1.9% | As a result of screening investments, GHG emissions were reduced. |
| | | | | | 5.9% | GHG emissions increased due to investments in the semiconductor business. |
| | 3 | Fuel- and energy-related activities (not included in Scope 1 or 2) | 16 | 16 | –0.5% | GHG emissions decreased mainly because of energy-saving efforts. |
| | 4 | Upstream transportation and distribution | 50 | 47 | –6.7% | GHG emissions reduced due to modal shifts as well as lighter and smaller products. |
| | 5 | Waste generated in operation | 3 | 3 | 6.3% | GHG emissions increased due to growth of the semiconductor business. |
| | 6 | Business travel | 7 | 7 | 3.2% | GHG emissions increased mainly due to business travel for business expansion. |
| | 7 | Employee commuting | - | - | - | GHG emissions for this category were estimated at 0.1% of the total or less. |
| | 8 | Upstream leased assets | - | - | - | This category is not relevant, because the type of industry category of Toshiba is manufacturing. |
| Toshiba | 9 | Direct GHG emissions (Scope 1) | 78 | 75 | –3.9% | GHG emissions decreased mainly because of energy-saving efforts. |
| | 10 | Indirect emissions associated with energy-derived emissions (Scope 2) | 228 | 227 | –0.6% | GHG emissions decreased mainly because of energy-saving efforts. |
| Downstream | 11 | Downstream transportation and distribution | 14 | 11 | –18.7% | GHG emissions decreased due to smaller and lighter products. |
| | 12 | Processing of sold products | - | - | - | In this category, we mainly deal with finished products and parts that do not require processing. |
| | 13 | Use of sold products | 5,295 | 6,758 | –8.6% | GHG emissions decreased mainly because of energy-saving efforts related to TV and air conditioning systems. |
| | | | | | 36.3% | GHG emissions increased because of increased sales of industrial and electronic equipment. |
| | 14 | End-of-life treatment of sold products | ▲36 | ▲40 | 12.3% | The GHG-emission decreasing effect was enhanced because of increased use of reusable materials. |
| | 15 | Leased assets (Downstream) | - | - | - | This category is not relevant, because the type of industry category of Toshiba is manufacturing. |
| | 16 | Franchises | - | - | - | This category is not relevant, because the type of industry category of Toshiba is manufacturing. |
| | 17 | Investments | - | - | - | This category is not relevant, because the type of industry category of Toshiba is manufacturing. |
| Total | | | 6,436 | 7,937 | | |

## TOPICS Initiative on the European Environmental Footprint for evaluating multiple environmental impacts

As part of a policy of creating a single market for green products, the European Commission has proposed an Environmental Footprint System* for products and organizations, and is proceeding to formalize the system. By selecting important environmental effects from among 15 environmental impact categories instead of using a single indicator, such as carbon emissions or water consumption, this system facilitates disclosure of relevant information on life-cycle environmental impacts of products and organizations in order to identify important processes by using what is known as hotspot analysis. To promote the pilot project, Toshiba Group has organized a consortium led by four electrical product manufacturers to participate in developing the Product Environmental Footprint Category Rules (PEFCR) on calculating footprints for IT equipment (storage devices).

*1: EU Gazette, "Recommendation of April 9, 2013, on the use of common methods to measure and communicate the life cycle environmental performance of products and organizations (2013/179/EU)"

### ■ Structure of the European Environmental Footprint Pilot Project




### ■ 15 Environmental Impact Categories of the European Environmental Footprint

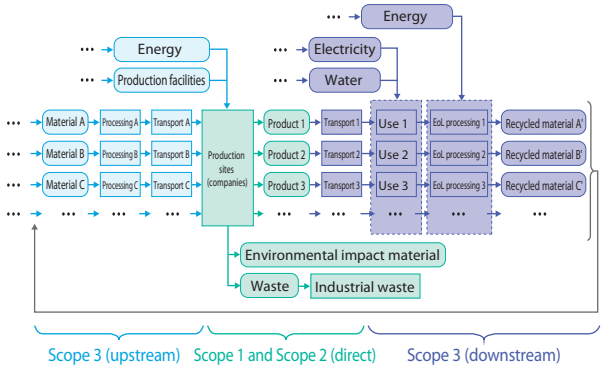
| Impact Category | Impact Assessment Model | Impact Category indicators |
|---|---|---|
| Climate Change | Bern model - Global Warming Potentials (GWP) over a 100 year time horizon. | kg $CO_2$ equivalent |
| Ozone Depletion | EDIP model based on the ODPs of the World Meteorological Organization (WMO) over an infinite time horizon. | kg CFC-11 equivalent |
| Ecotoxicity for aquatic fresh water | USEtox model | CTUe (Comparative Toxic Unit for ecosystems) |
| Human Toxicity - cancer effects | USEtox model | CTUh (Comparative Toxic Unit for humans) |
| Human Toxicity - non- cancer effects | USEtox model | CTUh (Comparative Toxic Unit for humans) |
| Particulate Matter/Respiratory Inorganics | RiskPoll model | kg PM2.5 equivalent |
| Ionising Radiation - human health effects | Human Health effect model | kBq U235 equivalent |
| Photochemical Ozone Formation | LOTOS-EUROS model | kg NMVOC equivalent |
| Acidification | Accumulated Exceedance model | mol H+ eq |
| Eutrophication - terrestrial | Accumulated Exceedance model | mol N eq |
| Eutrophication - fresh water | EUTREND model | kg P equivalent |
| Eutrophication - marine | EUTREND model | kg N equivalent |
| Resource Depletion - water | Swiss Ecoscarcity model | $m^3$ water use related to local scarcity of water |
| Resource Depletion - mineral, fossil | CML2002 model | kg antimony (Sb) equivalent |
| Land Transformation | Soil Organic Matter (SOM) model | kg (deficit) |

## Toshiba Group's environmental footprints

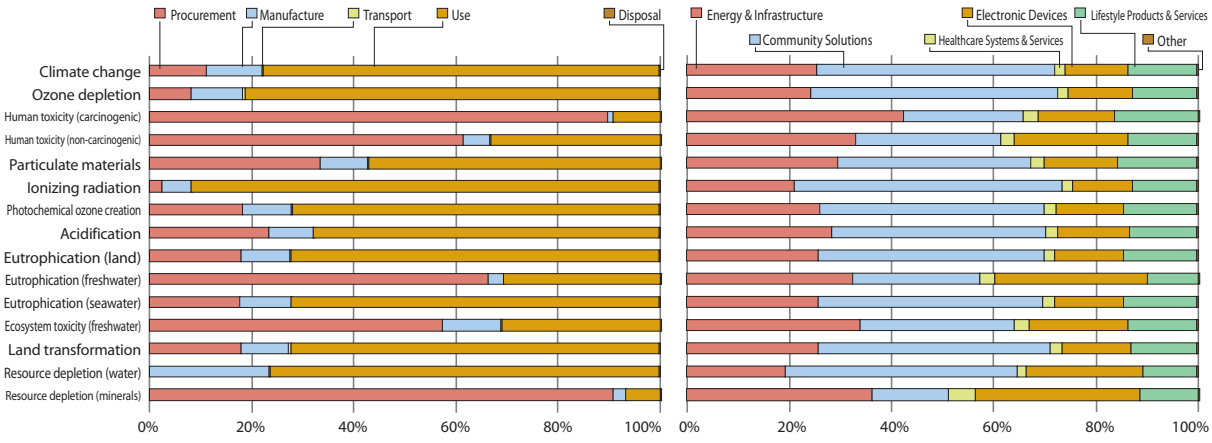
In the European Environmental Footprint System, Organization Environmental Footprint Sector Rules (OEFSR) are being drafted alongside rules on products. Using the calculation method currently under development, Toshiba Group calculated the environmental footprint of the Group as a whole for FY2013.

The calculation results enabled us to identify climate change and resource depletion (minerals) as important impact areas. Our analysis indicated that electricity consumption during the stage of product use in the community solution sector, steel materials during the stage of procurement in the energy & social infrastructure sector, and nonferrous metals during the stage of procurement in the electronic device sector were the significant "Hotspots" in important processes. Using these results, we will perform analysis based on the Toshiba T-COMPASS approach and work to reduce the environmental impact of all of our corporate activities.

### ■ Scope of calculation (system boundary)

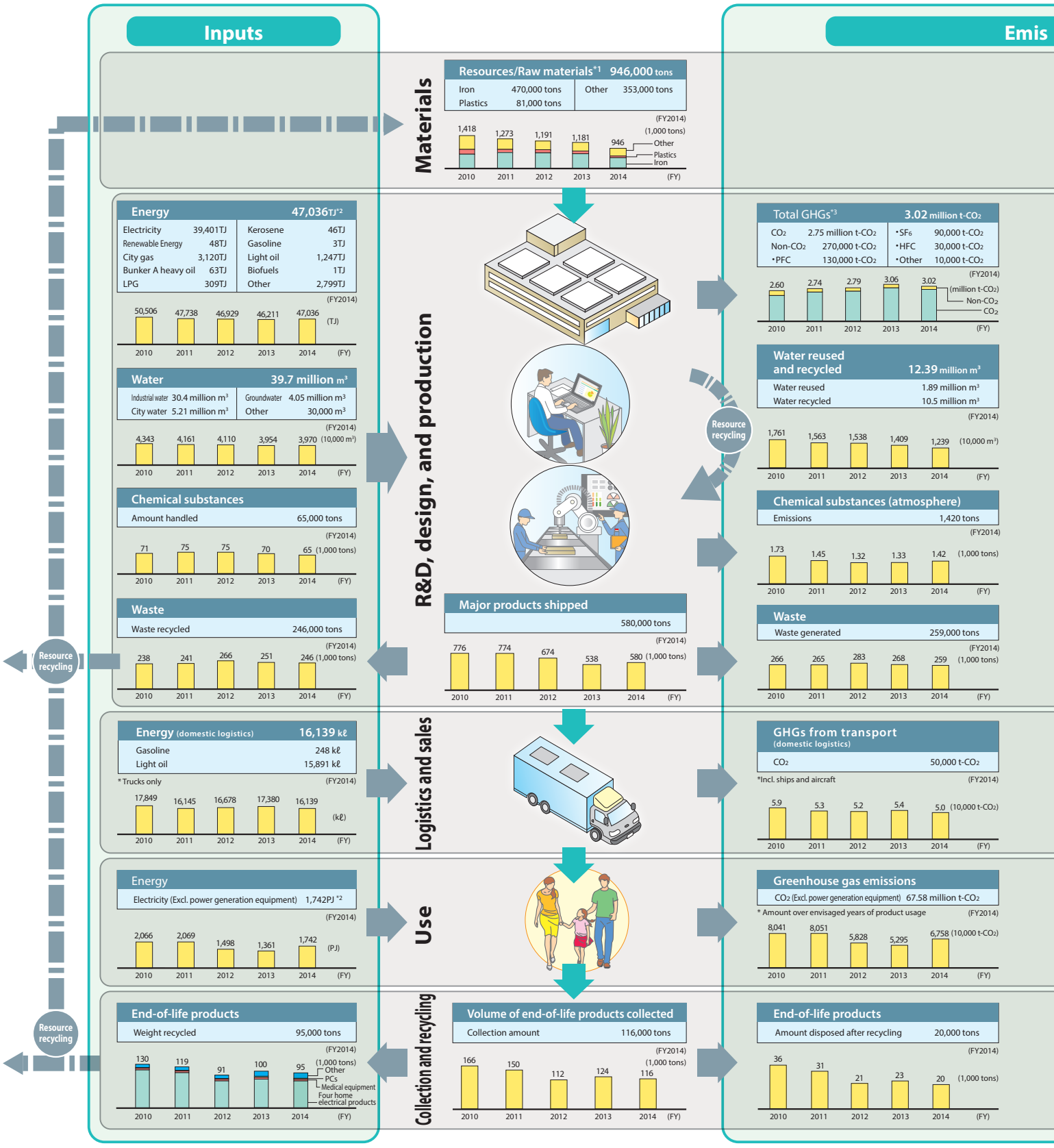



### ■ Toshiba Group's environmental footprint (left: breakdown by life-cycle stages; right: breakdown by business sector)



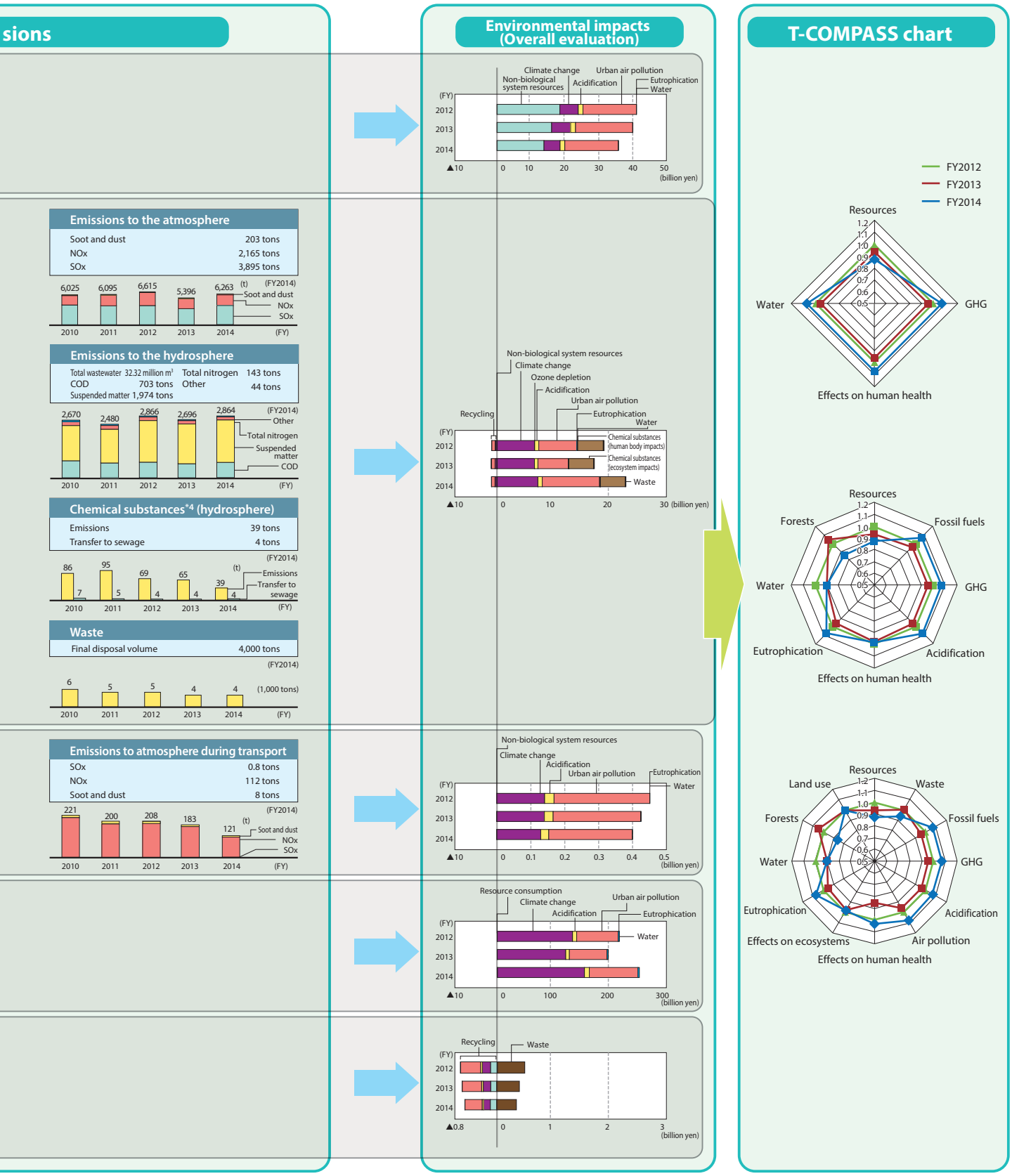
# Overview of Environmental Impacts

Toshiba Group, as shown in the material flow below, is proceeding to quantitatively analyze the environmental impacts at each stage of the product/service life cycle—from materials procurement, manufacturing, and distribution to customer usage, product retrieval, and recycling. Furthermore,




*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" : Estimation method for Material-inputs using Input-Output Table) 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 is 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 totalize as resources the imported inputs that accompany the procurement of complex materials and service businesses. However, by using this method, it has become possible to grasp the amount of imported inputs by material category for such procured materials as well.

we are carrying out overall assessments on the environmental impact of input resources/energy and emission of greenhouse gas and chemicals using the Life-cycle Impact assessment Method based on Endpoint modeling (LIME) (refer to page 35 for details). We realized that the environmental impact is most significant during the customer usage, material procurement, and manufacturing stages of the product life cycle in that order. As such, we feel that it is extremely important to implement effective initiatives based on environmental impact assessments carried out across the entire product life cycle. Moving forward, we are expanding the items on which we are collecting data and are striving to improve the precision of the data. This data was collected from 584 Toshiba Group companies (actual results for FY2014).




*2 TJ = $10^{12}$ J; PJ = $10^{15}$ J. The joule is a unit of energy measuring mechanical work, heat, and electricity. One joule equals about 0.239 calories.
*3 In this table, the $CO_2$ emission coefficient for electricity in Japan is 3.50 t-$CO_2$/10,000 kWh in FY2010, 4.76 t-$CO_2$/10,000 kWh in FY2011, 4.87 t-$CO_2$/10,000 kWh in FY2012, and 5.70 t-$CO_2$/10,000 kWh in FY2013 and FY2014.
*4 The volume of hydrogen fluoride and its water-soluble salt emitted into hydrosphere since FY2009 is calculated to be zero because hydrogen fluoride used becomes non-water-soluble salt through post-use treatment.

# Aiming to achieve the highest level of environmental performance, we strive to expand the creation and widespread use of Excellent ECPs.


INDEX

## Summary of activities in FY2014



## Creation of Excellent ECPs

**●Aiming to achieve the highest level of environmental performance for all products that we develop**

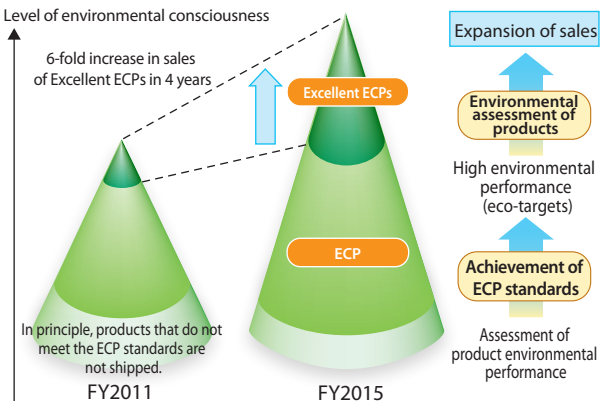
Toshiba is implementing the Greening of Products initiative, which aims to achieve the highest level of environmental performance for all products that we develop and to minimize the environmental impact of products throughout their entire life cycles. We will promote the development of localized products designed to minimize environmental impact in response to the individualized needs of different countries and areas, including products equipped with cutting-edge features for developed countries as well as products for developing countries, where environmental impact is likely to increase as a result of economic growth.

To create ECPs, Toshiba Group sets "eco-targets" and incorporates them into product specifications to develop products with the highest level of environmental performance in the business strategy formulation and product planning stages.

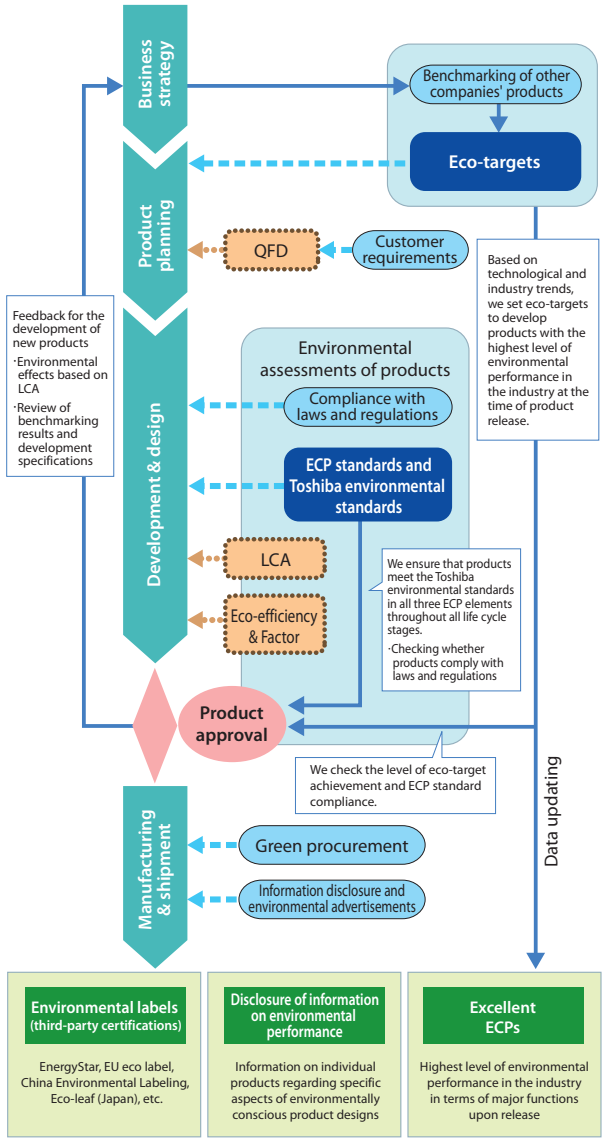
Then, in the product development and design stages, we make environmental assessments of the products to ensure that they meet the Toshiba environmental standards. During the environmental assessments, we check whether the products comply with laws and regulations as well as meet the ECP standards in all three elements throughout all stages of their life cycles.

In the final 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.

### ■ Expansion of creation of Excellent ECPs



## ■ Process of creating Excellent ECPs




## Aiming to increase product eco-efficiency by 3.4 times in FY2015

Since 2003, Toshiba Group has been promoting activities to create ECPs by viewing product eco-efficiency, or the Factor, as an important indicator.

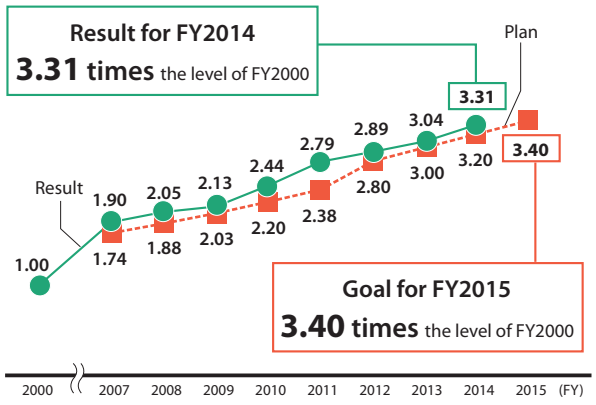
**●Results of FY2014 and future initiatives**

By the end of FY2014, we had calculated the Factor values (degree of improvement in eco-efficiency) for almost all Toshiba Group products. By enhancing the value of products and by reducing their environmental impact, Toshiba Group was able to increase the average environmental efficiency of all products by 3.31 times (Factor 3.31) compared to FY2000, greatly exceeding our initially planned goal.

We aim to increase product eco-efficiency to 3.40 times the level of the base year in FY2015.

### Product eco-efficiency

Value of a product / Environmental impact of a product

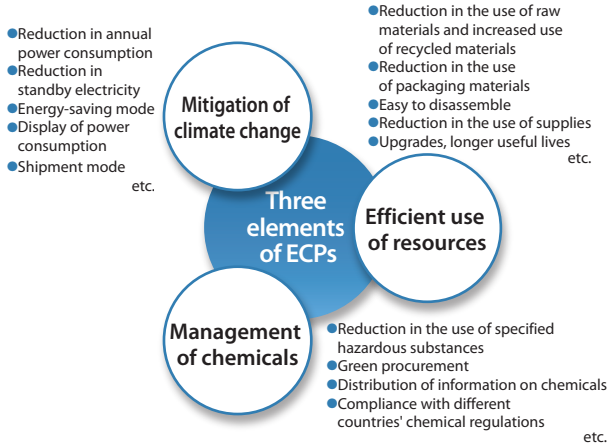



## Toshiba Environmental Standards

### - Assessment based on the three elements of ECPs -

Environmentally Conscious Products (ECPs) are designed to minimize environmental impact throughout all stages of their life cycles, including during procurement of materials, manufacture, distribution, use, disposal, and recycling. ECPs have three elements: mitigation of climate change, effective use of resources, and management of chemicals. Toshiba Group sets its own environmental standards (ECP standards) for each product model to assess overall environmental performance, which includes all three of these elements. Environmental assessments are performed during the development of every product to check not only whether the product complies with laws and regulations but also to check whether the product meets the ECP standards.

### ■Three elements of ECPs



# Excellent ECPs

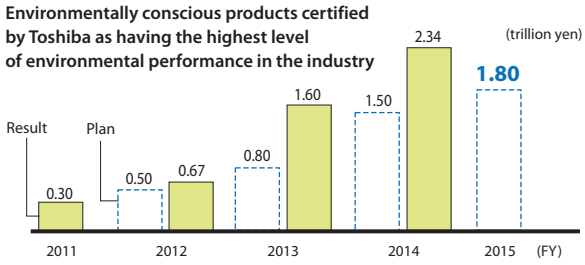
## Group-wide efforts for the creation of products with the highest level of environmental performance

**●Results of FY2014 and future initiatives**

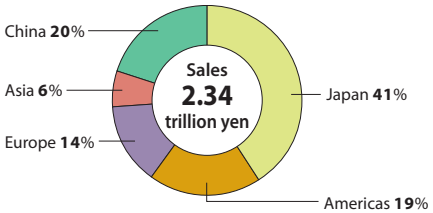
Toshiba Group is making efforts to achieve the highest level of environmental performance for all products we develop. In an effort to enhance the creation of ECPs, we have introduced sales of Excellent ECPs as an indicator. In FY2014, we certified 143 products as Excellent ECPs. As a result of expanding the range of certified products in the areas of social infrastructure, healthcare, and electronic devices, including the certification of low-end notebook PCs, Toshiba Group's sales of Excellent ECPs totaled 2.34 trillion yen, greatly exceeding the goal (1.8 trillion yen) for FY2015 one year ahead of schedule. Excellent ECPs are being created in countries around the world, but not limited to products for the domestic market.

We will further accelerate the creation of Excellent ECPs in the areas of solutions and system products, for which environmental performance is difficult to evaluate, with a view to achieving the creation of Excellent ECPs in all Toshiba Group product areas.

### ■ Sales of Excellent ECPs




### ■ Breakdown of sales of Excellent ECPs




[By region]

### ■Products certified as Excellent ECPs in FY2014

## Energy & Infrastructure Systems

In order to meet growing energy demand in the world, Toshiba Group will provide basic power supply and power generation systems globally that contribute to a stable energy supply and the shift toward a low carbon society as well as equipment, systems, and services that support social and industrial infrastructure. It is expected that residential fuel cell systems will be used widely as the next generation in power generation systems. In addition, Toshiba Group's secondary battery SCiB is installed on cars, power generation systems, and a variety of other devices by taking advantage of its features, including quick charging, a long battery life, and a high level of safety.

### Residential fuel cell system ENE-FARM (Model TM1-AE)

- Highest total energy efficiency of 95% and amount of $CO_2$ emission reduction of approx. 1.6 tons per year in the industry*1
- Self-sustained operation function that ensures continuous operation even in the event of an outage
- Resource saving with a guaranteed battery life of 10 years

### SCiB™ stationary battery energy storage system

- Realizing the top level capacity and output in the industry, as well as the fastest charging time in the industry*1
- Highest cycle count (10,000) in the industry, and resource saving through downsizing*1
- System downsizing is possible as the required charge and discharge output can be obtained with less battery capacity


## Community Solutions

In order to contribute to the creation of smart communities designed to be environmentally friendly and to ensure comfortable lifestyles, Toshiba Group provides total solutions for a wide range of areas, including energy and water as well as transportation and medical care, for offices, factories and homes. In offices, for example, we develop devices with the highest efficiency for facilities (e.g., lighting and air conditioning systems as well as elevators) and provide advanced office equipment. We also provide services for achieving detailed control of the operation of such devices, thereby reducing the overall energy consumption of buildings. In the retail business, we contribute to reducing environmental impact with solutions for linking together stores, warehouses, offices, and customers.

### Smart BEMS

- Achieving a total of 32% energy saving: 11% with the BEMS function consisting of model-based air-conditioning, image sensors, peak-cut and peak-shift systems, etc. with the rest being accounted for by devices with high-efficiency

Smart Community Center in Kawasaki

### Ultra Power Eco, an air conditioner for stores and offices

- Highest energy saving performance in the industry*1 Achieving (APF2015:7.0)*2
- Reducing the front space required to install outside units by 50%
- Using R32 refrigerant, which has less GWP (Global Warming Potential)

## Healthcare Systems & Services

To meet the needs of medical care, which continue to become more complex and diverse, Toshiba Group is developing image diagnosis systems (e.g., X-ray equipment and Ultrasonic diagnosis system) to provide the most advanced medical services with the least environmental impact. We promote environmentally conscious design from a wider perspective by using dose reduction technologies (which minimize the doses that patient and medical workers are subjected to), energy-saving technology, and resource conservation technology (which reduces installation work by decreasing the size and weight of products).

### X-ray angiography system Infinix Celeve™-i Series

- Highest energy and resource savings in its class*1 (power consumption & installation space)
- Realizing reduced radiation exposure through low- dose acquisition, a new FPD (Flat Panel Detector), and low frame-rate sequential radiography
- Contributing to improved workflow with a new overhead traveling C-arm

### Ultrasonic diagnosis system Xario™ 100

- Highest resource saving in its class*1 Realizing excellent mobility with the compact and light system
- Top level energy saving performance*1 Improving examination efficiency with stand-by mode settings and an intuitive and simple operating panel


## Lifestyle Products & Services

Toshiba Group provides high-value-added, low-environmental-impact products designed for comfortable, environmentally friendly lifestyles. To meet the needs of customers sometimes even ahead of the times around the world, we offer products and services that best fit local characteristics.

### 4K television REGZA Z10X series

- Achieving both energy saving and high image quality with the area control technology applied to the LEDs installed directly beneath the display panel and other technologies
- Lightweight with the use of an integrated housing structure

### Detachable PC dynabook R82

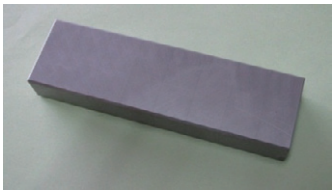
- Achieving energy, resource, and space savings with an convertible and detachable design
- Lightest tablet in the world (699 g*1) 1,399 g as an Ultrabook
- Reducing power consumption with a fanless structure using a new material, PCM*3

## Electronic Devices & Components and Cloud Solutions

In the electronic devices & components segment, Toshiba Group has been developing businesses with the aim of contributing to the environment by providing distinctive high performance material products that leverage its material design technologies developed through years of experience. In addition, to support the use of advanced ICT, including data centers and servers, in the big data era, Toshiba Group is developing storage products such as NAND flash memory drives and HDDs, thereby playing a leading role in the industry. At the same time, we also strive to contribute to the solution of global environmental issues relating to these products with the power of IT.

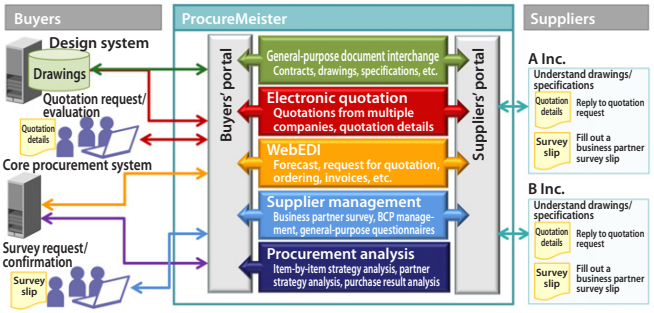
### Dy-free SmCo magnets

- Achieving high performance with Sm (Samarium), which can be sourced from multiple regions without using Dy (Dysprosium), a rare earth metal that is unevenly distributed to specific regions
- Realizing high output motors at a high temperature range of more than 150°C by using the thermal resistance of magnets



### Procurement solution ProcureMeister

- This solution for procurement divisions doing business with companies using the Internet reduces procurement costs, procurement lead time, and environmental impact at the same time




*1 At the time of product launch; The current position is not guaranteed. *2 Annual performance factor value in the 3 HP (horsepower) class, which is compatible with JIS B 8616:2015
*3 Phase change material (sheet) used as a thermal management solution

# Mitigation of Climate Change by Products and Services

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

## Reducing $CO_2$ emissions through the Greening of Products initiative

With a view to mitigating climate change, Toshiba Group is striving to reduce $CO_2$ emissions through the Greening of Products initiative aimed at developing products by setting eco-targets for mitigation of climate change to improve major environmental performance.

Toshiba Group's products cover a wide range of categories from consumer electronics to power generation plants, and $CO_2$ emissions from these products in different stages of their life cycle vary from one product to another. Under the Fifth Environmental Action Plan, we will continue to evaluate products throughout their entire life cycle. At the same time, we will focus our efforts on reducing environmental impact during customers' use of products, which has a large effect on the environmental efforts of Toshiba Group as a whole, and further enhance the annual $CO_2$ emissions reduction effect that may be achieved if conventional products are replaced by eco products.

**●Results of FY2014**

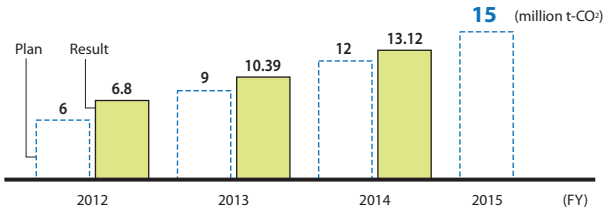
Since FY2010, we have set eco-targets regarding the mitigation of climate change in order to develop products with the highest level of environmental performance. In FY2014, we were able to reduce $CO_2$ emissions by 13.12 million tons per year by offering newly developed products throughout the world.

**●Future initiatives**

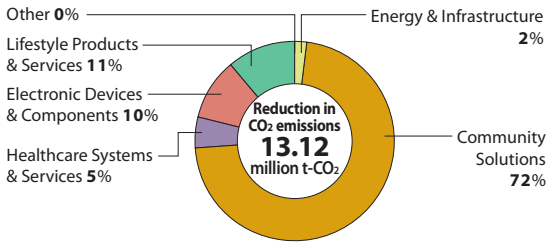
Toshiba Group will continue to reduce $CO_2$ emissions across all its products by identifying key factors that contribute to reducing $CO_2$ emissions and by sharing advanced examples and core technologies among group companies. At the same time, we will expand our business in global markets for home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

Through these measures, we aim to achieve a reduction in $CO_2$ emissions of 15 million tons by FY2015.

### ■ Changes in reductions in $CO_2$ emissions

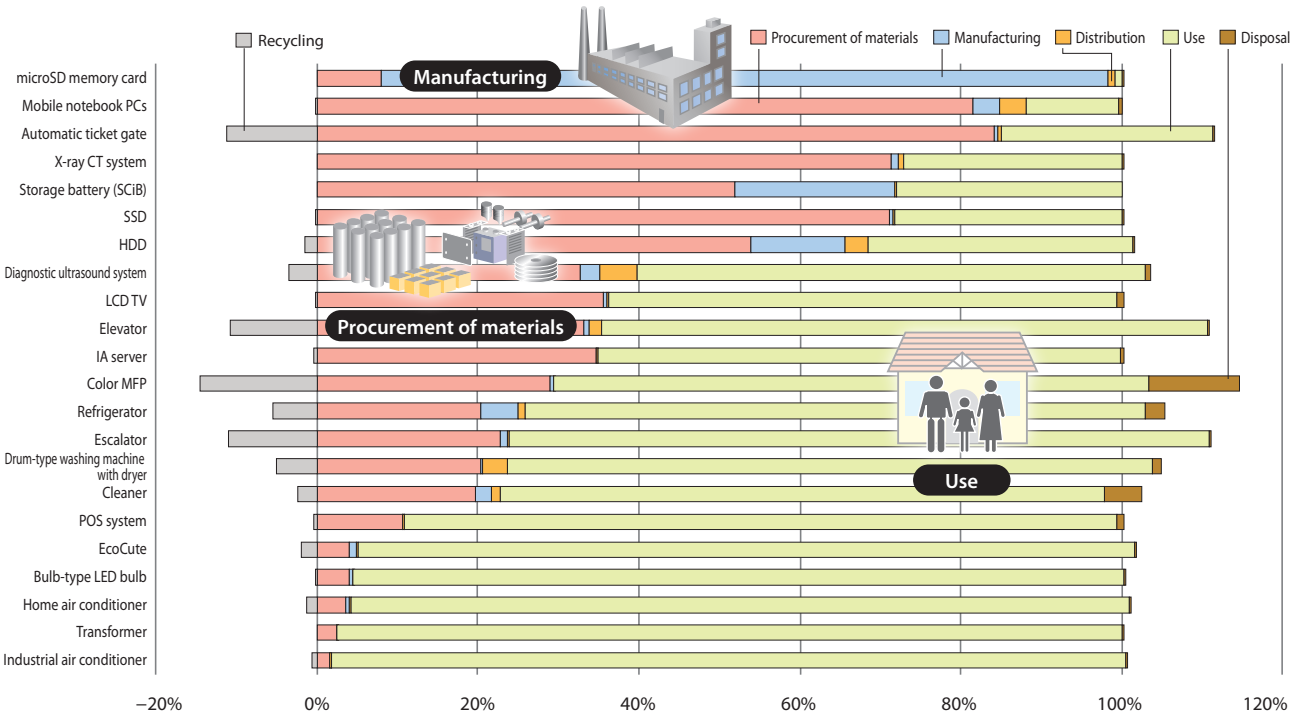



### ■ Breakdown of reductions in $CO_2$ emissions (FY2014)

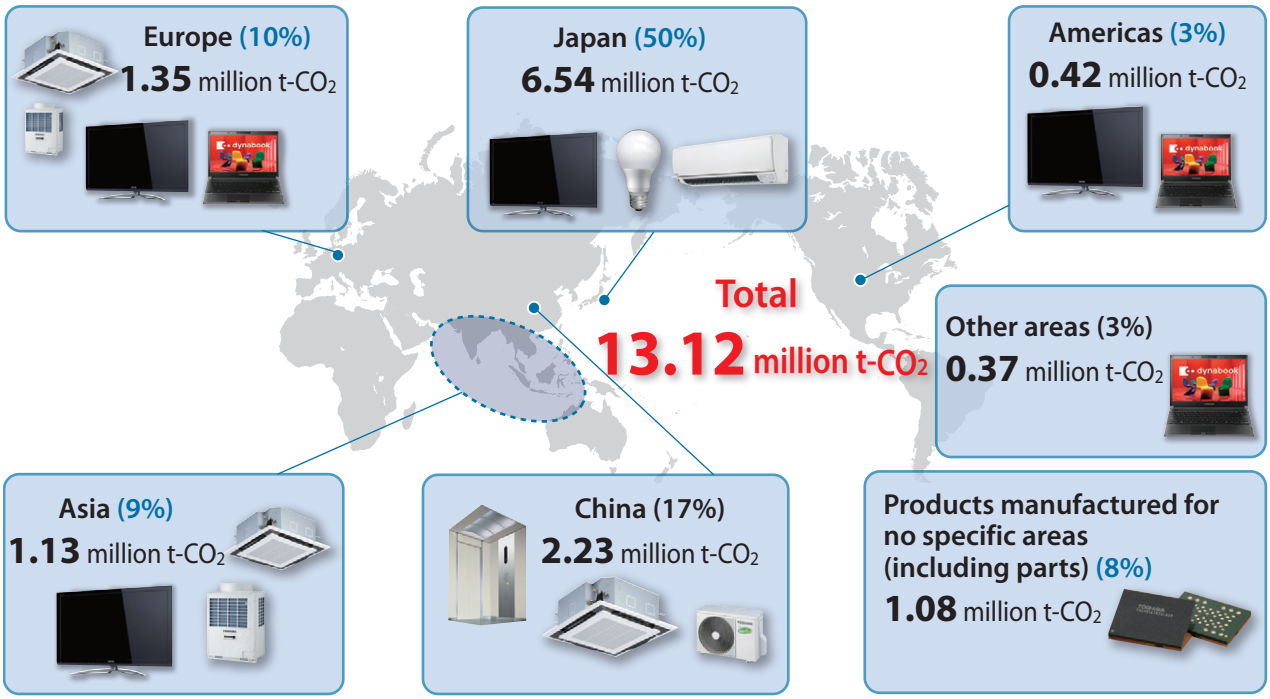



[By business segment]

### ■ Percentages of $CO_2$ emissions from the lifecycle stages of Toshiba Group's products



■ Breakdown of reductions in $CO_2$ emissions by area (FY2014)




## Case Study 1 SMARTRECEIPT® electronic receipt system

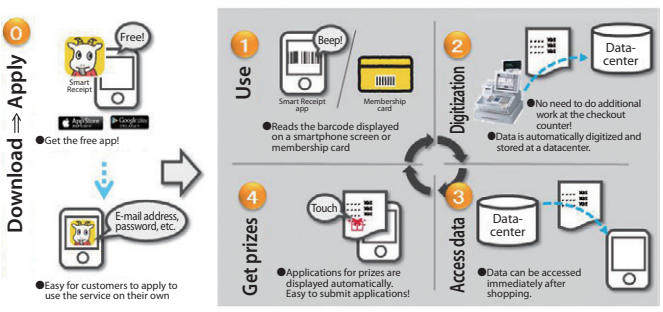
**Toshiba TEC Corporation**

SMARTRECEIPT® is a service that provides benefits to customers and also helps mitigate climate change.

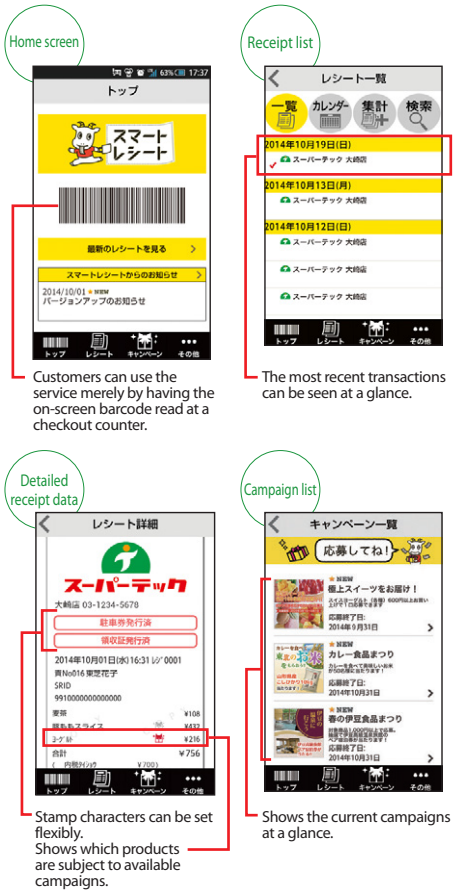
When a customer pays at the register, SMARTRECEIPT® digitizes the transaction data and manages it on a cloud server instead of printing a receipt. The service provides customers with electronic receipts by reading barcodes that are displayed in a smartphone application or by reading membership cards at checkout counters. After payment, customers can access their receipts at any time from any location via their smartphones.

In addition, the solution can also be used to provide services using electronic data, such as campaigns targeting customers who purchased certain products.

SMARTRECEIPT® utilizes datacenters and smartphones. By eliminating paper usage through digitization, it mitigates climate change and reduces resource consumption, thereby curbing $CO_2$ emissions by 13% according to our calculations for a model case.




■ Screen images



# Efficient Use of Resources

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

## Toshiba Group's 3R* initiatives for products

In order to create a 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, increasing incoming recycling and improving outgoing recycling. We are also taking measures to promote design for 3Rs of product and recycling systems and are implementing activities to reduce the environmental impact of our products throughout their life cycles.

* Reduce, reuse and recycle

**●Waste reduction**

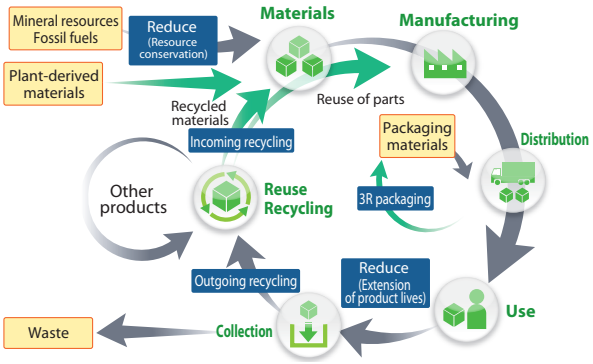
We achieve waste reduction through various means, including reducing the amount of resources used to manufacture products (reducing weight and size) and extending product lives (including upgrades and maintenance).

**●Incoming recycling**

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 reusable parts.

**●Outgoing recycling**

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.




## Increase in the percentage of resource savings

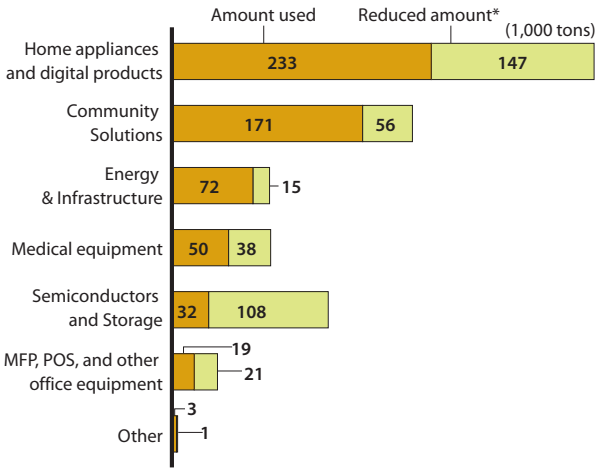
**●Results of FY2014**

Under the Fifth Environmental Action Plan, we aim to further increase the amount of resources reduced to 1.5 times the FY2010 level. In FY2014, 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 approximately 580,000 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 we have reduced the use of resources by 385,000 tons, or by 79% compared to previous product models. In addition to reductions in the size and weight of LCD TVs and other digital devices, this result is also due to reductions in industrial product resource consumption, including reductions in the sizes of medical equipment installation spaces as well as increases in the capacities of magnetic disks.

**●Future initiatives**

We will continue to promote resource-saving designs for all products with the aim of further reducing resource consumption.

**■Amount of resources used by Toshiba Group and reductions in resource consumption (FY2014)**




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

## Case Study 1 Automatic ticket gates

**Toshiba Corp. Social Infrastructure Systems Company**

The body width of the new EG-5200 automatic ticket gate has been reduced from 180 mm (the width of a conventional 2009 model) to 160 mm in order to increase the aisle width by 40 mm and to enable passengers to pass through gates more smoothly. We also performed a strength analysis using the finite element method (FEM) to minimize the thickness of the steel board, thereby reducing the gate's weight by 5%. In addition, we used a new material for the doors in order to minimize potential impact on the human body and to reduce the product's overall weight. We also reduced the number of motors and improved various parts, such as by integrating substrates, thereby reducing power consumption by 15%. Furthermore, we reduced the product's environmental impact throughout its life cycle by greatly reducing the number of man-hours as well as the period of time required for software development through recycling-oriented hardware design (certified as an Excellent ECP for FY2014).

## Increase in the use of recycled plastics

Toshiba Group is promoting initiatives to recycle plastic waste generated by end-of-life products.

**●Results of FY2014**

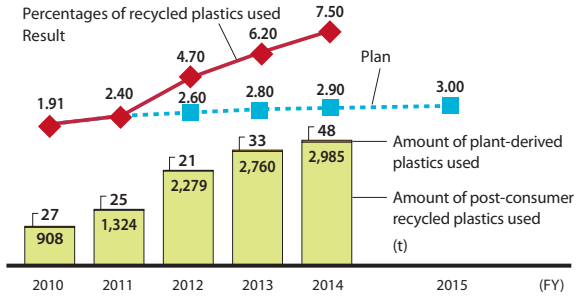
In addition to continuing to use recycled plastics for washing machines and vacuum cleaners, we made significant progress in using recycled plastics for refrigerators. We also expanded their use for industrial air conditioners as well as home air conditioners. As a result, we increased use of recycled plastics to approximately 3,000 tons in FY2014. The percentage of recycled plastics* used in Toshiba Group products was 7.5%, greatly exceeding the target of 2.9%. We are also using plant-derived plastics to manufacture some plastic parts for LCD TVs and POS systems.

**●Future initiatives**

In order to further increase the percentage of recycled plastics used in our products, we will secure a supply of waste plastics as well as develop new uses for recycled plastics in all product groups.

* [Amount of recycled plastics] / [Amount of plastics used for products] × 100

### ■ Amounts and percentages of recycled plastics used




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.

## Initiatives regarding water resources

Based on our environmental management concept T-COMPASS, we will develop solutions to reduce water resource consumption for products and services as well as to contribute to water resource management. The water footprint (WF: Water Footprint) concept is known as a tool for assessing the effects on water resources of products throughout their life cycles. In order to assess the effects of its business on water resources, Toshiba has started to estimate WFs for its products, an industry first.

**●Results of FY2014**

Toshiba Group participated as an international expert in establishing a standardization process for principles and requirements regarding WFs in ISO/TC207 (environmental management)/SC5 (life cycle assessment). To improve the practicality of the procedures, we presented our opinions from the perspective of industry. These international standards were established in July 2014 and were published as ISO 14046.

**●Future initiatives**

At ISO, TR-14073, which provides examples of WF calculations, is under discussion. We will continue to share our opinions from the perspective of industry. We will continue to improve our methods for assessing environmental effects and to expand the scope of assessment.

## 3R initiatives for packaging materials

We will streamline the use of packaging as well as product materials to reduce environmental impacts throughout their entire life cycles. In FY2014, Toshiba Group received an LCA Japan Forum Award for its activities to reduce use of packaging materials by employing LCA (p. 36). 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, enlarging the size of returnable (reusable) cases and using materials with low environmental impact.

## Case Study 2 Progress in sorting waste plastics

**Nishinihon Kaden Recycle Corporation**

In addition to product design initiatives, such as using recycled plastics for new product parts, Toshiba Group is also working to ensure sufficient supply of recycled plastics to expand their use. Nishinihon Kaden Recycle Corporation has developed and introduced a process for collecting high-purity, single material plastics from crushed mixed plastics. The process makes use of a near-infrared sensor to sort and separate ABS and HIPS resins. Then, brominated flame retardants are removed to ensure a supply of recycled plastics that meets the RoHS* Directive. In addition, a machine polishes the surfaces of collected plastics to further increase their purity. Recycled plastics obtained in this manner are used in home electrical appliances and other products.

**Removing foreign objects**

Removing urethane and other lightweight foreign objects and rubber

Wind sieve sorter

**Resin sorting**

Using a near-infrared sensor to sort and separate ABS and HIPS resins from mixed plastics

Near-infrared material sorter

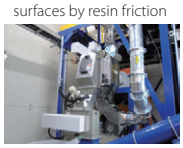
**X-ray sorting**

Using an X-ray sensor to instantly detect and remove ABS/HIPS flame retardants (Br) from raw materials

Sorter equipped with an X-ray detector

**Surface polishing**

Removing foreign objects (urethane seals) attached to surfaces by resin friction



Surface polisher

* RoHS (Restriction of certain Hazardous Substances) directive: A directive which limits the use of specified hazardous substances in electrical and electronic devices

# Management of Chemicals in Products

In addition to ensuring proper management of chemicals contained in products, Toshiba Group also promotes communication of information on such chemicals in order to minimize risks to human health and the global environment.

## Initiatives for the management of chemicals contained in Toshiba Group products

With a view to achieving the goal of minimizing risks involved in the use of chemicals in accordance with the precautionary principles, which was proposed and adopted at the World Summit on Sustainable Development (WSSD*1) and other conferences, Toshiba Group has been promoting initiatives to eliminate the use of specified chemicals, to reduce the amount of chemicals contained in products, and to use substitute materials. Toshiba Group manufactures and sells a wide range of product group, from electronic parts (e.g., semiconductors and hard disks) to home appliances (e.g., refrigerators, washing machines and air conditioners), audio-visual products (e.g., PCs and TVs), and social infrastructure products (e.g., medical equipment, transformers and weather radars). Various chemicals are used to manufacture these products. In recent years, regulations on the management of chemicals have become increasingly strict in countries around the world. For example, the EU revised the RoHS Directive*2 in January 2013 and the restriction of certain hazardous substances was expanded to all electric and electronic products. Furthermore, from July 2019, four kinds of phthalate esters (DEHP, BBP, DBP, and BBP) will be categorized as RoHS-prohibited substances, and a total of 10 kinds of chemicals will be designated as prohibited substances.

Under the European REACH regulations, aromatic hydrocarbons (PAHs) and other chemicals will be added as restricted substances. We are collaborating with local environmental divisions (in China, Southeast Asia, Europe, and the U.S.) to gather information on the latest trends in global chemical regulations.

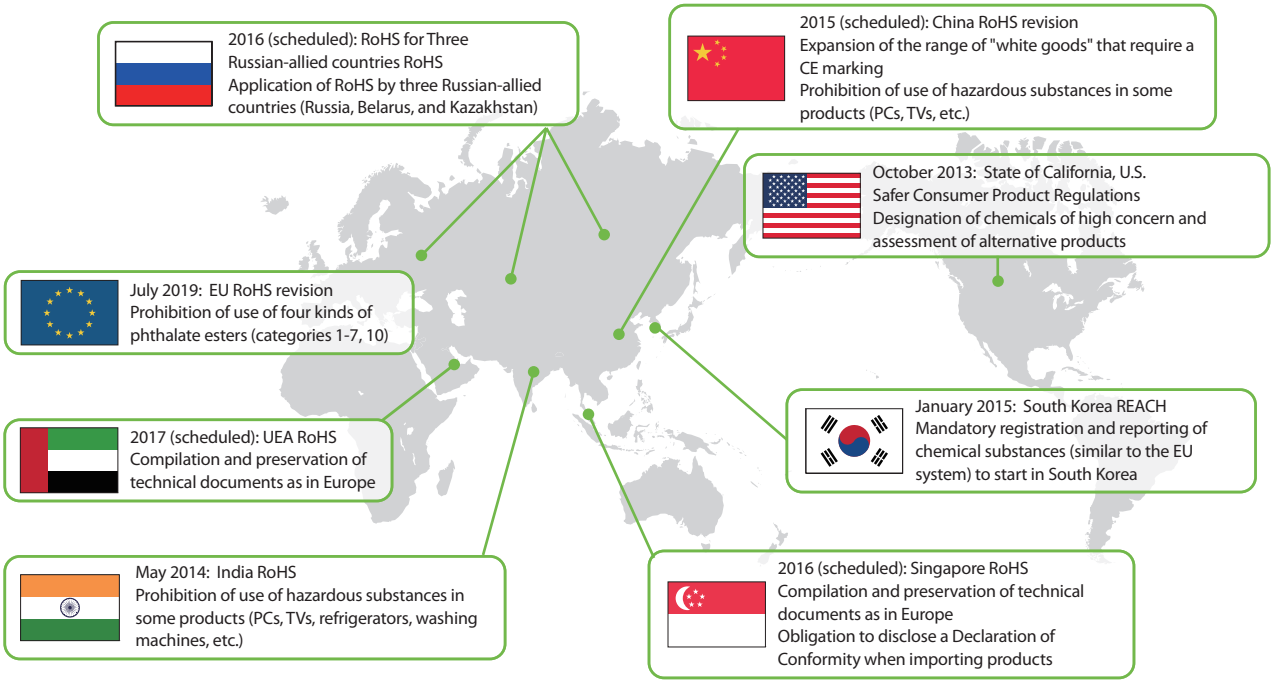
Also, to ensure legal compliance, Toshiba Group revised the Toshiba Group Green Procurement Guidelines on February 1, 2015 alongside the Toshiba Group Environment-related Substance List. We will add the four kinds of phthalate esters and aromatic hydrocarbons as rank-A substances (rank A: prohibited substances) with a view to ensuring legal compliance.

### ■ Toshiba Group Environment-related Substance List

| Category | Definition |
|---|---|
| Rank A (Prohibited Substances) | Substances whose presence is prohibited in procurement items (including packaging) in the Toshiba Group. Substances whose use in products (including packaging) is prohibited or restricted by domestic and foreign laws and regulations. |
| Rank B (Managed Substances) | Substances whose environmental impact should be reduced, based on their actual usage, via reduction of use and substitution, or recovery and detoxification in a closed system. |

Due to industry trends and other circumstances, details of the management of chemicals (substances managed, management levels, threshold values, etc.) may differ among Toshiba Group companies.

### ■Examples of regulations on chemicals contained in products in different countries




*1 WSSD: World Summit on Sustainable Development
*2 RoHS (Restriction of certain Hazardous Substances) directive: A directive which limits the use of specified hazardous substances in electrical and electronic devices

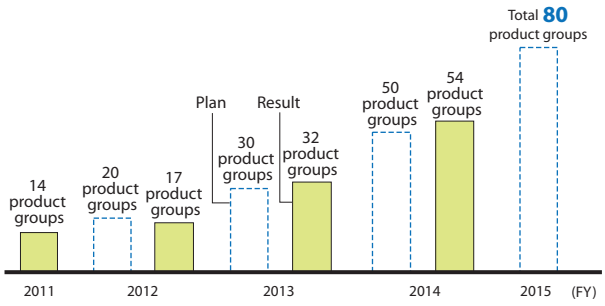
## Promoting use of alternatives to PVC/BFRs

**●Results of FY2014 and future initiatives**

In the Fifth Environmental Action Plan, which started in FY2012, we set a goal of using substitute materials to replace polyvinyl chloride (PVC) and brominated flame retardants (BFRs)[*3] contained in products across a total of 80 product groups in FY2015. In FY2014, we reduced the use of PVC and BFRs mainly in lifestyle products and achieved our goal for 54 product groups, exceeding the goal of 50 product groups (see the examples below).

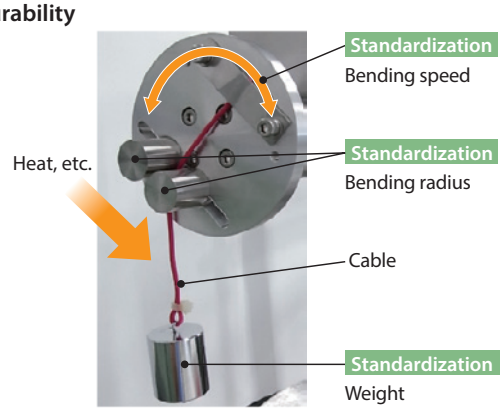
When replacing PVC and BFRs with alternatives, it is important to assess the reliability of alternative materials to maintain product quality. Toshiba Group has developed a technology for assessing the reliability of cable bending durability in order to facilitate replacement of PVC/BFRs with alternatives. More specifically, we use the method for testing cables shown in the photo below to evaluate the service lives of different types of cables. In particular, the results of our tests indicate that compared to conventional PVC cables, PVC-free cables vary greatly in bending durability from one manufacturer to another. By establishing standards for assessing bending durability for all Toshiba Group companies, we will share information on reliable PVC-free cables in order to promote use of alternatives to PVC/BFRs.

### ■Changes in product groups covered by the PVC/BFR substitution initiative

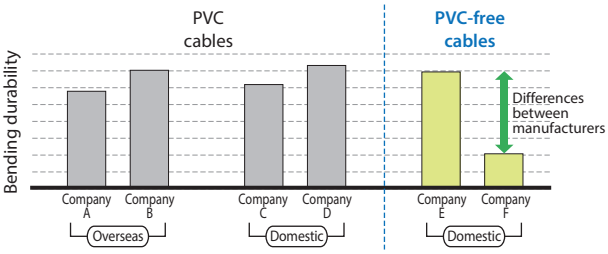



*3 Major restrictions regarding polyvinyl chloride (PVC)/brominated flame retardants (BFRs): PVC is an additive used to soften resin (generally known as a plasticizer) and is subject to restrictions in many countries.
Example 1: Phthalate esters (DEHP, BBP, DBP, and DIBP) in PVC: European RoHS Directive
Example 2: Organic tin compounds (DOP and DBP) contained in PVC: European REACH Regulations (substances subject to restrictions)
Example 3: Hazard assessments are currently performed in many countries for a variety of BFRs other than the specified flame retardants (e.g., PBDE and PBB) prohibited by the RoHS Directive.

### ■Standardizing the method for assessing cable bending durability




### ■Comparison of the bending durability of PVC and PVC-free cables




## Case Study 1 LED lighting

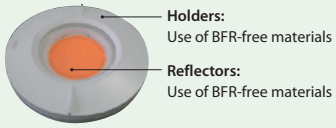
**Toshiba Lighting & Technology Corporation**

LED light engines and E-shape capped LED lamp are superior to conventional fluorescent lamps in terms of energy- and resource-saving performance. Also, some components are made of BFR-free materials that contain fewer chemicals.

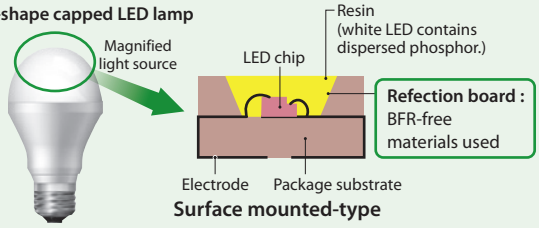
**●Use of BFR-free component materials**

To reduce use of BFRs, BFR-free materials are used in some components of LED light engine holders, reflectors, and reflector boards of E-shape capped LED lamp light sources.

**LED light engine**




**E-shape capped LED lamp**




**Surface mounted-type**

## Case Study 2 Microwave oven

**Toshiba Home Technology Corporation**

Toshiba ER-MD500/MD400 microwave ovens provide best-in-class energy-saving performance* and also reduce energy use by quickly preheating food at 200°C for approximately five minutes. PVC-free materials are used for the tubes that protect the inverters. Through use of water-soluble ceramic coating and other means, we reduced the amount of chemicals contained in component materials.

* Annual power consumption: 52.0 kW/year (measured by the method specified in the microwave oven section of the Energy Conservation Act)

**●Use of halogen-free materials**

PVC-free components used for high-voltage inverter lead wire protection tubes

**●Reduction in the use of fluorinated organic solvents**

The Easy-to-remove Coating designed for square-dish ovens is a water-soluble ceramic coating. To reduce the use of organic solvents (IPA), it contains no fluorine. Stains come off easily, eliminating the need for oven sheets, thereby contributing to reducing the amount of detergent used for cleaning.

**●Use of lead-free materials**

Lead-free solder used for PC boards

# Product Eco-efficiency

## Eco-efficiency

The concept of eco-efficiency was developed to realize a sustainable society by providing products and services designed to improve the quality of life while reducing environmental impact.

The Factor indicates the degree of improvement in eco-efficiency by comparing to a benchmark period. Factor values of 4 and 10 are widely known as the targets required to realize a sustainable society. The greater its Factor, the more a product contributes to creating value and reducing environmental impact through technological progress and innovation.

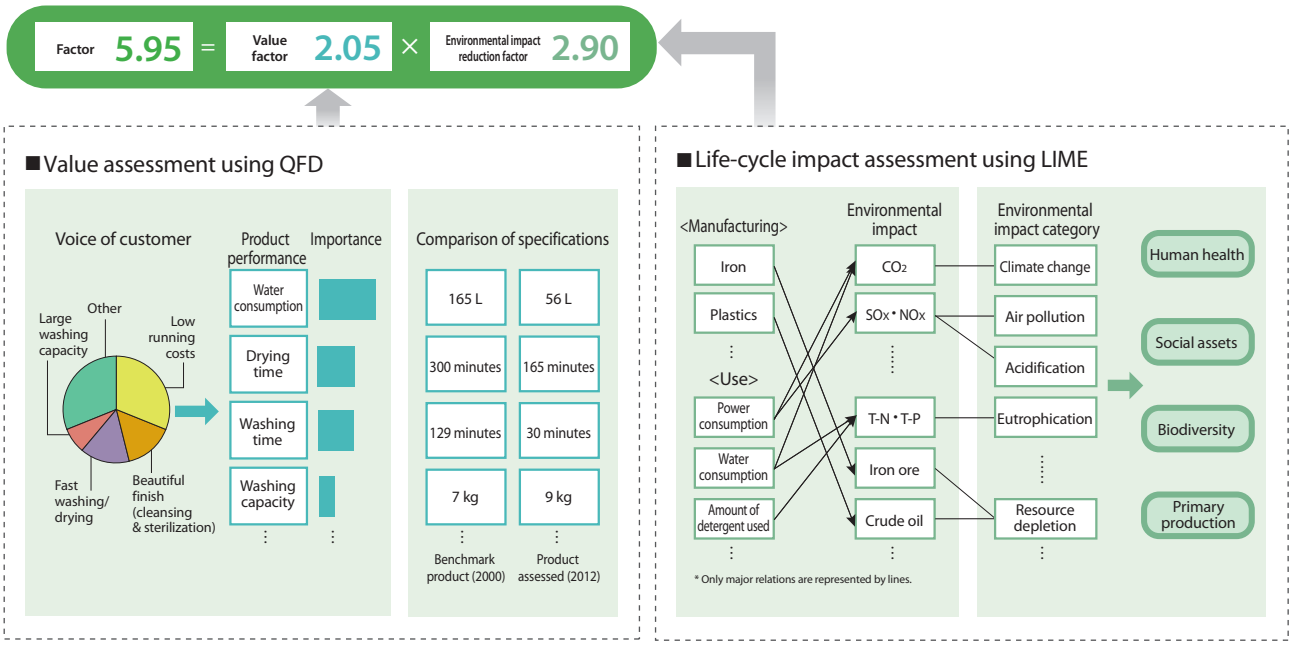
$$\text{Eco-efficiency} = \frac{\text{Value of product/service}}{\text{Environmental impact}}$$

$$\text{Factor} = \text{Degree of improvement in eco-efficiency compared to the benchmark period}$$

Toshiba Group originally developed a method for calculating eco-efficiency to introduce an indicator that enables overall assessment of products' environmental friendliness. Comprehensive activities for creating ECPs that are aimed at increasing the Factor are part of the Factor T initiative, so named after Toshiba's initial. Factor T has the following characteristics: (1) it is expressed as a multiplication of a value factor and an environmental impact reduction factor; (2) it quantifies the value of a product or service (numerator) using QFD; (3) it assesses environmental impact (denominator) using LIME*.

* 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 (AIST).

■ Factor T



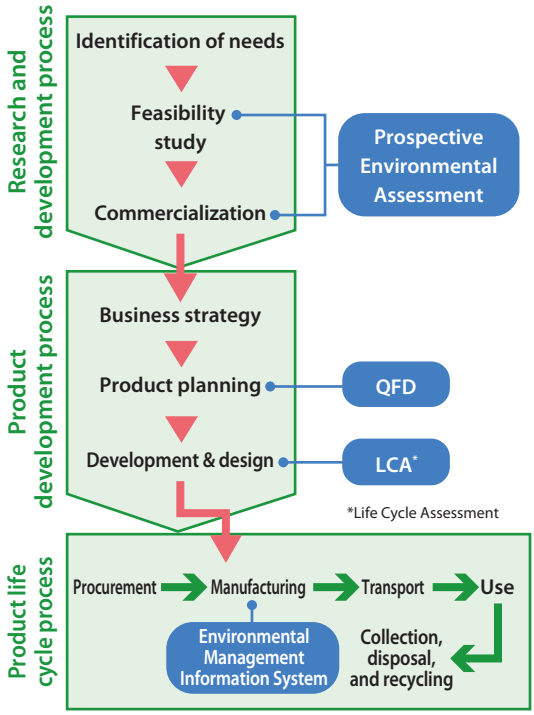

For detailed information about the calculation method and its application to Toshiba products, see the explanatory materials ("[Factor T] Reader" and "Encouragement of [Factor T].")
http://www.toshiba.co.jp/env/jp/factor_t/index_j.htm
http://www.toshiba.co.jp/env/jp/report/pdf/factor_t2012_2.pdf



These materials were awarded the Bronze Award in the 2013 Nikkei BtoB Advertising Award's product catalog (general) category.

The Factor T initiative was started in 2003. Under this initiative, we have carried out various activities involving parties inside and outside Toshiba Group, including the announcement of Environmental Vision 2050, formulation of Environmental Action Plans, conferences with competitors aiming at standardization, and contribution to the establishment of ISO standards. Toshiba Group will continue to pursue the Factor T initiative in order to work toward realizing a sustainable society by incorporating new knowledge.

## Development of LCA and the Concept of Eco-efficiency in Toshiba Group




**Factor T**

**Toshiba Group continues to promote the creation of ECPs by comprehensively considering the environment and value creation.**

- We screen environmental effects from the research and development stage before commercializing products, thereby promptly analyzing the risks involved and increasing our market competitiveness.
- By the end of FY2013, we completed the Factor assessment for all product groups. We are now measuring improvements in the eco-efficiency of all Toshiba Group's product groups. (For details, see p. 35.)
- We will also develop methods for assessing environmental impacts in new areas. (Column 1)

**Life cycle management**

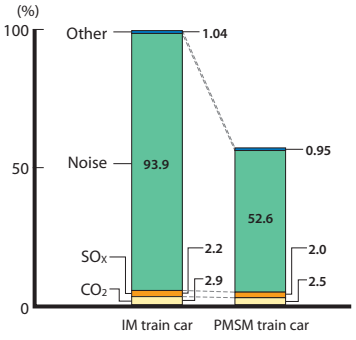
**Improvement in environmental performance throughout product life cycles**

- We measure business process eco-efficiency. We also develop measures to reduce the environmental footprints of products and organizations. (For details, see pp. 22 and 44.)
- Toshiba was awarded the 11th LCA Society of Japan Awards, Honorable Award. (Column 2)

## Column 1 Environmental Impact Assessment of Railway Rolling Stock Considering Motor Noise Effect

**Toshiba Corporation**

This figure compares the environmental impacts of a train car equipped with an induction motor (IM) and one equipped with a permanent magnet synchronous motor (PMSM) throughout their life cycles. To perform an integrated assessment of the impact of climate change, we quantified the effects of train cars on the health of residents living in areas along railroads. By using noise meters to measure the noise levels of motors during operation and by taking into account noise patterns based on operating conditions, we calculated the health effects of operating train cars for a total of 1.89 million km (service period: 20 years; railroad distance: 27.4 km; 16 hours during the day and 4 hours at night). The results of integrated assessment by LIME2 indicate that noise is the dominant effect and that the environmental impact of PMSM cars was 56% that of IM cars. We will continue to develop methods for measuring environmental impacts.




Takahashi et al. (2014), *Journal of Life Cycle Assessment Japan*, 10 (4), pp. 479-487.

## Column 2 Life-cycle assessment and utilization of wrapping/packaging materials for electrical and electronic products

**Toshiba Logistics Corporation/Toshiba Corporation**

Toshiba Group has developed and promotes methods for measuring environmental efficiency as well as for LCA that are suitable for various business areas. To reduce the environmental impacts not only of products and services but also of wrapping/packaging materials throughout their life cycles, we are working to improve loading efficiency and reduce $CO_2$ emissions by using Design for Logistics (DFL) as well as to sort wrapping materials based on LCA.

We gathered LCA data on various wrapping/packaging materials to help designers consider the differences in environmental impacts among wrapping materials. We developed life-cycle models for cardboard (two-sided and multiple two-sided), wooden crates, sealed plywood boxes, expanded polystyrene (EPS), expanded polyethylene (EPE), and polyethylene (PE) bags, all of which are used in large quantities by Toshiba Group as a whole. By conducting interviews with wrapping material manufacturers and using Toshiba Group's LCA database, we calculated the life-cycle $CO_2$ emissions for various materials. The results of our calculations are presented in the Wrapping Technology Handbook for Field Engineers, which is used inside the Group to develop eco-design guidelines for wrapping design. This year, Toshiba was awarded the 11th LCA Society of Japan Awards, Honorable Award for analyzing the consumption of wrapping/packaging materials by the Group as a whole, for using LCA to visualize $CO_2$ emissions, and for introducing measures to improve wrapping in various areas of our business. Toshiba Group has received the award for six years running, and seven times in total. We will continue to perform LCA, which contributes to business development.

# Contributing to a stable power supply and mitigation of climate change through low-carbon energy technologies

INDEX

## Summary of activities in FY2014



## Toshiba Group's Approach in the Energy Sector

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 the area of main energy, which supports our lives, we are working to develop technology for thermal and nuclear power generation. At present, we depend on fossil fuel for about 80% of the global energy supply, but thermal power generation emits more $CO_2$ than other power generation methods because $CO_2$ is produced when fossil fuels are burned. Therefore, we must step-up efforts to take measures to mitigate climate change by introducing the most advanced technology.

In addition to emitting less $CO_2$ than methods using other types of fossil fuel, the importance of power generation using gas for fuel is increasing because shale gas is now available. Combined cycle thermal power generation, which fuses cutting-edge, high-efficiency gas turbine and high-performance steam turbine with a power generator, is a thermal power generation system that is more efficient than conventional types, and Toshiba is actively promoting the power generation equipment it has developed, which is the most efficient in the world.

Coal has a higher reserve-production ratio than other types of fossil fuel; for economic reasons, coal-burning thermal power generation is expected to be introduced widely throughout Asia and other regions in the years to come. In order to mitigate climate change, it is important to introduce high-efficiency power generation equipment. Toshiba Group is striving to further improve the efficiency of coal-burning thermal power generation by working to realize coal-burning thermal power generation plants using advanced ultra-supercritical (A-USC) steam turbines by developing materials that can withstand high temperatures of 700°C and carrying out tests to verify the strength of turbine equipment.

Furthermore, the Group is working to develop test equipment for use in growing agricultural products by capturing $CO_2$ from incineration plants' exhaust gases as we strive to commercialize carbon capture and storage/carbon capture and utilization (CCS/CCU) technology. We are also working to develop a new thermal power generation cycle to make $CO_2$ capture easy. In these ways, we are pushing forward with the development of next-generation thermal power generation technologies.

On the other hand, nuclear power generation, which does not emit $CO_2$ when generating electricity, is positioned as an "important base-load electricity source" in the Japanese government's Basic Energy Plan. Toshiba Group has been involved in the construction of 112 nuclear power plants in 10 countries worldwide. In the United States and China, construction of new nuclear power plants is underway, and Toshiba Group is actively working to supply large-scale nuclear power generation equipment. At the Fukushima Daiichi Nuclear Power Station, we will contribute to initiatives for decommissioning the nuclear reactors, such as developing multi-radioactive nuclides removal systems to purify contaminated water quickly, using a remote-controlled robot to assess the site's condition, and removing debris from fuel pools.

Introducing renewable energy is a rising trend as we strive to mitigate climate change and cope with the depletion of fossil fuel resources. Toshiba Group has developed various power generation technologies, including those for photovoltaic, hydroelectric, geothermal, and wind power generation; we have delivered many systems using such technologies to our customers. We will work to further improve the efficiency of these technologies and systems as well as promote their proliferation.

In the area of hydroelectric power generation, in which we have delivered our systems in 40 countries worldwide, we are actively working to develop pumping-up power generation systems, which are effective for taking countermeasures against daytime peak electricity demand, as well as small hydroelectric power generation systems. In this way, we will continue to utilize hydroelectric power generation, the most widely used type of renewable energy.

We are also actively working to develop technology for wind power generation systems, which are expected to be introduced widely in the future, and photovoltaic power generation systems, which are coming into widespread use. Regarding photovoltaic power generation, we are striving to spread high-efficiency photovoltaic power generation systems ranging from large photovoltaic power plants, which have been introduced in greater numbers since the feed-in tariff system for renewable energy began, to those for industrial and residential use.

Going forward, as energy demand is expected to increase in emerging economies, Toshiba Group will continue to contribute to the realization of low-carbon societies at the global level by offering high-efficiency power generation equipment and helping expand supplies of renewable energy.

Since power generation using renewable energy is often affected by weather conditions and it is difficult to consistently obtain a fixed level of output, the effects of such power generation on the electric power system become a problem as the amount of electricity generated using such systems increases. To solve this problem, Toshiba Group is actively developing and commercializing stationary storage battery systems that combine monitoring and control technology (EMS) with storage batteries.

In the area of power transmission and distribution, which helps supply electricity to users such as factories, offices, and residences in a stable manner, Toshiba Group is working to develop a wide range of technologies based on know-how acquired through many test projects with the aim of realizing smart grids (next-generation power transmission and distribution systems), which are intended to optimize the balance between energy supply and demand mainly through effective use of renewable energy. Moreover, as an extension of these efforts, we will contribute to the realization of smart communities featuring water supply, gas supply, and transportation systems---this is the vision of communities that we aim to create in the future with smart grids.

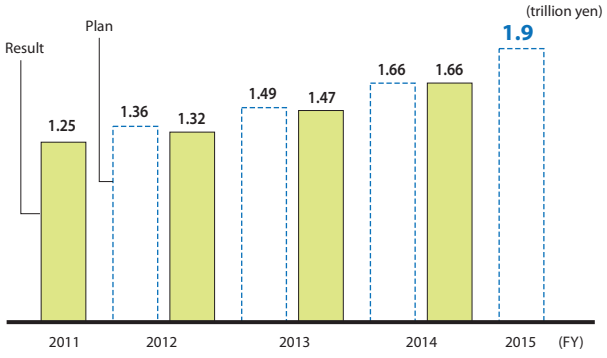
## Aiming to increase sales of energy-related products to 1.9 trillion yen and reducing $CO_2$ emissions by 490 million tons in FY2015

The Fifth Environmental Action Plan calls for Toshiba Group to address two indicators in the energy sector: the amount of $CO_2$ emissions of energy-related products and sales of energy-related products.

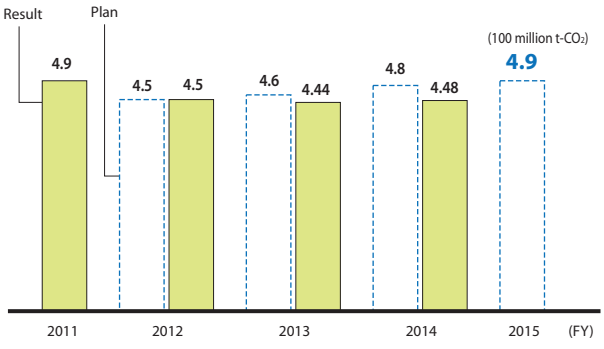
**●Results of FY2014 and future initiatives**

While we are making progress mainly by increasing $CO_2$ emissions reductions through high-efficiency thermal power generation, some goals have not been attained due to delays compared to initial plans with respect to the start of operation of plants under construction. However, we aim to increase sales of energy-related products to 1.9 trillion yen and reduce $CO_2$ emissions by 490 million tons in FY2015 by spreading high-efficiency thermal power generation and renewable energy, mainly through delivery of a combined cycle thermal power generation system to the Ishikari Bay new port power plant in Hokkaido and a power generation system to a geothermal power plant in Turkey. In this way, we will contribute to ensuring a stable power supply and mitigation of climate change.

### ■Sales for energy-related products




### ■Reduction in $CO_2$ emissions through energy-related products



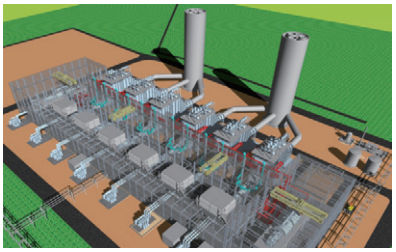
# Generating Energy: Power generation technologies for preventing the global warming

For stable electric power supply and global warming prevention, Toshiba Group is developing technologies to reduce a $CO_2$ emission of thermal power as well as developing and spreading renewable energy technologies such as hydroelectric, geothermal, wind, and photovoltaic power. The Group is also making sustained efforts to develop technologies for safety of a nuclear power.

## Thermal Power

### Combined-cycle power generation system with the world's highest level of efficiency (62%)

Combined cycle thermal power generation is a power generation method that combines gas turbines and steam turbines. By using exhaust gas energy, the combined cycle thermal power generation system improves efficiency and reduces $CO_2$ emissions per kilowatt-hour of electricity compared with coal-fired conventional thermal power generation. Having developed a thermal power generation system with the world's highest level of efficiency (62%) (lower heating value basis), Toshiba won an order from the Chubu Electric Power Company and is now building a system for the Nishi-Nagoya thermal power station. In addition, we recently won an order for thermal power generation equipment for the Hokkaido Electric Power Company's Ishikari Bay new port power station.
We will continue to further improve efficiency and contribute to reducing $CO_2$ emissions.



Overview: Combined cycle thermal power plant

### Commercialization of carbon capture technology

In order to commercialize technology for capturing $CO_2$ from exhaust gas emitted from thermal power plants, Toshiba Group is planning to build commercial plants and proposing applications of our system to potential customers based on know-how gained through over 8,100 hours of verification tests at the Mikawa pilot plant in Fukuoka Prefecture. In October 2012, as part of the Plant Biomass Energy Utilization Project for Saga City's Incineration Plant, we delivered test equipment to capture $CO_2$ from the incineration plant's exhaust gas for use in growing agricultural crops and algae.
This equipment enables the plant to capture $CO_2$ at a purity rate of over 99%, one of this technology's distinctive features.

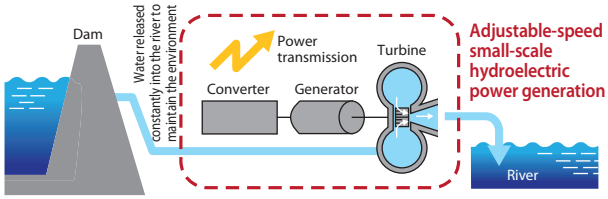
Carbon capture system for verification

## Hydroelectric Power

### Aiming to become the world's foremost eco-company regarding renewable energy

Toshiba Group has delivered about 2,000 units of both turbines and generators, totally over 56 GW of hydroelectric power generation equipment, to more than 40 countries around the world. We have the world's best-in-class technologies and achievements for pumped storage systems, in which water is pumped up using surplus power during nighttime and power is generated during daytime to offset power-demand peaks, as well as for adjustable speed pumped storage systems that are effective in power system stabilization. We also take an active part in developing small hydroelectric system technologies to make effective use of hydroelectric energy. We have developed adjustable-speed small hydroelectric power generation systems to effectively use specific amounts of water* released constantly into a river from dams where the water level fluctuates substantially. Our micro hydroelectric power generation system Hydro-eKIDS™ has also been well received. In the future, we will continue to develop and promote the use of hydroelectric power generation, the most frequently used type of renewable energy, by offering a wide range of product lineups, from large-capacity to small hydroelectric systems.

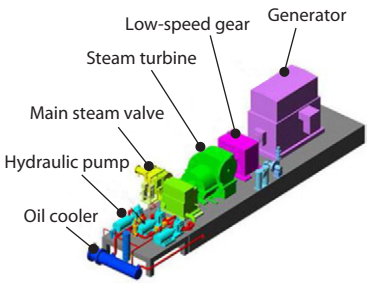
■Adjustable speed small hydroelectric power generation system




* To maintain the environment downstream of dams, a specific amount of water is constantly released into the river from the dams even during periods other than floods and irrigation.

## Geothermal Power

Toshiba Group delivers facilities equivalent to 23% of the world's total geothermal power generation capacity. Based on the temperature properties of geothermal sources, we provide optimal geothermal power generation systems, including flash steam systems, binary cycle systems, and flash-binary systems that use the two systems in combination. We also promote the use of Geoportable™, a newly developed 2-MW compact geothermal power generation system. Wellhead Geothermal Power Generation System has a small footprint and contributes to effective use of untapped geothermal energy in locations with only one or two geothermal wells.
At present, we are building large-capacity geothermal power plants in Kenya, Indonesia, and Turkey.




Compact geothermal turbine generator

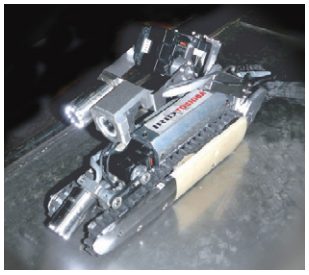
## Wind Power

Shin-Nagashima Kuronoseto Wind Power Station

Toshiba Group provides the optimized solution from site planning, construction, commissioning, to operations & maintenance. Toshiba also promotes the wind farm control and wind - battery system to maximum power generation and to minimize power fluctuation. We delivered two 2-MW windmills to the Shin-Nagashima Kuronoseto Wind Power Station (Nagashimacho, Imizugun, Kagoshima Prefecture); they commenced operation in March 2015. This power station aims to improve power generation efficiency by employing plasma aerodynamic control technology.

## Nuclear Power

### For expanding the use of safe, secure nuclear power with technologies that provide the world's highest level of safety



Robot developed by Toshiba and IRID* to survey the insides of nuclear reactor containments

Working in cooperation with its group companies, including Westinghouse, Toshiba Group is striving to the utmost to stabilize the operation of the Fukushima Daiichi Nuclear Power Station, which was seriously damaged by the March 11, 2011 earthquake, as well as to facilitate the decommissioning of the nuclear reactors in addition to supporting the reopening of the power station as a facility that provides the world's highest level of safety based on lessons learned from the accident.

At the Fukushima Daiichi Nuclear Power Station, we are collaborating with the government and Tokyo Electric Power Company (TEPCO) to manufacture and install reliable welded tanks that can purify contaminated water quickly and store treated water safely, thereby maintaining operational stability. We are also contributing to facilitating the decommissioning of the nuclear reactors, including developing a robot that surveys inside nuclear reactor containments as well as introducing fuel processing facilities.

To reopen Japan's existing nuclear power plants, Toshiba Group is working steadily to build facilities to prevent severe accidents and ensure safety in compliance with new nuclear regulations. We are also undertaking initiatives to develop technologies that can provide a sense of security by evaluating the effectiveness of safety measures and safety improvements in an easy-to-understand way. In addition, Toshiba Group is also actively developing safety technologies, including fuel pool water level meters, and plant maintenance technologies that make use of laser peening for nuclear power stations overseas.

Meanwhile, to meet growing energy demand worldwide, Westinghouse Electric Company is constructing new plants in China and the United States, each with four advanced pressurized water reactors (AP1000™).

Toshiba Group will continue to make concerted efforts, both in Japan and overseas, to expand the use of safe, secure nuclear power.

* IRID: International Research Institute for Nuclear Decommissioning

AP1000™ construction site

## Photovoltaic power generation

### Promoting the use of high-efficiency photovoltaic power generation systems for power plants, factories, and homes

In order to contribute to the mitigation of climate change and effective use of limited fossil fuel resources, countries around the world are promoting the use of photovoltaic power generation; in Japan, too, public-private partnerships for its wider use are in progress.

Toshiba Group contributes to reducing $CO_2$ emissions by promoting use of photovoltaic power generation systems that achieve the highest level of efficiency and long-term stability in power plants, factories, and homes.

Toshiba Group provides total support for industrial photovoltaic power generation systems, from system development to construction and maintenance. We make the most of the comprehensive engineering capabilities we have cultivated through our years of experience, such as construction of mega solar systems for electric power companies. Thus, our mega solar systems achieve the highest level of efficiency and long-term stability. Boosted by the tailwind of the feed-in tariff system for renewable energy, which started in July 2012, we have delivered large-scale photovoltaic power plants such as Tahara City's joint solar and wind project (50 MW). We are also increasing sales of solar battery modules for other contractors responsible for engineering, procurement, and construction of photovoltaic power plants, thereby contributing to reductions in $CO_2$ emissions.

In the area of residential photovoltaic power generation systems, we began selling a 250-W solar battery module with the world's highest conversion efficiency, 20.1%, in December 2012. The conversion efficiency of this module has already exceeded the 2020 goal (20%) for service modules set by NEDO in the photovoltaic power generation roadmap. Thanks to its high efficiency, Toshiba's system that uses this globally leading module generates a large amount of power per area, thereby further contributing to reducing $CO_2$ emissions.

250-W solar battery module

# Storing Energy: Power generation technologies for preventing the global warming

In order to ensure a stable power supply when large amounts of renewable energy, such as photovoltaic and wind power generation, are introduced, we are developing and providing diverse storage battery solutions with SCiB™ rechargeable batteries.

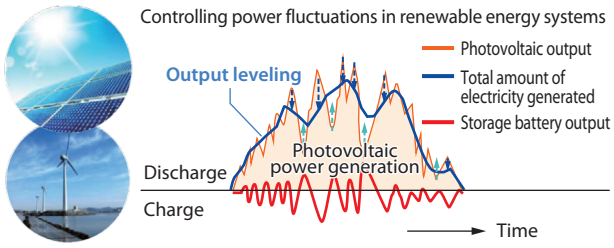
## Stationary storage battery systems, an important trump card for spreading renewable energy

Power generation with renewable energy such as wind and photovoltaic power rather than fossil fuels is attracting public attention as a means of mitigating climate change and is actively being introduced in Japan as well as in overseas countries, especially in Europe. Since power generation using renewable energy is often affected by weather conditions and it is difficult to consistently obtain a fixed level of output, the effects of such power generation on the electric power system become a problem regarding, for example, fluctuation in voltage and frequency, as the amount of electricity generated using such systems increases. To solve this problem, Toshiba Group is actively developing and commercializing stationary storage battery systems that combine monitoring and control technology (EMS) with storage batteries.

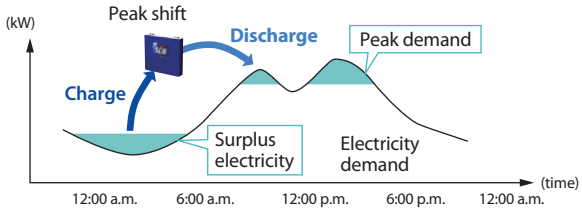
## Smart battery solutions to contribute to a stable power supply

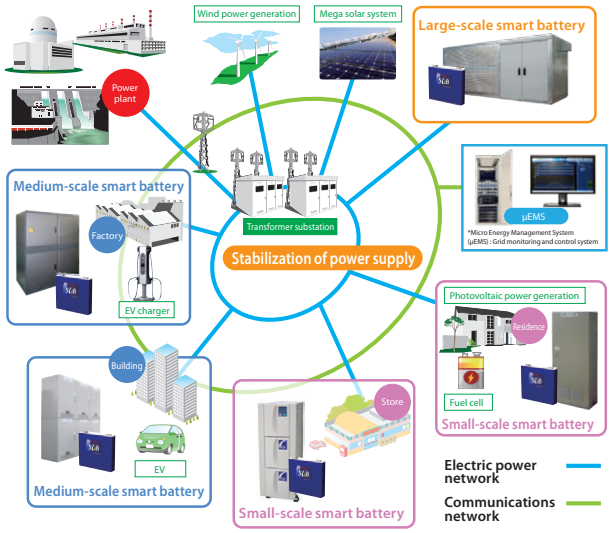
Smart batteries™ are part of the stationary storage battery system proposed by Toshiba. Toshiba's SCiB™ rechargeable lithium ion batteries control sharp output fluctuations through smooth absorption when renewable energy systems are linked, achieving load leveling through peak shifts and peak cuts by charging the batteries during the night when demand is low and discharging electricity during the day when demand peaks. Thus, they are highly scalable, covering a wide range of systems including those offered for commercial, industrial, and residential use as well as large-scale electric power systems. As we strive to mitigate climate change, we will contribute to the realization of a low-carbon society by providing smart battery solutions that combine multiple smart batteries™.

### ■Electric power system-side solutions




### ■Consumer-side solutions




### ●Large storage battery systems

We delivered a large storage battery system designed to handle frequency changes for verification tests conducted by Tohoku Electric Power Company in order to expand use of renewable energy as part of a government subsidy project. The system commenced operation in February 2015.

We installed this storage battery system at the Nishi-Sendai Power Substation. With a maximum output of 40 MW and a capacity of 20 MWh, it is one of the world's largest storage systems to use lithium-ion storage batteries.

Storage battery system for the energy supply-demand control system

### ●Home storage battery systems

This stationary home storage battery system has a capacity of 6.6 kWh*1 and a maximum power output of 3.0 kVA*2. It can be rapidly charged in about two hours. This storage system not only supplies electricity to electrical appliances in the home*3 but also responds to sudden power failures and helps reduce power consumption during peak daytime hours by using electricity that is stored at night. When combined with photovoltaic power generation or an HEMS, this system contributes to daily power savings and reduction of $CO_2$ emissions*4.

*1 The amount of electricity that can actually be used by electrical appliances is reduced due to power conversion loss (about 6% at the time of rated output).
*2 This indicates rated output during normal use. The maximum power output is 2.0 kVA during a power failure; AC 100 V of electricity is supplied to selected loads.
*3 During a power failure, AC 100 V of electricity is supplied to selected loads
*4 There are cases in which $CO_2$ emissions cannot be reduced depending on how the electricity is used.

# Distributing Energy

As a comprehensive manufacturer of electric machinery, Toshiba Group provides the most advanced, optimal total energy solutions that combine products and systems across a wide range of areas, from power transmission/distribution systems to office buildings and housing, thus contributing to the realization of a low-carbon society.

## Next-generation energy supply-demand control system developed by Toshiba Group, which plays a leading role in verification tests

Smart grid technologies are attracting attention as technologies for using renewable energy which are likely to be used more widely in the future. 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. Toshiba Group is working to commercialize community-wide energy control systems by combining output control functions that use storage batteries with functions for forecasting energy supply and demand.

For example, in the US state of New Mexico, a new initiative encouraging consumers to stabilize the system is underway; verification tests for demand response (DR[*1]) to maintain supply-demand balance by controlling electricity demand through consumer cooperation have already begun. We are also working to develop a standardized supply-demand control system for island countries/areas, where it is difficult to maintain balance between supply and demand.

## Contributing to the world with a wide range of solutions

Based on the power distribution technologies that it has developed in the past, Toshiba Group provides various smart grid-related solutions.

**●Grid monitoring/control device (µEMS[*2])**

The Micro Energy Management System (µEMS) is a core product that serves as the brain of a smart grid by monitoring and controlling the local supply and demand of electricity; this system ensures effective use of renewable energy and a more stable electricity supply. It improves overall energy efficiency by controlling electricity supply and demand, including absorbing variations in power consumption within a grid and minimizing the effects of these variations on the electricity network. It becomes particularly important to accurately forecast and control electricity supply and demand with the introduction of photovoltaic power generation and large-scale transportation systems that feature electric vehicles, which may change the demand side considerably. µEMS provides automatic control of electricity supply and demand while monitoring and forecasting electricity demand in real time.

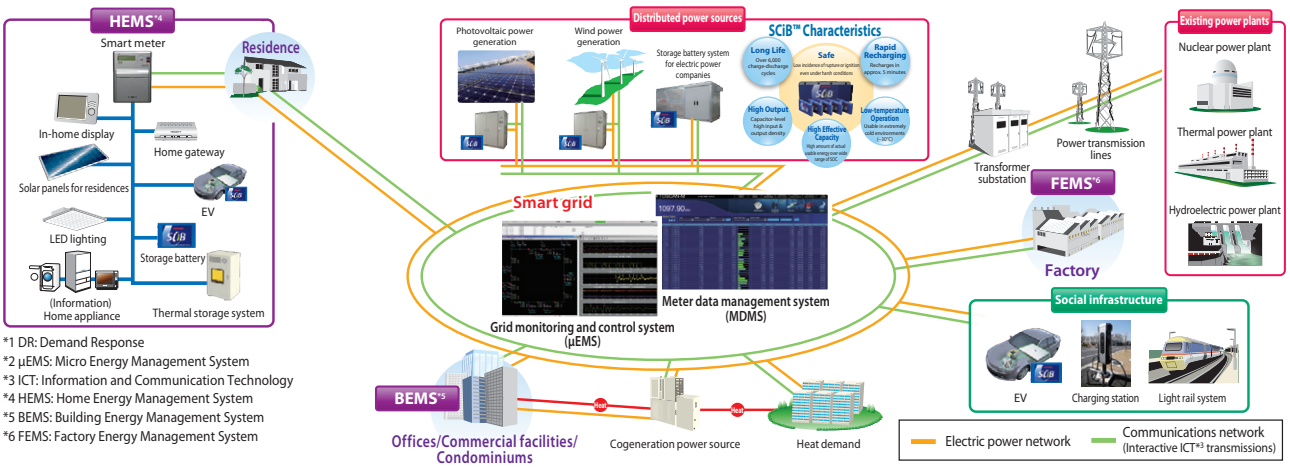

Toshiba Group is working to commercialize an energy supply system that generates hydrogen from renewable energy, which it stores for use to generate electricity. The grid monitoring and control system optimizes system operation by controlling water electrolysis devices, fuel cells, and other devices based on predicting the amount of power generation and demand for power and hydrogen.

**●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 detailed data on power consumption in buildings and houses and transmit such data to power utilities via the network. Users can also obtain information on their power consumption charges in real time. Smart meters also enable users to use energy effectively (in conjunction with energy-saving and new energy devices) by measuring the amount of power consumption of connected Home Energy Management System (HEMS) devices installed in their homes via 920-MHz Wi-Fi or power line communication (PLC).

Toshiba Group won an order from Tokyo Electric Power Company for a communication system for smart meters; in April 2014, installation and operation of the smart meter system built using Landis+Gyr AG's international standard communication technologies, which have a proven track record, began. In the future, smart meters will also be used to realize demand-response technologies, which are attracting attention as a means of alleviating power shortages and of effectively using renewable energy. To this end, Toshiba Group is conducting verification tests in the Yokohama Smart City Project to meet the OpenADR standards, which are the most closely related to international standards for automatic demand-response technologies.

**■Smart grids, next-generation power distribution networks**




*1 DR: Demand Response
*2 µEMS: Micro Energy Management System
*3 ICT: Information and Communication Technology
*4 HEMS: Home Energy Management System
*5 BEMS: Building Energy Management System
*6 FEMS: Factory Energy Management System

# Pursuing the world's lowest level of environmental impacts through high-efficiency manufacturing

INDEX

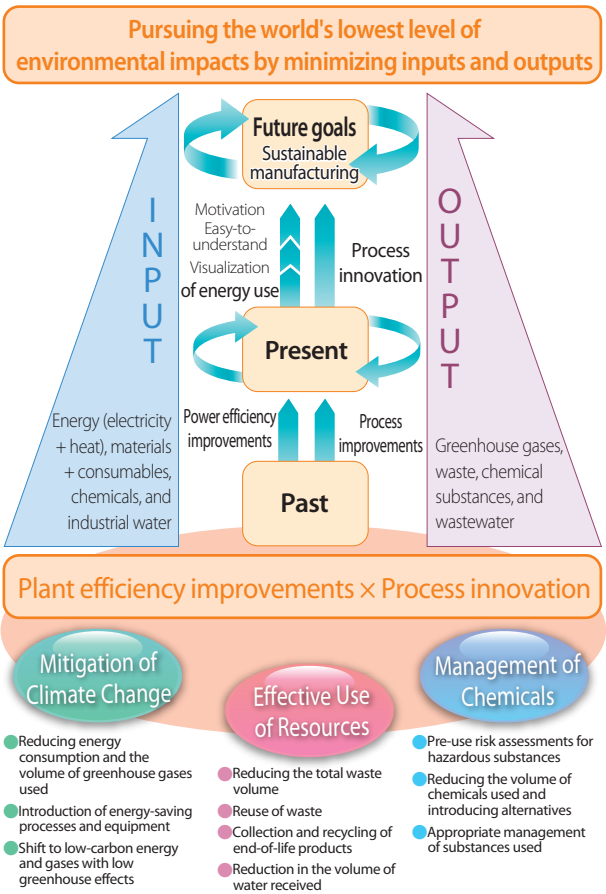
## Summary of activities in FY2014



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

Toshiba Group is promoting Greening of Process, an initiative for high-efficiency manufacturing, which aims to minimize resource inputs in production processes in Japan and abroad, eliminate waste in manufacturing processes, and reduce to a minimum emissions into the atmosphere and waters, thus achieving the world's lowest level of environmental impacts. Specifically, this initiative consists of two efforts: "improvement of plant efficiency," which refers to efforts to grasp energy consumption appropriately in order to ensure effective improvement of equipment operation and introduce high-efficiency equipment, and "process innovation," which aims to achieve sustainable manufacturing in collaboration with all units involved in manufacturing.

### ■High-efficiency manufacturing



Toshiba Group is promoting the Greening of Process initiative from three perspectives: mitigation of climate change, effective use of resources, and management of chemical substances. In terms of mitigation of climate change, Toshiba Group is actively taking energy-saving measures on a company-wide scale. We will grasp energy consumption in real time (visualization), analyze data (easy-to-understand), and take actions for improvement (motivation). We will also perform energy-saving analyses worldwide and evaluate the potential of improvements to further reduce energy consumption. In terms of effective use of resources, we will continue to make maximum use of our ingenuity to reduce the total volume of waste generated and final waste disposal volumes as well as strive to use valuable water resources effectively. As for management of chemicals, the Group will make efforts to reduce the amount of targeted substances handled and discharged mainly through the introduction of alternative substances and process improvements. In the future, we will endeavor to achieve the world's lowest level of environmental impacts by realizing high-efficiency manufacturing that enhances our business competitiveness.

## Increasing business process eco-efficiency to 1.5 times the FY2000 level in FY2015

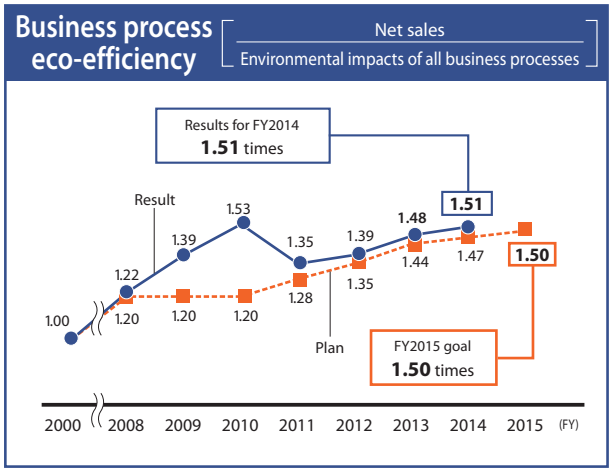
Toshiba Group, which comprehensively assesses the effects of environmental impacts in its business operations, views business process eco-efficiency as an important indicator of high-efficiency manufacturing and is working to reduce environmental impacts in manufacturing processes.

**●Results of FY2014**

Sales increased in FY2014 compared to the previous year. However, due to reductions in GHG emissions through energy-saving efforts and other factors, business process eco-efficiency improved compared to the previous year to 1.51 times (in comparison with the FY2000 level), exceeding the goal of 1.47 times.

**●Future initiatives**

The goal of the Fifth Environmental Action Plan is to increase business process eco-efficiency to 1.5 times compared to the FY2000 level in FY2015. To achieve this goal, Toshiba Group will work to reduce environmental impacts according to the nine specific targets (refer to page 20 for details).

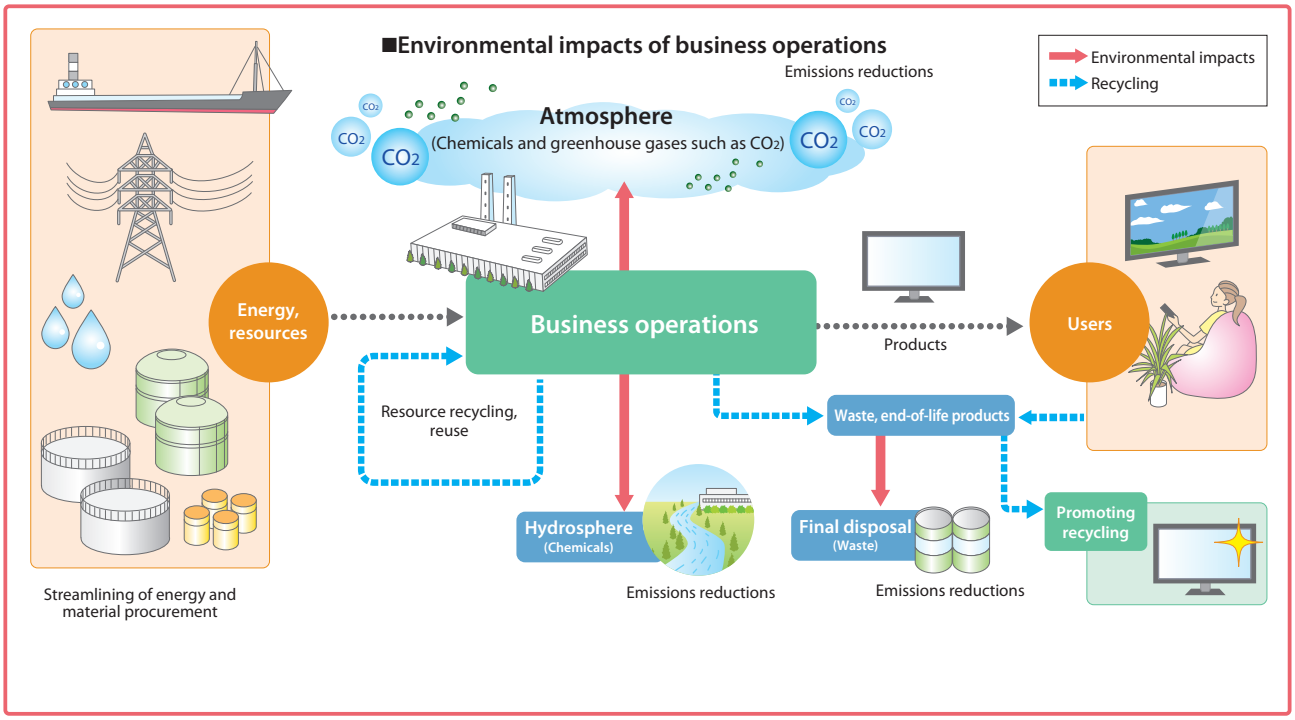



**Degree of improvement in business process eco-efficiency** = **Business process eco-efficiency in the fiscal year assessed** / **Business process eco-efficiency in the base year (FY2000)**

Business process eco-efficiency = Net sales / Environmental impacts of all business processes

(Environmental impact) GHGs, chemicals, and waste → Impact → 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.



# Mitigation of Climate Change

To mitigate climate change, Toshiba Group is developing various initiatives, including reducing total GHG emissions and curbing $CO_2$ emissions resulting from product logistics.

## Reducing total GHG emissions

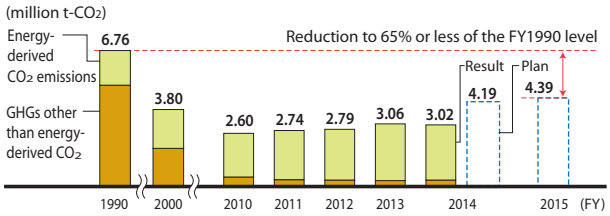
Toshiba Group proactively installed systems to collect and/or remove sulfur hexafluoride ($SF_6$), which is used to insulate heavy electric machinery, and perfluorocarbons (PFCs), which are used to produce semiconductors. As a result, in FY2000, the Group nearly halved the total amount of GHG emitted* compared to the FY1990 level, and in subsequent years, GHG emissions continued to decrease as the Group steadily took measures to improve its production processes. Meanwhile, energy-derived $CO_2$ emissions resulting from the use of electricity, etc., which peaked in FY2007, when production reached its highest level, have been reduced since FY2008 by taking energy-saving measures at all business and production sites, including ones overseas, restructuring production sites, and introducing renewable energy proactively.

* Six types of greenhouse gases targeted for reduction in the Kyoto Protocol: carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ($SF_6$)

### ●Results of FY2014 and future initiatives

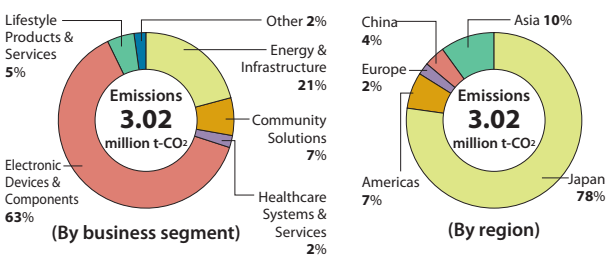
In FY2014, Toshiba Group reduced GHG emissions other than energy-derived $CO_2$ to less than 5% of the FY1990 level mainly by installing PFC removal equipment. Meanwhile, energy-derived $CO_2$ emissions were affected by deterioration in the $CO_2$ emission coefficient for electricity due to the effects of the Great East Japan Earthquake, but the Group reduced energy consumption compared to the FY2010 level by taking proactive conservation measures, including making capital investments. The $CO_2$ emission coefficient for electricity is expected to further deteriorate in the future, but Toshiba Group will continue to make steady efforts to reduce total GHG emissions by investing proactively in high-efficiency equipment. The Group's goal is to reduce total GHG emissions to 4.39 million tons or less (65% compared to the FY1990 level) in FY2015.

### ■Changes in total GHG emissions




* The $CO_2$ emissions coefficient for electricity is used to calculate energy-derived $CO_2$ emissions (in Japan, 3.50 t-$CO_2$/10,000 kWh in FY2010, 4.76 t-$CO_2$/10,000 kWh in FY2011, 4.87 t-$CO_2$/10,000 kWh in FY2012, and 5.70 t-$CO_2$/10,000 kWh in FY2013 and FY2014). Overseas electricity is based on the GHG Protocol.

### ■Breakdown of GHG emissions (FY2014)




## Reducing energy-derived $CO_2$ emissions

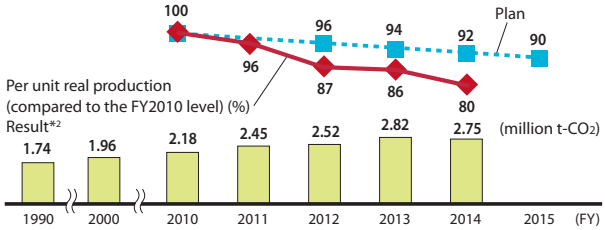
### ●Results of FY2014

Under the Fifth Environmental Action Plan, in order to assess $CO_2$ emissions measures consisting mainly of those for electricity conservation, the Group uses energy-derived $CO_2$ emissions per unit production by fixing the $CO_2$ emission coefficient to FY2010. The amount of $CO_2$ actually emitted in FY2014 was 2.75 million tons (an increase of 570,000 tons compared to the FY2010 level), a substantial increase which was greatly affected by the deterioration of the $CO_2$ emission coefficient for electricity due to the March 11, 2011 earthquake; however, as a result of initiatives to reduce power consumption mainly through energy-saving investments, proactive electricity conservation, and production adjustments, Toshiba Group was able to reduce energy-related $CO_2$ emissions per unit production to 80% of the FY2010 level, 12 percentage points higher than the initial goal.

### ●Future initiatives

In order to meet growing market demand, Toshiba Group plans to introduce facilities, mainly those for manufacturing semiconductors. Therefore, energy-derived $CO_2$ emissions are likely to increase in the near future. The Group will continue its efforts to reduce $CO_2$ emissions per unit production by 10% compared to the FY2010 level in FY2015 by adopting a variety of energy-saving measures, including performing energy-saving diagnoses and investing in energy-saving facilities.

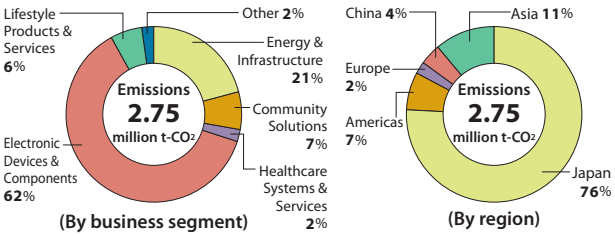
### ■Changes in energy-derived $CO_2$ emissions per unit production




* The $CO_2$ emissions coefficient for electricity is used to calculate energy-derived $CO_2$ emissions (in Japan, 3.50 t-$CO_2$/10,000 kWh in FY2010, 4.76 t-$CO_2$/10,000 kWh in FY2011, 4.87 t-$CO_2$/10,000 kWh in FY2012, and 5.70 t-$CO_2$/10,000 kWh in FY2013 and FY2014). Overseas electricity is based on the GHG Protocol.

*2 The coefficient of electricity for sites in Japan is fixed to that of FY2010.

### ■Breakdown of energy-derived $CO_2$ emissions (FY2014)




## Case Study 1 Initiative at the Service Information Center

**Toshiba Elevator and Building Systems Corporation**

The Service Information Center, which remotely monitors elevators and escalators, uses multiple server centers for Business Continuity Planning (BCP).

In the past, the center simultaneously operated two server centers. However, the new Service Information Center operates only a single server center on an ongoing basis; the other center is in stand-by mode. In an emergency, the Center will switch to the other server center, thereby reducing $CO_2$ emissions by 21 t-$CO_2$/year without changing BCP procedures.

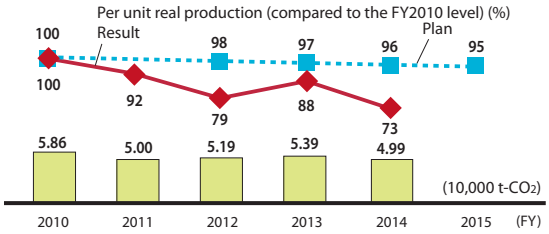
## Reducing $CO_2$ emissions associated with product logistics

**●Results of FY2014 and future initiatives**

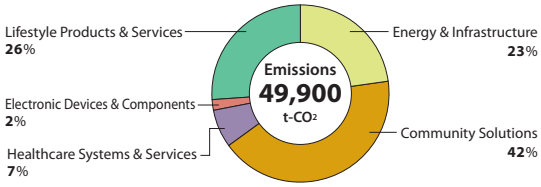
In FY2014, Toshiba Group strove to reduce energy consumption during product logistics by taking various measures, including improving load factors when transporting products, applying modal shifts to a wider range of products, and shortening the transport distance by restructuring distribution centers. As a result, we reduced total $CO_2$ emissions as well as $CO_2$ emissions per unit production compared to the previous year's level. In particular, the Group reduced $CO_2$ emissions per unit production by 27% compared to the FY2010 level, exceeding the initial target for FY2014 by 23%.

In the future, Toshiba Group will continue its efforts to reduce $CO_2$ emissions associated with product logistics with a view to reducing $CO_2$ emissions per unit production by 5% compared to the FY2010 level in FY2015.

### ■Changes in $CO_2$ emissions per unit production associated with product logistics in Japan




### ■Breakdown of $CO_2$ emissions associated with product logistics in Japan in FY2014




(By business segment)

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

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

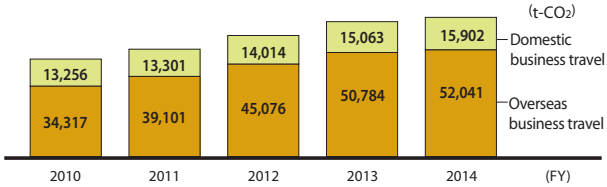
| | | |
|---|---|---|
| ●Total: 418,000 t-$CO_2$ | | |
| (Breakdown) | International logistics | : 347,000 t-$CO_2$ |
| | Logistics in overseas countries | : 22,000 t-$CO_2$ |
| | Logistics in Japan | : 50,000 t-$CO_2$ |

## Reductions in $CO_2$ emissions from employees' business travel

Toshiba Group is working to analyze $CO_2$ emissions resulting from employees' business travel. The graph below indicates $CO_2$ emissions from employees' business travel (by air) from FY2010 to FY2014.

In FY2014, $CO_2$ emissions increased due to a larger number of employees traveling on business trips mainly to launch new businesses.

### ■Changes in $CO_2$ emissions from employees' business travel




## Use of Renewable Energy

Toshiba Group is continuously striving to use renewable energy for a wider range of its operations. In FY2014, the Group used about 4,898 MWh's worth of renewable energy. This means that the Group reduced $CO_2$ emissions by about 2,792 tons*. Toshiba Corp. has also used a green power system since January 2005 and has since been purchasing 2,000 MWh of electricity under a green power certificate annually.

* Calculated based on 5.70 t-$CO_2$/10,000 kWh

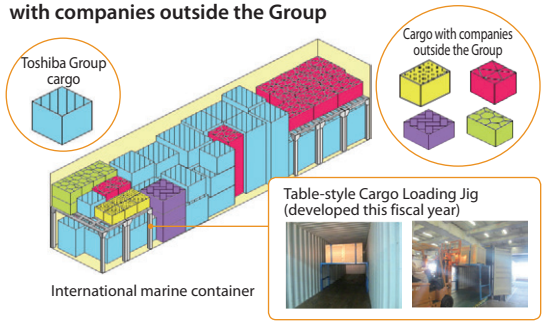
## Case Study 2 Promoting consolidated delivery by international marine containers

**Toshiba Logistics Corporation**

International transport using marine containers can greatly reduce GHG emissions compared to other transport modes such as air freight. However, international marine container transport consolidated with other companies' cargo in the past sometimes caused damage to Toshiba cargo or influenced its delivery schedule. Therefore, Toshiba Group took the lead in developing container plans as well as cargo loading jigs inside containers, thereby improving loading efficiency and realizing high-quality, low-cost consolidated delivery that allows for simpler packaging. In addition, by using RFID* tags that meet international standards, we were able to improve operational efficiency as well as to visualize inventory and transport information.

* RFID: Radio Frequency IDentifier

**Consolidated delivery of cargo with companies outside the Group**



# Effective Use of Resources

In order to realize a sustainable society based on a sound material cycle, Toshiba Group works to reduce the volume of raw materials and water resources used in its business operations as well as to use them effectively, striving to reduce the volume of generated waste and final disposal thereof.

## Reducing the total waste volume

Toshiba Group is working to reduce waste generation by minimizing the volume of waste generated per unit production, which indicates business process efficiency improvement, as well as by reducing the total volume of waste to a level below the Earth's environmental capacity.

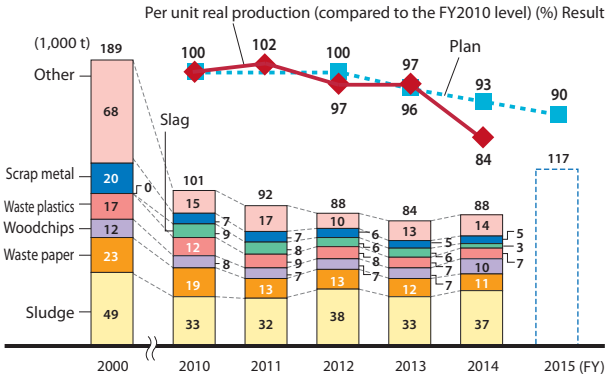
**●Results of FY2014**

In FY2014, the total volume of waste generated per unit production was 84% compared to that of FY2010, exceeding the initial target. The volume of waste (excluding that of objects with value) totaled 88,000 tons, which is 28,000 tons lower than the initial target.

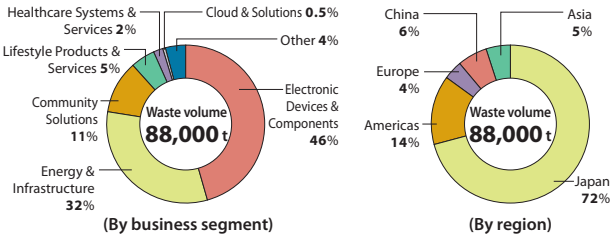
**●Future initiatives**

In the Fifth Environmental Action Plan, Toshiba Group aims to reduce the volume of waste per unit production in FY2015 by 10% compared to FY2010 and to reduce the total volume of waste to 117,000 tons. We will promote dialogues with stakeholders inside and outside the Group and create diverse networks for resource recycling.

### ■Waste volume and total volume of waste generated per unit production




### ■Breakdown of the total volume of waste generated (FY2014)




## Reducing the final disposal volume

In order to create a sound material-cycle, sustainable society, Toshiba Group is working to achieve zero waste emission—an initiative of reducing final landfills to zero by promoting the reuse and recycling of waste.

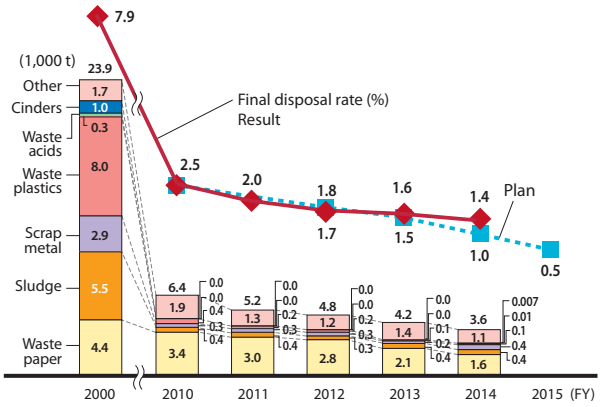
**●Results of FY2014**

The percentage of final landfills to the total volume of waste generated by Toshiba Group in FY2014 was 1.4%, falling short of the initial target of 1.0%, though an improvement of 0.2% compared to the previous year.

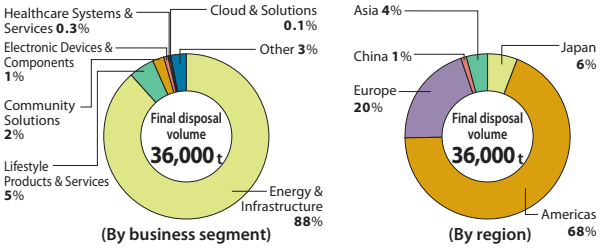
**●Future initiatives**

One goal of the Fifth Environmental Action Plan is to reduce the percentage of final landfills to 0.5% in FY2015. To this end, Toshiba Group will take recycling measures and accumulate recycling know-how at business and production sites in Japan as well as apply such know-how to overseas sites with high reduction potential.

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




### ■Breakdown of the final waste disposal volume (FY2014)




## Case Study 1 Initiative for reducing waste through use of ICT solutions

**Toshiba Solutions Corporation**

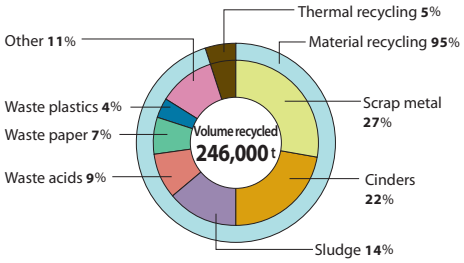
Toshiba Solutions Corporation implements ICT solutions for work style innovation on its own and greatly contributes to effective use of resources. Expanding the use of thin clients specially designed to provide the minimal necessary functions to users (such as data input and display on network-connected devices) while centrally managing applications and files on servers has helped to increase reuse of existing PCs and to reduce disposal of such PCs. The company also actively uses ICT infrastructure and equipment in meetings, thereby reducing the amount of paper documents printed and distributed. As a result of these initiatives, the company reduced the amount of waste by 30% in the five years up to and including FY2014.

Videoconference held via an ICT environment accessible anytime, anywhere

### ●Promoting recycling

In FY2014, Toshiba Group recycled 246,000 tons of resources. 95% of the total volume of waste generated was reused effectively as various resources. The recycled resources consisted mainly of scrap metal and cinders, and 95% of them were used effectively for material recycling (recycled into materials for products), and the remaining 5% for thermal recycling (heat recovery). In the future, Toshiba Group will continue to increase the total volume 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 volume recycled (FY2014)




## Efficient use of water resources

In response to a global increase in concerns regarding water problems, Toshiba Group is promoting sustainable water resource management. In FY2014, we enhanced analysis and management of production sites located in high-water-risk regions as well as sites that need large amounts of water. To analyze data on high-water-risk regions, we used Aqueduct, a water risk assessment tool developed by the World Resources Institute (WRI), and we considered water problems from various perspectives, including the risk of pollution by wastewater and level of interest in water issues among area residents, in addition to the physical amounts of water resources in individual river basins.

Each of our business and production sites has incorporated reducing the amount of water received into its annual plan in order to develop specific strategies and conduct follow-up surveys on an ongoing basis. Along with recycling wastewater generated in factories and introducing systems for using rainwater, we are promoting wide-ranging initiatives, including holding global events for water environment development with employees' participation.

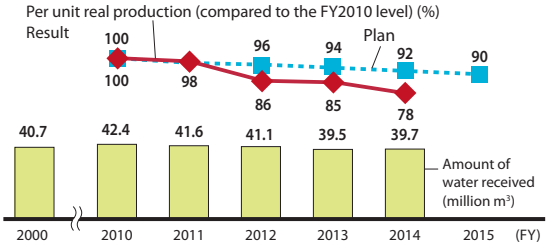
### ●Results of FY2014

The total amount of water received in FY2014 was 39.7 million $m^3$, an increase of approximately 160,000 $m^3$ compared to the previous fiscal year. However, the amount of water received per unit production was 78% of the total for FY2010, exceeding the initial target by 14 percentage points.

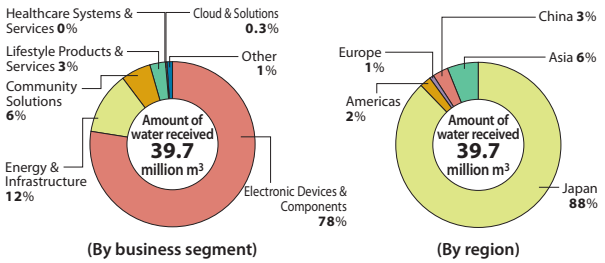
### ●Future initiatives

Under the Fifth Environmental Action Plan, Toshiba Group aims to reduce the amount of water received per unit production by 10% compared to the FY2010 level in FY2015. We will continue to promote the reuse and recycling of water in the electronic device segment, which accounts for 78% of the water received by Toshiba Group.

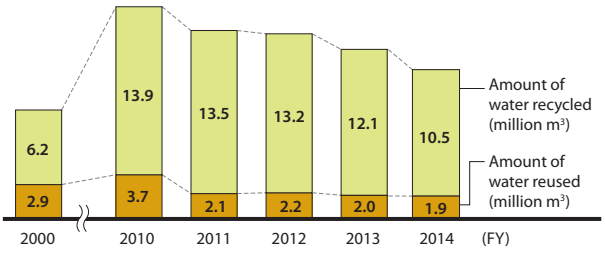
### ■Amount of water received and that per unit production




### ■Breakdown of the amount of water received (FY2014)




### ■Amount of water recycled (FY2014)




## Case Study 2 Initiative for water resource management at Oita Operations

**Oita Operations, Toshiba Corp.**

To meet its need for large amounts of water necessary to manufacture semiconductors, Oita Operations promotes comprehensive, strategic water resource management.

Reinforcing the transport tubes connecting multiple pure-water production systems has enabled efficient resource management, greatly reducing industrial water consumption. In addition, separately collecting relatively clean wastewater has increased the amount of water recycled. Wastewater treated and discharged into the river is monitored continuously based on independent standards stricter than legal requirements. In collaboration with the local community, Oita Operations is also developing activities for cleaning areas along the river and ecosystem conservation activities.

Wastewater treatment facility designed to discharge wastewater cleaner than the river water

River survey conducted along the Kitahana River to restore firefly habitats

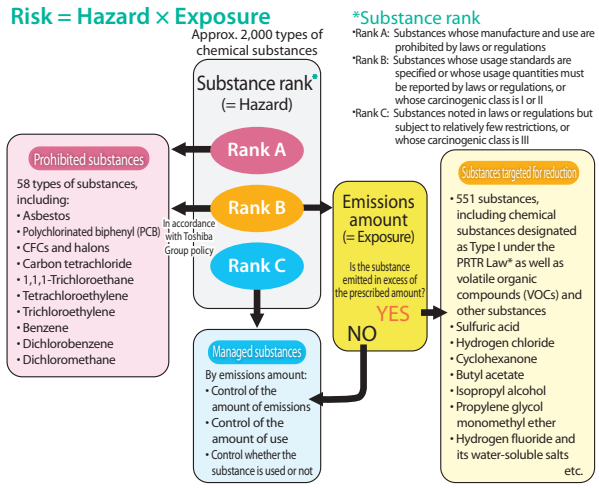
# Management of Chemicals

Toshiba Group is striving to manage chemical substances appropriately in its business operation processes. The Group reduces emissions of targeted substances by using alternatives, improving processes, and taking other measures.

## 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 ranking of the substance equivalent to hazard levels and emissions equivalent to exposure to the substance.

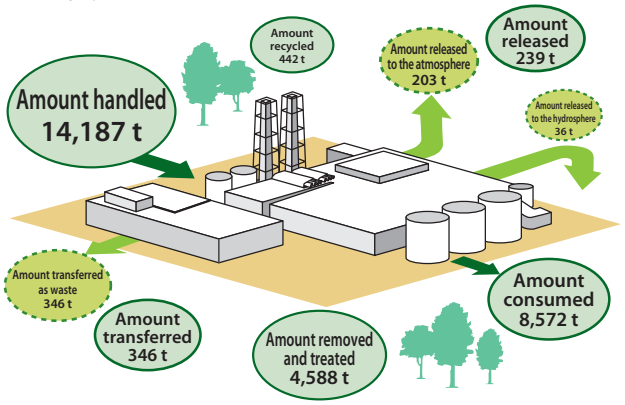
### ■Substance ranking and management classifications




* Law Concerning Pollutant Release and Transfer Register

### ■PRTR-based material balance

The balance of Toshiba Group's total material volume based on the PRTR Law.




- 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 sewerage 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 chemical substances

Toshiba Group strives to reduce the consumption of chemical substances by designating substances that have large direct impacts on the environment as those targeted for reduction. By business segment, electronic devices, power and social infrastructure systems, and community solutions account for over 90% of the total emissions of such substances, and by region, 70% of such emissions originate from Japan.

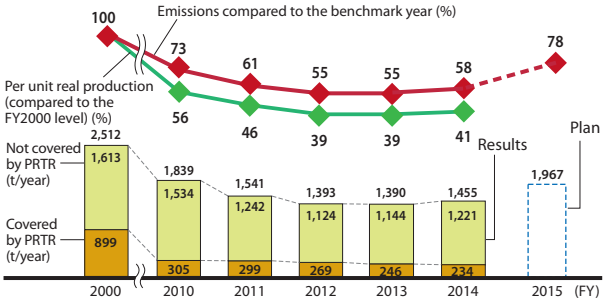
**●Results of FY2014**

In FY2014, Toshiba Group gave priority to taking measures for solvents used in cleaning and resin processing, which ranked high among such emissions, and promoted such initiatives as using alternative substances, starting operation of combustion detoxifying devices, improving manufacturing processes in order to reduce the use of raw materials, and reducing the amount of VOC evaporation by enhancing chemical management. As a result, the Group reduced emissions of substances targeted for reduction by 1,057 tons (42%) compared to the FY2000 level.

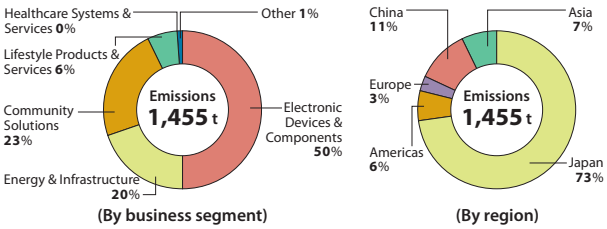
**●Future initiatives**

In the Fifth Environmental Action Plan, the Group aims to reduce the emissions of substances in FY2015 to 1,967 tons. It plans to use alternative substances and increase material efficiency by improving processes as an incoming countermeasure and expand introduction of emission removal and collection equipment as a outgoing countermeasure.

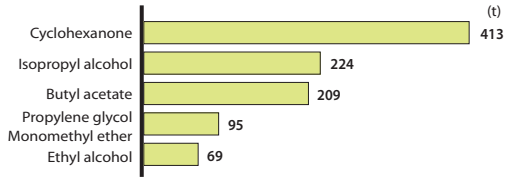
### ■Emissions of substances targeted for reduction




### ■Breakdown of emissions of substances targeted for reduction (FY2014)




### ■Emissions of top five substances targeted for reduction (FY2014)

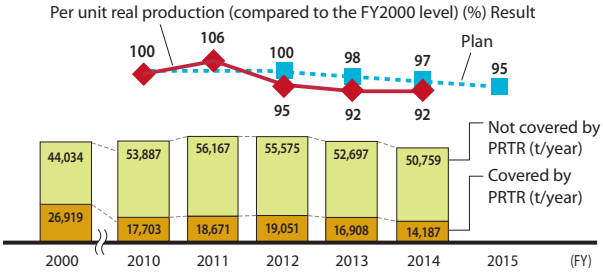


## Reduction in the amount of chemical substances handled

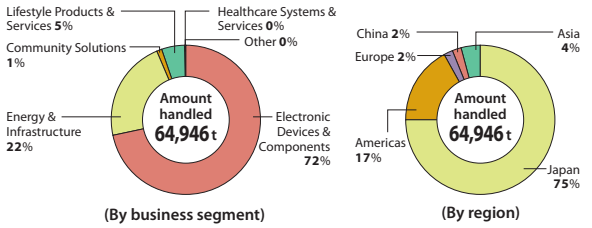
**●Results of FY2014 and future initiatives**

In FY2014, electronic devices as well as power and social infrastructure systems accounted for over 90% of the total amount of chemicals handled, with substances used for chemical reactions and wastewater treatment raking high among chemicals. The material balance for PRTR-covered chemicals indicates that 32% of them are removed through coagulation and absorption and 60% 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 1% of the chemicals used are discharged into the atmosphere or hydrosphere. Under the Fifth Environmental Action Plan, the Group is adding the amount of chemicals handled per unit production as a new target indicator, thereby aiming to reduce the amount by 5% compared to the FY2010 level in FY2015.

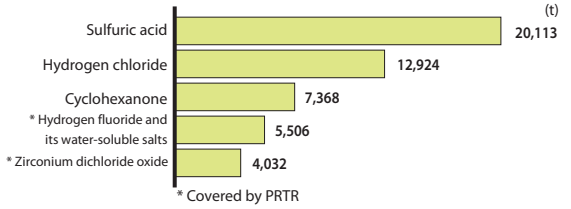
### ■Amounts of substances targeted for reduction handled




### ■Breakdown of the amounts of substances targeted for reduction handled (FY2014)



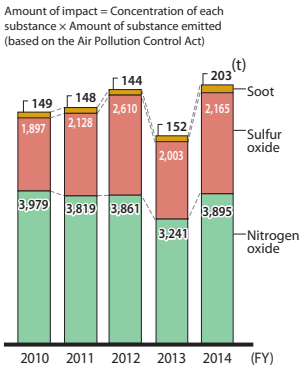

### ■Amounts of top five substances targeted for reduction handled (FY2014)



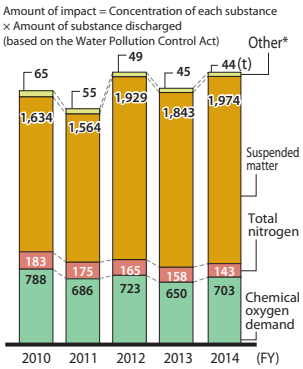

## Management of substances that have impacts on the atmosphere and hydrosphere

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 the level of chemical oxygen demand (COD), an indicator of water pollutants, and emissions of total nitrogen and suspended matter to ensure appropriate management of such emissions. In addition, each business and production site voluntarily sets the maximum permissible levels of concentrations for these substances and complies with these prescribed standards. Moreover, in recent years, the Group has been working to improve productivity in reducing environmental impacts. Besides harnessing existing processing facilities' reserve capabilities, the Group is also conducting pioneering efforts such as increasing performance depending on loads and using waste liquids to treat wastewater.

### ■Impacts on the atmosphere




### ■Impacts on the hydrosphere




* N-hexane extracts, phenols, copper, zinc, soluble iron, soluble manganese, total chromium, total phosphorus, and nickel

## Management of ozone-depleting substances

Toshiba Group possesses specified chlorofluorocarbons (CFCs), which deplete the ozone layer, as coolant for air conditioners installed in factories; we appropriately dispose of such CFCs in accordance with the law. In FY2013, the Group had 11.8 tons of specified CFCs. In FY2014, due to measures such as facility upgrades, we reduced the amount of specified CFCs to 11.0 tons, a 7% reduction compared to the previous year.

In FY2015 and beyond, we will further enhance CFC management through daily inspections, periodic inspections, and environmental audits in accordance with the Act for Rationalized Use and Proper Management of CFCs.

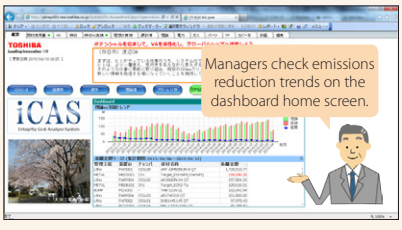
## Case Study 1 Improving efficiency in reducing the amount of gases and chemicals by visualization and abnormality detection

**Oita Operations, Toshiba Corp.**

Toshiba Corporation's Oita Operations has developed a tool (iCAS: Integrity Cost Analysis System) designed to clarify the optimal (theoretical) amounts of gases and chemicals required for processing in semiconductor manufacturing and to visualize and analyze disparities between the theoretical amounts and amounts actually used.

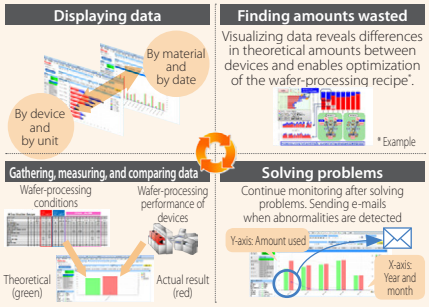
iCAS enables the differences between theoretical and actual amounts of gases and chemicals to be grasped, thereby helping reduce emissions.

**iCAS: integrity Cost Analyze System**




**Universal system accessible to a wide range of users, from managers to production line operators**

**Implementing an improvement cycle with iCAS**



# Responses 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 and production sites. The Group's basic policy is to prevent chemical substances from contaminating soil and groundwater as well as to identify environmental liabilities, such as PCB-containing equipment, and to systematically dispose of such equipment.

## 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 and production 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 and production sites confirmed contamination at 12 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.

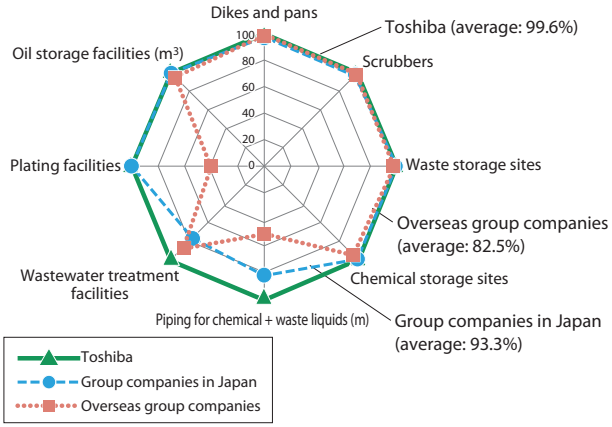
Toshiba Group uses the water pumping method to purify soil and groundwater mainly in areas with high concentrations of VOCs, but if the VOC concentration in such areas is lowered due to progress in purification, the Group takes such measures as stepping up water pumping efforts in other areas with relatively high VOC concentrations. In FY2014, the Group collected 500 kg of VOCs. The amount collected was about 15% less compared to the previous year, but this is chiefly because the amount of VOCs collected per liter of water pumped is gradually decreasing due to the progress made in purification through drastic measures that make the most of the opportunity presented by land modifications, methodological changes (from water pumping to in-situ purification), and declines in relative concentrations of VOCs as a result of 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.

## 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 FY2014, Toshiba Group achieved a compliance rate of 99.6% for all of Toshiba's sites and 93.3% 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 (FY2014)




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

| Business and production site | Location | Progress in purification | Purification method*1 | Amount collected*2 (kg) |
|---|---|---|---|---|
| Former site of Asia Electronics Inc.'s Yokohama Operation Center | Yokohama, Kanagawa Prefecture | Being monitored*3 | A, E, G | - |
| Komukai Complex, Toshiba Corp. | Kawasaki, Kanagawa Prefecture | Purification in progress | A, G | 76.2 |
| Himeji Operations (Semiconductor), Toshiba Corp. | Taishi Town, Ibo County, Hyogo Prefecture | Being monitored (North district) | D, F, G | - |
| | | Purification in progress (South district) | A | 159.3 |
| Oita Operations, Toshiba Corp. | Oita, Oita Prefecture | Purification in progress | A | 0.3 |
| Fuji Operation, Toshiba Carrier Corp. | Fuji, Shizuoka Prefecture | Purification in progress | A, B | 102.5 |
| Tsuyama Operation, Toshiba Carrier Corp. | Tsuyama, Okayama Prefecture | Purification in progress | A, B | 0.3 |
| Kawamata Seiki Co., Ltd. | Kawamata Town, Date County, Fukushima Prefecture | Purification in progress | A | 0.0 |
| Former site of Toshiba Shomei Precision Corp.'s Kawasaki Works | Kawasaki, Kanagawa Prefecture | Being monitored | A, E, F | - |
| Former site of Toshiba Lighting & Technology Corp.'s Iwase Works | Sakuragawa, Ibaraki Prefecture | Purification in progress | A | 0.0 |
| Ibaraki Plant, Lighting Device & Fixture Corp. | Joso, Ibaraki Prefecture | Being monitored | A, B | - |
| Kimitsu Operation Center, Toshiba Components Co., Ltd. | Kimitsu, Chiba Prefecture | Purification in progress | A, B | 167.5 |

*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 2014 to March 2015.
*3 Monitoring: ..... Monitoring to confirm how things develop after work that will allow measures to be taken or purification is completed.

In order to ensure effective prevention of groundwater contamination, an act revising part of the Water Pollution Control Act was promulgated on June 22, 2011 and came into force on June 1, 2012. To prevent groundwater from becoming contaminated with hazardous substances*, new provisions have been added that require those who install facilities where hazardous substances are used, stored, or otherwise handled to comply with structural, equipment, and usage standards to block hazardous substances from entering the ground and to record and maintain records of periodic inspection results.
As early as FY1990, Toshiba Group established the Structural Design Guidelines, an initiative that anticipated the purpose of these revisions to the Act, and has since been working to improve compliance with these guidelines by developing measures to prevent underground infiltration and by conducting periodic facility inspections to facilitate on-site improvements.
Through such measures, we aim to further reduce environmental risks.

*As stipulated in Article 2 of the Order for Enforcement of the Water Pollution Control Act, the 28 hazardous substances subject to regulation include cadmium, lead, and trichloroethylene (as of April 2013).

## Case Study 1 Soil purification at Saku Operations

**Saku Operations, Toshiba Corp.**

The result of a survey conducted on the Saku Operations premises based on the Soil Contamination Countermeasures Act revealed that some parts of the premises were contaminated beyond what the standards permit. Therefore, we have been working to purify the soil.
We removed buildings to implement measures to reduce contamination. We plan to remove soil on the premises that has been contaminated beyond what the standards permit.

Overview of the construction site

## 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 appropriately dispose of PCB waste. The revision of the Enforcement Ordinance in December 2012 moved back the deadline for disposal of PCB waste until March 2027. In March 2015, Toshiba Group reported environmental liabilities of approximately 7.1 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 and production 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 legislations 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 10.4 billion yen in environmental liabilities was reported as a loss that could reasonably be estimated in March 2015. 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.
Toshiba Group has registered some 7,400 transformers and condensers with Japan Environmental Storage & Safety Corporation (JESCO), which started to provide wide-area PCB treatment services in FY2005. In FY2014, 920 transformers were treated. Thanks to the courtesy of Kitakyushu City, transformers and condensers stored at factories in Tokyo can be treated at JESCO's Kitakyushu factory from FY2015. This will likely allow us to make considerable progress in treating PCB-containing equipment. Toshiba Group will continue to safely treat PCB and PCB-containing products as quickly as possible.

PCB-containing equipment being transported to JESCO

# Recycling of End-of-Life Products

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

## Recycling end-of-life products globally

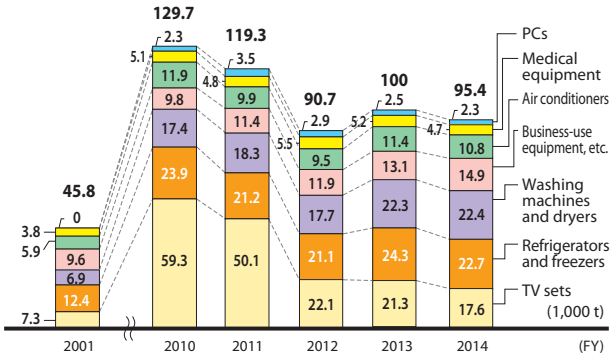
In order to ensure efficient use of resources and appropriate treatment of hazardous substances, in accordance with recycling regulations in each country and territory of the world, Toshiba Group is promoting the collection and recycling of products that customers have discontinued use of. The Group promotes collection and recycling of end-of-life products while striving to minimize collection and recycling costs as it complies with each country's recycling scheme. In Japan, in addition to products covered by the Act on the Recycling of Specified Kinds of Home Appliances, the Act on the Promotion of Effective Utilization of Resources, and other relevant laws, the Group has established a unique scheme to collect medical equipment, elevators, MFP/POS systems, and other industrial equipment. Toshiba Group also responds appropriately to the Directive on Waste Electric 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, India, and Australia and those expected to be enacted in the future by governments in Asia, Central and South America, and other regions.

**●Results of FY2014**

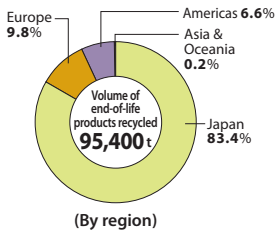
In FY2014, in Japan and abroad, Toshiba Group collected about 116,000 tons of end-of-life products, of which it recycled about 95,000 tons. In Japan, although the volume of the four types of home appliances collected decreased compared to the previous year, the volume of business-use equipment collected increased. Overseas, due to the TV business structural reform, the volume of TVs collected in Europe and the Americas decreased. As a result, the total volume of end-of-life products collected decreased by approximately 7,000 tons worldwide.

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 (FY2014)



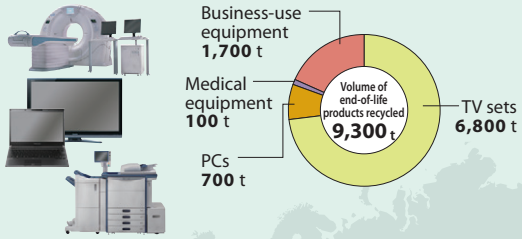
(By region)

Looking at the volume of end-of-life products recycled by region, in Japan 80% or more 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 include TV sets and business-use equipment. In the U.S., major items include TV sets and PCs. Maintaining the volume of end-of-life products collected in China and other Asian countries as well as preparing to respond to recycling-related laws that are expected to be enacted in other areas are issues to be addressed in the future.

### ■Volume of end-of-life products recycled by region (FY2014)

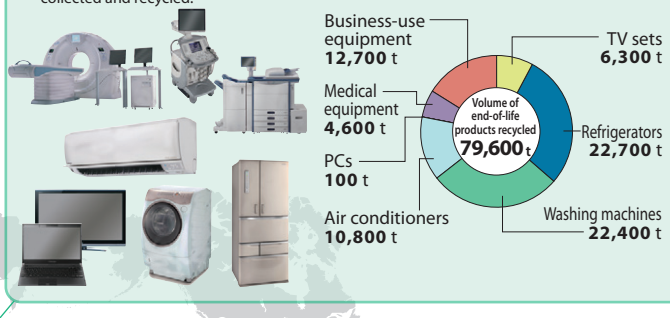
**● Europe: 9,300 t**

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



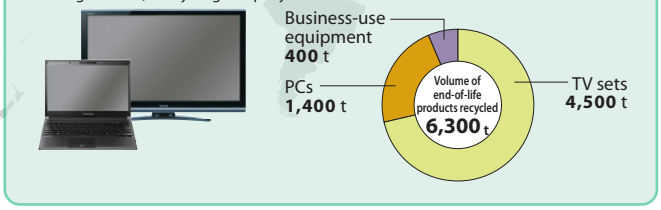

**● Japan: 79,600 t**

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



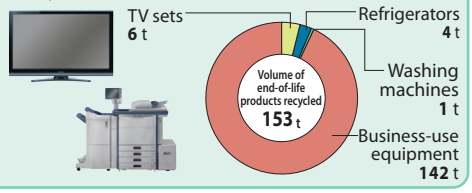

**● Americas: 6,300 t**

Toshiba Group is collecting and recycling end-of-life products such as TV sets and PCs through MRM[*2], a recycling company.




**● Asia and Oceania: 153 t**

In addition to recycling TV sets voluntarily, Toshiba Group voluntarily implements a PC recycling program in countries in Asia and Oceania, such as Singapore, Thailand, Indonesia, and Malaysia.




*1 The WEEE Directive is a directive of the European Union concerning waste electrical and electronic equipment.
*2 MRM: Electronic Manufacturers Recycling Management Company, LLC is a recycling management firm established jointly with Panasonic Corp. and Sharp Corp. in September 2007.

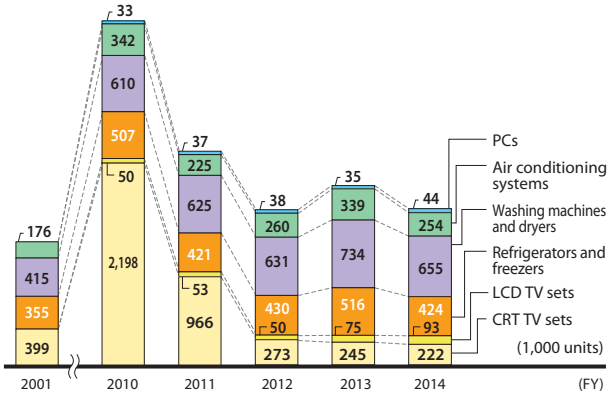
## Recycling of end-of-life products in Japan

In Japan, Toshiba Group is collecting and recycling end-of-life products in accordance with the Act on the Recycling of Specified Kinds of Home Appliances and the Act on the Promotion of Effective Utilization of Resources.

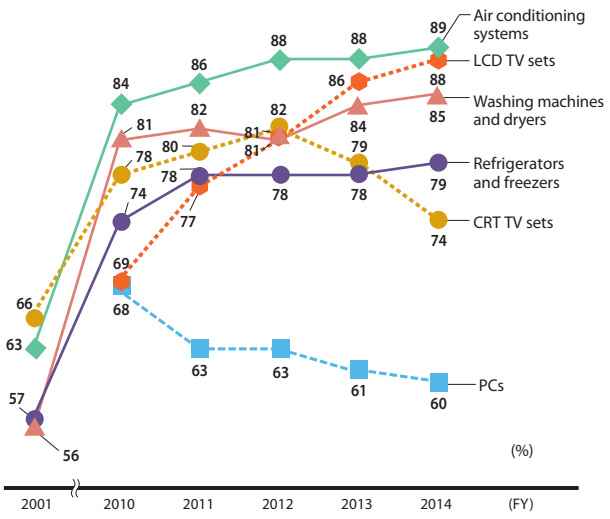
**●Results of FY2014**

The number of the four types of home appliances collected in FY2014 was approximately 1.65 million. The recycling rate for all four types of products decreased by about 14% compared to the previous year. This was chiefly because of a decrease in the number of appliances collected as a result of an end to the rush demand for replacement of old refrigerators, washing machines, and air conditioners caused by the consumption tax increase. However, the number of these appliances collected by Toshiba Group represented approximately 15% of the total of all such appliances collected in Japan, remaining at nearly the same level as FY2013. A total of 44,000 end-of-life PCs, a 26% increase compared to the previous year, were collected from businesses and homes for recycling. This was because many PCs were replaced due to the termination of support for Windows XP.

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




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




## Examples of recycling initiatives

In order to properly treat hazardous substances and effectively collect and recycle valuables, Toshiba Group is working to develop and apply recycling technology and promoting recycling in cooperation with local communities and governments.

### Case Study 1 Developing technology for recycling and reuse of photovoltaic panels

**Toshiba Environmental Solutions Corporation**

Toshiba Environmental Solutions Corporation is developing technology for recycling and reuse of photovoltaic panels, for which demand is likely to increase in the future. The company has built a specialized line for crushing photovoltaic panels; it can process roughly 40 t/month (approximately 3,500 250-W class panels). The company has also developed technology for collecting glass used in photovoltaic panel modules as sheet glass, thereby improving recycling performance. In the future, the company will create a process for realizing optimal treatment of photovoltaic panels, including reuse thereof, by introducing technology for analyzing and evaluating their power generation performance and soundness.

Panel-crushing and performance assessment equipment

### Case Study 2 Participating in a battery collection event in Vietnam

**Toshiba Lifestyle Products & Services Corporation**

Toshiba Lifestyle Products & Services Corporation participated in a battery collection event held in Vietnam in April 2015. In Vietnam, a law on recycling batteries and other electrical products is likely to come into force in 2016. This event was one program for raising citizens' awareness of this recycling law. Toshiba Lifestyle Products & Services conducted a campaign that enabled visitors to exchange 10 end-of-life batteries for 1 new battery at its booth; it collected some 13,000 batteries weighing approximately 250 kg. We will use the knowledge acquired through this event to ensure compliance with the law in the future.

Toshiba booth

Chapter 5 Green Management

# We aim to become the most excellent company globally by stepping up our environmental management.

INDEX

## Summary of activities in FY2014



## Toshiba Group's Policy for the Environment

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

## Toshiba Group's Basic Policy for the Environment

We of the Toshiba Group recognize that the basic responsibility of people living today is to hand over the precious global environment to the next generation in a sound condition. Out of this recognition and in accordance with our Environmental Vision, we will strive to create affluence and ensure coexistence with the earth. We will also contribute to realizing a sustainable society by aiming at achieving a low-carbon and recycle-oriented society that strives to coexist with nature through our environmental activities.

◆**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 mitigation of climate change, efficient use of resources, and management of chemicals.

◆**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.

## Initiatives for Green Management

Green Management is an initiative aiming at continuously improving the foundation of environmental management, such as the development of personnel responsible for environmental activities, environmental management systems, and environmental communication as well as conservation of biodiversity. Toshiba Group not only gives top priority to complying with laws and regulations but also provides environmental training to all employees. The Group will further acquire ISO 14001 certification for new overseas business and production sites, and based on our unique environmental audit system, we also strive to promote environmental management, develop environmentally conscious products, check environmental activities at our business and production sites, and raise the level of our environmental activities. Regarding environmental communication, we communicate information on the environmental aspects of our production activities as well as our products and services in addition to promoting initiatives that encourage collaboration with stakeholders, social contribution programs, and so forth in various countries and territories of the world in order to think about environmental issues together. To conserve biodiversity, we are working to optimize the locations of business and production sites as well as procurement of resources in business operations in accordance with the biodiversity guidelines and to minimize the effects of hazardous substances discharged into the environment. At the same time, we are advancing initiatives that contribute to the conservation of biodiversity through social contribution programs developed in cooperation with local governments and nonprofit organizations.

### ●Initiatives in FY2014

The Fifth Environmental Action Plan sets three goals for environmental activities, one of which is conservation of biodiversity. Toshiba Group is striving to globally develop ecosystem networks in which our business and production sites play a central role in collaboration with local communities, thus promoting biodiversity conservation that makes the most of each site's characteristics. In FY2014, we chose indicators for all 66 sites and started measuring effects at 44 locations. Another goal is environmental education and human resources development; we are developing Toshiba eco-style leaders, who play a leading role in each site's environmental activities. We will step up environmental activities at each site by globally registering 2,000 employees as Toshiba eco-style leaders by FY2015. In FY2014, 800 employees were registered in Japan and abroad. The third goal is environmental communication. Toshiba Group is expanding environmental communication to connect people around the world by encouraging all of our approximately 200,000 employees to carry out environmental activities that tie-in closely to local communities throughout the world. In FY2014, we conducted some 150 environmental programs at 110 sites in 20 countries globally.

### ■Initiatives for Green Management

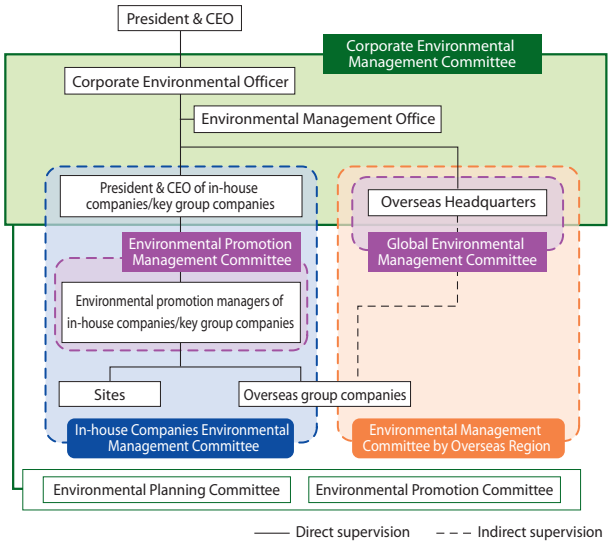
# Environmental Management Structure

## 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. The Corporate Environmental Management Office develops and implements corporate-level, important policy, strategy, and measures with the approval of senior managers and makes them fully known to all personnel of the company. Specifically, Toshiba semiannually convenes the Corporate Environmental Management Committee, a group-wide decision-making organization regarding environmental management chaired by the Corporate Environmental Officer, which consists of executive officers, environment management officers of in-house and key group companies, and overseas environmental promotion managers of corporate regional headquarters. Meetings of the Committee make proposals for environmental measures related to management, technological development, production, and sales, confirm and follow up on the progress in the Environmental Action Plan to achieve the Environmental Vision, discuss and decide the overall policy and plans for environmental management, and make the company-wide policy fully known to all managers and employees.

### ■Toshiba Group environmental management structure




The following committees are organized as subgroups of the Corporate Environmental Management Committee: the Environmental Planning Committee, which covers environmental management audits, biodiversity conservation programs, and environmental communication; and the Environmental Promotion Committee, which promotes efforts to develop environmentally conscious products and technologies as well as to reduce the impacts of business activities on the environment. 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.


Corporate Environmental Management Committee

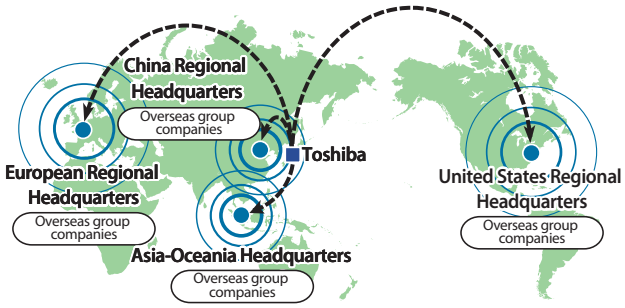
**●Enhancement of the global environmental management structure**

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.

Furthermore, Toshiba Group holds meetings of the Global Environmental Management Committee to promote the Group's environmental management in countries around the world.

We also have an auditing system through which we provide training for local auditors who conduct the environmental audits of overseas sites.

### ■Global environmental management network

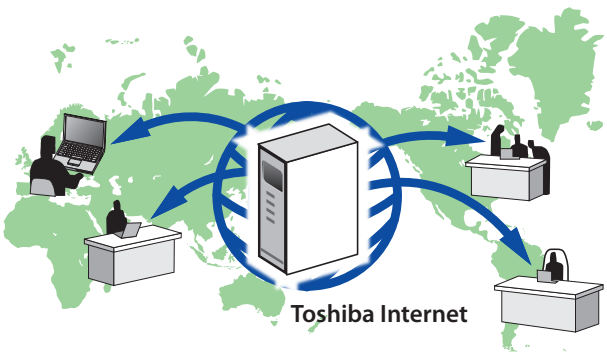



## Environmental Management Information System

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 (584 companies in FY2014) and is accessible from countries around the world.

### ■Global support system



# Environmental Education and Human Resource Development

## Training of eco-style leaders

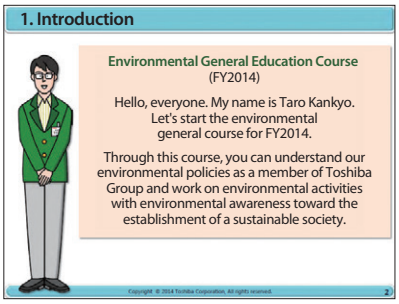
Toshiba Group is promoting the training of Toshiba eco-style leaders as part of "environmental education and human resource development" one of the new goals set forth in the Fifth Environmental Action Plan. The objective is to certify employees having keen environmental awareness in all divisions as Toshiba eco-style leaders and raise employees' overall environmental awareness through participation in internal environmental programs and events. To become certified, employees must obtain an internal or external environmental license (e.g., passing of the Eco Test sponsored by the Tokyo Chamber of Commerce and Industry or becoming a Toshiba environmental auditor or nature observation instructor). In FY2014, Toshiba Group certified 800 employees as eco-style leaders as initially planned. Certified eco-style leaders actively showed leadership in internal events, such as the Global Environmental Action.

## Environmental Education / Human Resources Development

In order to raise the level of environmental activities, we provide environmental education programs for all employees. These education programs are composed of (1) general education courses, (2) ISO 14001 education courses, and (3) specialized 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.

### ■Environmental education system

| General education | ISO 14001 education | Specialized education |
|---|---|---|
| e-learning (for all group company members) | Training courses for internal auditors | Education for certification of in-house environmental auditors (Site auditors/Technology auditors) |
| Education for new employees | Education for special employees | Introductory course on environmentally conscious design |
| Education for managers | General education | Toshiba Environmental School |




E-learning textbooks for FY2014

We provide training for auditors for our in-house environmental audits, 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 FY2014, 16 employees were certified as site auditors, 13 as technology auditors, and 17 as overseas local auditors. The current number of certified auditors is 389.

### ■Training for auditors (site audit)

Education and written examination (1 day)
↓
Chosen as a candidate
↓
Practical training
↓
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 a position equivalent to or higher than section chief
- ●Auditors are classified into chief auditors, executive auditors, and assistant auditors depending on their experience and skills.

**●Other**
- ●Education sessions are held once a year.
- ●The pass rate in FY2014 was about 59%.

**Toshiba Group certified auditors in FY2014**

Site auditors: 172 Overseas local auditors: 88
Technology auditors: 129

In FY2014, in order to improve our human resources in the area of environmental management, Toshiba Group is launching Toshiba Environmental School, a program to develop the environmental management abilities of young and mid-level employees in charge of environmental affairs.

### ■Toshiba Environmental School (Japan)

**Development of the next generation of environmental leaders**

(1) Developing environmental personnel by focusing on young people and raising the bar for such personnel
(2) Raising employee morale
(3) Strengthening employee unity through personnel exchanges within the Group
(4) Encouraging employees to realize new efforts by using external instructors effectively

**Realizing the significance of contributing to society and business through environmental affairs**

**Annual activity schedule**
- School entrance ceremony (start of the year)
- Formulating improvement measures* on a team-by-team basis
- Confirming courses of action at interim reporting sessions
- Making reports to the Corporate Environmental Officer (end of the fiscal year)

* Proposed improvement measures will be reflected in Toshiba Group's environmental management in subsequent years.

In FY2014, 11 employees from the environment, facility management, production planning, design and development, sales, and other departments participated on a committee to discuss the following three themes for approximately one year: environmental communication, effective use of resources, and environmental management for the future. At the final briefing in March, all participants presented the discussion results and proposals for future environmental management measures for each theme to a Corporate Environmental Officer.

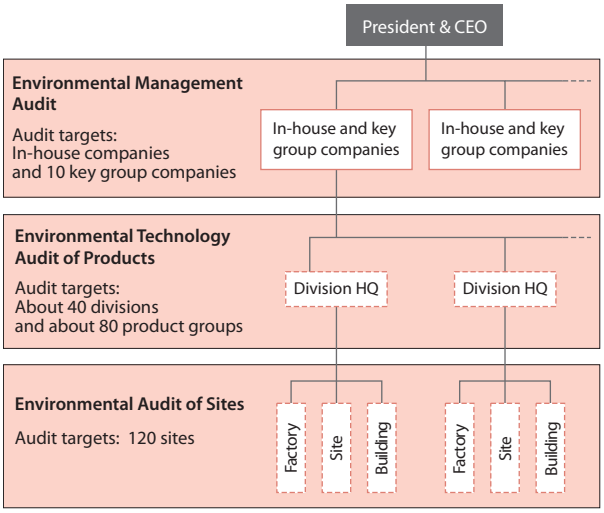
# Environmental Audits

## 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 the voluntary plan), 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 was 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 in-house companies and key group companies.

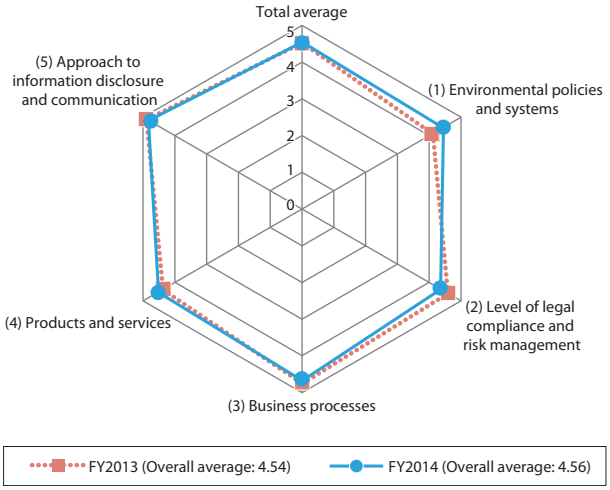
### ■Toshiba Group's environmental audit system




Since FY2006, these multiple audits have been systematized so that they could be conducted in three types of audits: (1) environmental management audits covering in-house companies and ten key group companies: (2) environmental technology audits of products covering about 40 divisions, and (3) environmental audits of sites covering 120 business and production sites, including non-manufacturing sites and non-consolidated subsidiaries. In-house companies and group companies conduct self-audits (self-inspections) within their companies based on the same standards in order to check business and production 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 improve evaluation level. Since FY2012, we have evaluated the level of environmental management based on audit items linked to the goals of the Fifth Environmental Action Plan, thus stepping up environmental management with the aim of becoming one of the world's foremost eco-companies.

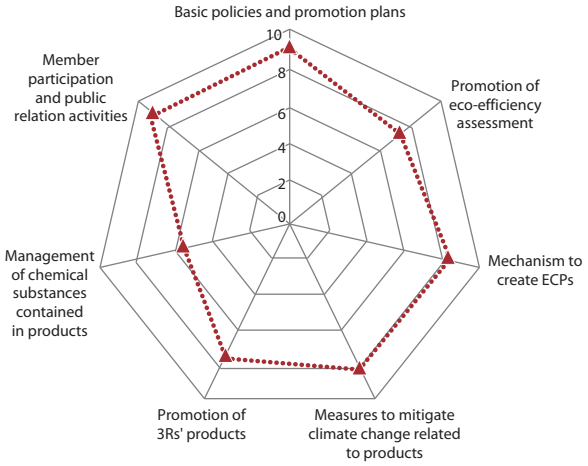
### ■Audit results (FY2014)

#### ●Environmental management audit (total number of check items: 72)

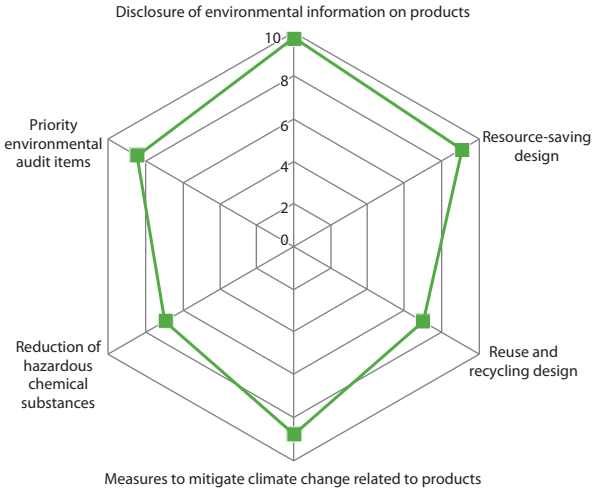



#### ●Environmental technology audit of products (total number of check items: 40)

**EMS audit***



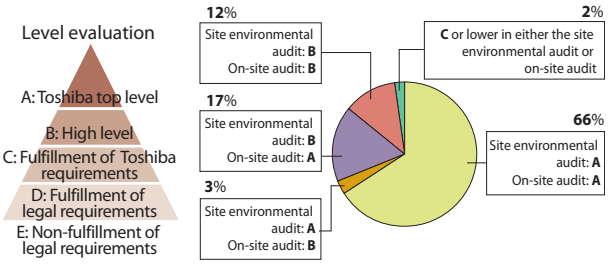

**Product/Technology audit**




* Environmental Management System

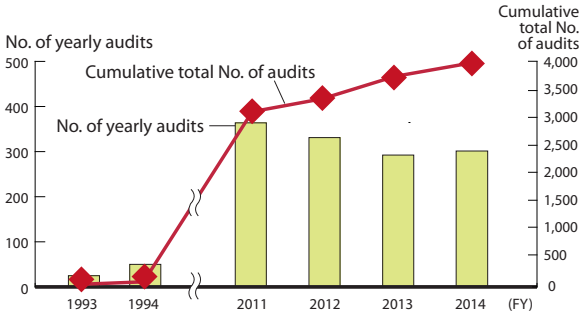
# Risks and Compliance

### ●Environmental audit of sites (total number of check items: 220)




We conduct over 300 audits, including self-audits, annually, and the total number of audits conducted since FY1993 exceeds 4,000. We also provide in-house training for auditors who conduct audits.

### ●Toshiba Group's environmental audit records




# ISO14001

## ISO 14001

In recognition of the importance of activities at business and production sites in promoting environmental management, we obtained ISO 14001 certification for all of Toshiba Corp.'s 14 domestic business and production sites by 1997 and have maintained the certification to this day. In addition, all of Toshiba Group's 175 business and production sites eligible for certification have obtained ISO 14001 certification. We will also acquire ISO 14001 certification for new overseas business and production 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 in-house and group companies.

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

As of May 30, 2015

| | Eligible sites | Certified sites | Certification rate |
|---|---|---|---|
| Toshiba Corporation's business and production sites | 14 | 14 | 100% |
| Domestic manufacturing sites | 54 | 54 | |
| Domestic non-manufacturing sites | 40 | 40 | |
| Overseas manufacturing sites | 48 | 48 | |
| Overseas non-manufacturing sites | 19 | 19 | |
| Total | 175 | 175 | |

### ●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 and production sites comply with environmental rules. We conduct in-house environmental audits 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 and production sites, new regulation policies, and examples of accidents in other companies from among group companies.

Unfortunately, there were three cases of violations of laws and environmental accidents in FY2014, but we responded swiftly and appropriately to the problems. Using the lesson learned from this problem, we will strive to prevent the recurrence of similar problems and make further efforts to ensure compliance with relevant laws and ordinances in the future.

**■Toshiba Corp. Keihin Product Operations (June 2014)**
Oil flowed out from a rainwater outlet into the ocean.

**■Shenzhen Shenzhi Precision Parts Co., Ltd. (China) (August 2014)**
Subjected to penalties for inadequate reporting of the test operation of an automatic cleaning machine.

**■Toshiba Hydro Power (Hangzhou) Co., Ltd. (China) (March 2015)**
Received an order to suspend painting operations and penalties due to deficiencies in an exhaust ventilation system.

Measures were implemented to identify the causes and to prevent recurrences in all these cases.

### ●Responses 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 in-house companies, key group companies and business and production sites work in collaboration under the direction of the Corporate Environmental Officer to implement appropriate measures, including sharing information, checking relevant business and production sites and preventing recurrences.

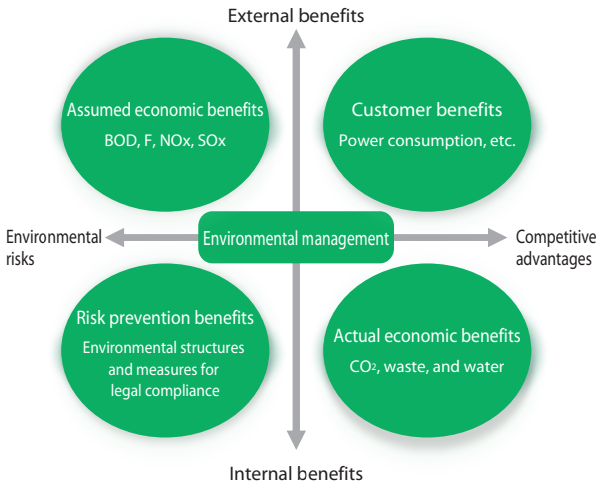
# Environmental Accounting

## 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.

Environmental costs are calculated in accordance with the Ministry of the Environment's Environmental Accounting Guidelines 2005. As for environmental benefits, Toshiba Group's environmental accounting assumes four basic concepts: competitive advantages, prevention of potential environmental risks, 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, actual economic benefits resulting from reductions in the amount of waste and energy consumed, assumed economic benefits estimated to result from reductions in air pollutant emissions, benefits resulting from preventing potential risks. To assess benefits, we show reductions in environmental impact in physical amounts and also calculate benefits on a monetary basis.

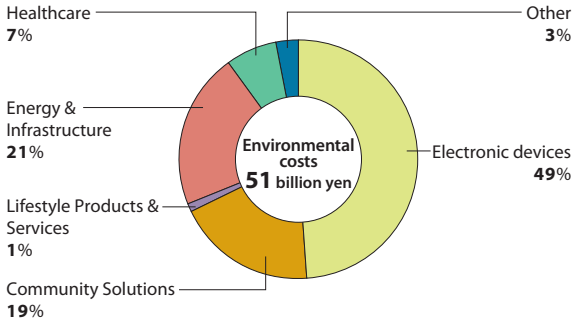
### ■Environmental accounting as a tool for environmental management




## Environmental costs and benefits

Total environmental costs increased by 5.6% from the previous year to 51 billion yen. Of the different business sections, the electronic device section, which handles semiconductors, accounted for the largest percentage of total environmental costs, followed by the Energy & Infrastructure Group and the Community Solutions Group. Total investments increased by 3.3% from the previous year to 9.3 billion yen.

### ■Breakdown of environmental costs by business segment (FY2014)

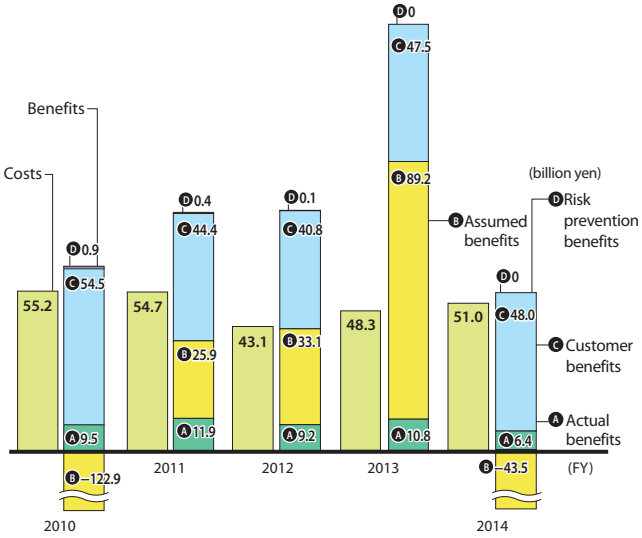



The total amount of environmental benefits was 10.9 billion yen, a 92% decrease compared to the previous year. The largest reason behind this decrease was increased environmental impacts resulting from the expansion of Sigma Power Ariake Co., Ltd.'s thermal power generation business, which caused assumed economic benefits to become negative. Compared to other business segments, thermal power generation has an excessively large environmental impact, which caused the decrease in environmental benefits. The amount of assumed economic benefits excluding the effects of the power generation business was 2.8 billion yen. The amount of actual economic benefits was 6.4 billion yen, a 41% decrease compared to the previous year. These results were due to the fact that reductions in environmental impact were smaller in FY2014 compared to the previous year because of an increase in emissions resulting from expansion of production.

Meanwhile, customer benefits increased by 1% to 48 billion yen. This was due largely to expanded sales of products that can greatly reduce power consumption, such as air conditioners and other energy-saving home appliances as well as LED lighting.

We will continue to appropriately analyze environmental costs and develop environmental management measures to further increase environmental benefits.

### ■Environmental costs and benefits



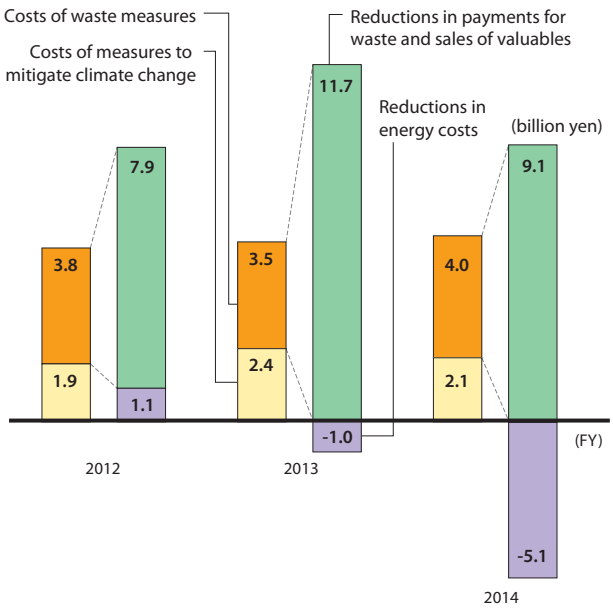
## Cost benefits of environmental management measures

The figure 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 below, costs are expressed as business area costs and benefits as actual benefits.

In FY2014, reductions in energy costs were much smaller compared to the previous year. This was due to increased expenses for electricity and fuel as a result of increased semiconductor production. On the other hand, measures to dispose of waste brought larger benefits than the costs incurred taking them.

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




### ■Environmental costs (FY2014)

Unit: million yen

| Category | Description | Investment | Costs |
|---|---|---|---|
| Business area costs | Reduction in environmental impact | 7,644 | 19,730 |
| Upstream/downstream costs | Green procurement, recycling, etc. | 660 | 971 |
| Administration costs | Environmental education, EMS maintenance, tree planting on factory grounds, etc. | 238 | 4,062 |
| R&D costs | Development of environmentally conscious products, etc. | 738 | 25,833 |
| Public relations costs | Support for local environmental activities, donations, etc. | 14 | 76 |
| Environmental damage restoration costs | Restoration of polluted soil, etc. | 0 | 296 |
| **Total** | | **9,294** | **50,968** |

### ■Environmental benefits (FY2014)

| Category | Description | Reductions in environmental impact | | Benefits measured as a monetary value (million yen) | Calculation method |
|---|---|---|---|---|---|
| (A) Actual benefits | Costs that can be measured directly as a monetary value, such as electricity and water charges | Energy | -1,809,058 (GJ) | -5,091 | Reductions in electricity charges and waste processing costs compared to the previous year, plus sales of valuables |
| | | Waste | 9,276 (t) | 9,131 | |
| | | Water | 293 (1,000 m³) | 2,352 | |
| | | Total benefits measured as a monetary value | | 6,392 | |
| (B) Assumed benefits | Reductions in environmental impacts measured as a monetary value | Reduction in the amount of chemicals discharged | -836 (t) | -43,528 | To obtain monetary values, we assessed the impact of different substances by using the equivalent amount of cadmium for each substance, which we calculated based on environmental standards and on threshold limit values for chemical substances specified by the American Conference of Governmental Industrial Hygienists (ACGIH-TLV), and then multiplying such amounts by the damage compensation for cadmium contamination. In order to compare different environmental impacts by the same standard, reductions in environmental impacts on the atmosphere, hydrosphere, and soil compared to the previous year are shown alongside monetary amounts that represent the values of such reductions. |
| (C) Customer benefits | Reductions in environmental impacts during product use measured as a monetary value | Reductions of $CO_2$ emissions during use | 3.53 (million t-$CO_2$) | 47,995 | Reductions in environmental impact throughout product life cycles measured in physical and monetary units (monetary amounts) The product life cycle includes (1) material procurement, (2) manufacture, (3) transport, (4) use, (5) collection and transport, (6) recycling, and (7) proper treatment. In this report, we focused on reductions in environmental impacts during product use. We used the following equation to calculate energy-saving benefits:<br>Benefits (yen) = Σ [(Old model annual power consumption – New model annual power consumption) × Number of units sold annually × Standard unit electricity price] |
| (D) Risk prevention benefits | Reductions in environmental risks before investment | | | 29 | Benefits from investments in environmental structures, such as dikes designed to prevent soil and groundwater contamination, evaluated for their effects of hedging against possible future risks We used the following equation to calculate risk avoidance effects per capital investment project: Standard purification and repair costs and the occurrence factor were calculated using values originally estimated by Toshiba to evaluate risks involved in chemical leaks.<br>Risk avoidance effects = Amount of chemicals, etc. stored or retained × Standard purification/repair costs × Occurrence factor |
| **Total monetary benefits** | | | | **10,888** | |

Reductions in environmental impact for actual and assumed benefits indicate differences between FY2013 and FY2014.
Reductions in environmental impact for customer benefits are based on comparisons between the benchmark year (in principle FY2000) and FY2014.
Negative benefits indicate that the increase in environmental impacts exceeded reductions due to increases in production and other factors.

# Environmental Communication

## Toshiba Group Global Environmental Action

The Fifth Environmental Action Plan aims to expand environmental communication to connect people around the world. In FY2013, we launched the Toshiba Group Global Environmental Action initiative. We designated June 5, World Environment Day, as the day for Toshiba Group Global Environmental Action, and all Toshiba Group employees in various parts of the world take environmental actions together around this day in order to raise employees' environmental awareness and foster a sense of togetherness.

We establish linkage between environmental activities at different sites around the world and share a sense of togetherness by passing a baton (TOSHIBA BATON), which symbolizes our campaign. Going forward, we will promote not only activities among employees but also programs for collaborating with government institutions and NPOs.

Toshiba Group
A Day of Global Environmental Action

## <Connecting site activities> Local environmental action at business and production sites worldwide

In FY2013, the first year for Toshiba Global Environmental Action, we implemented a simultaneous light-down campaign globally on June 5, World Environment Day. We turned off lights at our business and production sites in 10 countries. In 2014, we expanded the scale of this action and carried out some 150 environmental activities over approximately two months (starting from April 1) at 110 sites in 20 countries.

In 2015, the third year of the Global Action, we implemented approximately 400 activities (from April 1 until June 5) at 276 sites in 25 countries. These activities (tree planting, cleaning, recycling, biodiversity conservation, etc.) were carried out under themes related to crucial local environmental issues (such as water, resources, energy, and chemical substances) chosen from among the issues addressed by T-COMPASS, our concept of environmental management. Many of the activities were supported not only by employees but also local government organizations, local community residents, and NPOs. At the 24th Toshiba Group Environmental Exhibition, held on June 11 and 12 at Toshiba Smart Community Center in Kawasaki, Japan, we presented an activity report to summarize our global action activities.


Toshiba China Co., Ltd. (China)

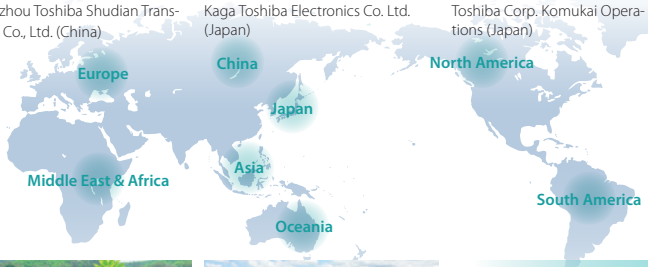

Changzhou Toshiba Shudian Transformer Co., Ltd. (China)


Kaga Toshiba Electronics Co. Ltd. (Japan)


Toshiba Corp. Komukai Operations (Japan)


Toshiba America Business Solutions, Inc. (U.S.A.)


Springfields Fuels Ltd. (United Kingdom)





Toshiba of Canada, Ltd. (Canada)


Toshiba of Europe Ltd. / Toshiba International (Europe) Ltd. (United Kingdom)


Toshiba Semiconductor (Thailand) Co., Ltd. (Thailand)


Toshiba Asia Pacific Pte., Ltd. (Singapore)

**During Toshiba Global Environmental Action 2015, we implemented some 400 environmental activities in 25 countries around the world!**

●Informational website
http://www.toshiba.co.jp/env/en/global_env_action/index.htm

## <Connecting individual activities> Employee-supported website TOSHIBA BATON

We presented photos of individual employees' activities on TOSHIBA BATON, an employee-supported website, to share information. We received more than 500 comments that indicated increased environmental awareness, such as "I made a habit of turning off unnecessary lights" and "The program helped raise my family's environmental awareness."

TOSHIBA BATON http://toshibaton.com/

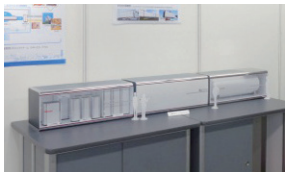
Sharing photos and comments on individual activities

TOSHIBA BATON, the symbol of Toshiba Global Environmental Action

## 24th Toshiba Group Environmental Exhibition

Each year, we hold the Toshiba Group Environmental Exhibition to publicly display Toshiba Group's latest environmentally conscious products and activities for reducing environmental impacts. In FY2015, we held the exhibition at Toshiba Smart Community Center in Kawasaki, Japan, on June 11 and 12. A total of 3,740 customers visited the exhibition during the two days.

In order to introduce visitors to the wide range of environmental initiatives developed by Toshiba Group, during the exhibition days, experts inside and outside Toshiba Group gave various lectures, and we conducted tours of technologies used in the Toshiba Smart Community Center.



Stand-alone Hydrogen Energy Supply System, a joint project with Kawasaki City

New automatic ticket gate, which attracted visitors' attention

## Eco-Products 2014


Toshiba Group exhibited its products at Eco-Products 2014, one of the largest environmental exhibitions in Japan, which was held at Tokyo Big Sight for three days from December 11 to 13, 2014. Under the concept of "eco-wisdom connecting all people with TOSHIBA BATON," we displayed products and technologies in a wide range of areas, from home appliances to social infrastructure.

At our exhibition booth, we introduced products and technologies necessary for mitigation measures to reduce greenhouse gas emissions and for adaptation measures to alleviate the impact of climate change. We also held a variety of environmental courses for elementary and junior high school students as well as business seminars for general visitors.

Photovoltaic experiment in which participants competed to generate power by pedaling bicycles

Vantage Elan™, an MRI system that received the Eco-products Award

Eco-style tour, a tour of the Toshiba booth for children


Environmental course where visitors learn about LED lighting

### ●Publication of a book on Toshiba Group's environmental management


*The Challenge of Toshiba, the World's Foremost Eco-company: Enhancing Management through Environmental Strategies*, a book describing Toshiba Group's environmental management in detail, was published by Nikkan Kogyo Shimbun in May 2015. The book traces the history of Toshiba Group's environmental management, from its incubation to its expansion, introducing readers to a wide range of issues, from current strategies to future prospects, including cutting-edge low-carbon and energy-saving technologies; reductions in environmental impacts at manufacturing sites; biodiversity conservation on factory premises; and 3R activities.

## Environmental advertisements and campaigns

### ●Human Smart Community advertisement campaign


Toshiba aims to create value from events associated with objects by focusing on three main business areas (energy, storage, and healthcare) in order to realize a secure, safe, and comfortable society. We advertise our products alongside the global message, "Human Smart Community by Lifenology – the technology life requires" through advertisements, exhibitions, and events.

### ●Hydrogen energy technology advertisement

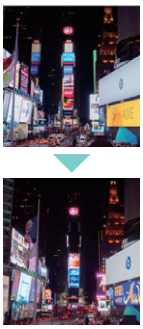

Toshiba Group made a TV commercial to advertise the potential of hydrogen, a next-generation energy source that is attracting public attention, along with hydrogen solutions that employ Toshiba's hydrogen energy technologies. We are also introducing $H_2$One™, a stand-alone hydrogen energy supply system, to increase expectations for a hydrogen society.

Website on hydrogen technologies: http://www.toshiba.co.jp/newenergy/en/index.htm

### ●Joint project by Nikkei Business Publications "ecomom" and Toshiba Corp. Eco-products 2014 collaboration site


In preparation for the Eco-products 2014 exhibition held from December 11 to 13, 2014,we launched a website to introduce the Toshiba booth in collaboration with Nikkei Business Publications, Inc. We presented messages on eco-wisdom and the commitments of developers who created Excellent ECPs in order to convey Toshiba Group's environmental policies.

### ●Participating in the Earth Hour 2015 event organized by the World Wide Fund for Nature (WWF)



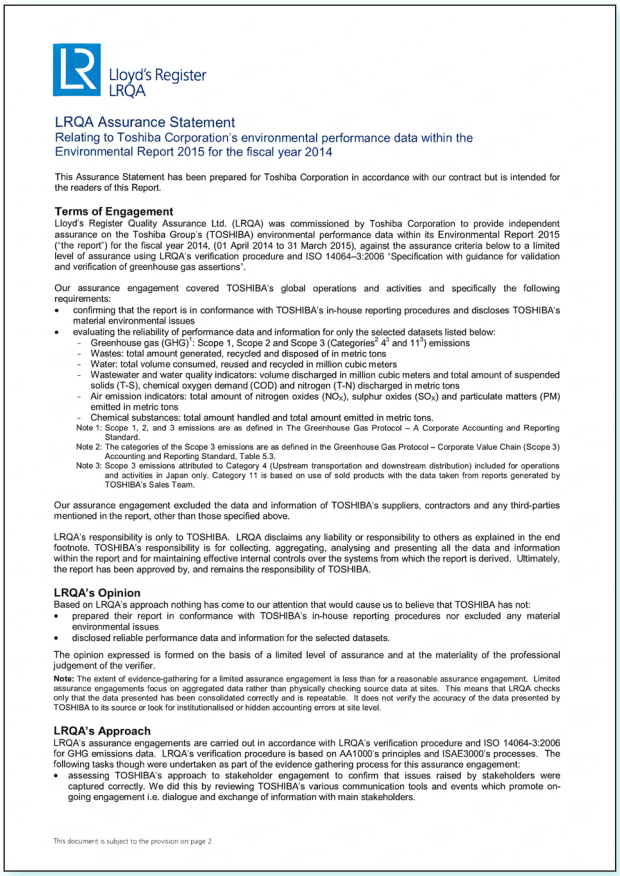
Toshiba Group participated in the Earth Hour event in which all lights are turned off worldwide at the same hour on the same day. In addition to advertising billboards in major cities, including Sendai, Osaka, New York, Paris, London, Shanghai, Hong Kong, Chongqing, Bangkok, Hanoi, Ho Chi Minh, Dubai, and Delhi, we took the initiative in turning off the lights at 35 sites around the globe to cooperate in the energy-saving activities.

Informational website: http://www.toshiba.co.jp/env/en/news/150406.htm

# Third-Party Evaluation

In order to improve the reliability of the environmental performance data presented in this report, Toshiba Group requested Lloyd's Register Quality Assurance Ltd.* to conduct a third-party verification of the data.
Global data regarding the results for FY2014 was reviewed to check the processes of the collection, aggregation, and internal verification of data and the accuracy of aggregated data.

* LRQA is a certification body approved by over 50 accreditation agencies in areas such as quality, the environment, energy, occupational safety, food safety, medical devices, automobiles, aeronautics, and railways.



Lloyd's Register LRQA

**LRQA Assurance Statement**
Relating to Toshiba Corporation's environmental performance data within the Environmental Report 2015 for the fiscal year 2014

This Assurance Statement has been prepared for Toshiba Corporation in accordance with our contract but is intended for the readers of this Report.

**Terms of Engagement**
Lloyd's Register Quality Assurance Ltd. (LRQA) was commissioned by Toshiba Corporation to provide independent assurance on the Toshiba Group's (TOSHIBA) environmental performance data within its Environmental Report 2015 ("the report") for the fiscal year 2014, (01 April 2014 to 31 March 2015), against the assurance criteria below to a limited level of assurance using LRQA's verification procedure and ISO 14064–3:2006 "Specification with guidance for validation and verification of greenhouse gas assertions".

Our assurance engagement covered TOSHIBA's global operations and activities and specifically the following requirements:
- confirming that the report is in conformance with TOSHIBA's in-house reporting procedures and discloses TOSHIBA's material environmental issues
- evaluating the reliability of performance data and information for only the selected datasets listed below:
  - Greenhouse gas (GHG)[1]: Scope 1, Scope 2 and Scope 3 (Categories[2] 4[3] and 11[3]) emissions
  - Wastes: total amount generated, recycled and disposed of in metric tons
  - Water: total volume consumed, reused and recycled in million cubic meters
  - Wastewater and water quality indicators: volume discharged in million cubic meters and total amount of suspended solids (T-S), chemical oxygen demand (COD) and nitrogen (T-N) discharged in metric tons
  - Air emission indicators: total amount of nitrogen oxides ($NO_X$), sulphur oxides ($SO_X$) and particulate matters (PM) emitted in metric tons
  - Chemical substances: total amount handled and total amount emitted in metric tons.

Note 1: Scope 1, 2, and 3 emissions are as defined in The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard.
Note 2: The categories of the Scope 3 emissions are as defined in the Greenhouse Gas Protocol – Corporate Value Chain (Scope 3) Accounting and Reporting Standard, Table 5.3.
Note 3: Scope 3 emissions attributed to Category 4 (Upstream transportation and downstream distribution) included for operations and activities in Japan only. Category 11 is based on use of sold products with the data taken from reports generated by TOSHIBA's Sales Team.

Our assurance engagement excluded the data and information of TOSHIBA's suppliers, contractors and any third-parties mentioned in the report, other than those specified above.

LRQA's responsibility is only to TOSHIBA. LRQA disclaims any liability or responsibility to others as explained in the end footnote. TOSHIBA's responsibility is for collecting, aggregating, analysing and presenting all the data and information within the report and for maintaining effective internal controls over the systems from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of TOSHIBA.

**LRQA's Opinion**
Based on LRQA's approach nothing has come to our attention that would cause us to believe that TOSHIBA has not:
- prepared their report in conformance with TOSHIBA's in-house reporting procedures nor excluded any material environmental issues
- disclosed reliable performance data and information for the selected datasets.

The opinion expressed is formed on the basis of a limited level of assurance and at the materiality of the professional judgement of the verifier.

**Note:** The extent of evidence-gathering for a limited assurance engagement is less than for a reasonable assurance engagement. Limited assurance engagements focus on aggregated data rather than physically checking source data at sites. This means that LRQA checks only that the data presented has been consolidated correctly and is repeatable. It does not verify the accuracy of the data presented by TOSHIBA to its source or look for institutionalised or hidden accounting errors at site level.

**LRQA's Approach**
LRQA's assurance engagements are carried out in accordance with LRQA's verification procedure and ISO 14064-3:2006 for GHG emissions data. LRQA's verification procedure is based on AA1000's principles and ISAE3000's processes. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:
- assessing TOSHIBA's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this by reviewing TOSHIBA's various communication tools and events which promote on-going engagement i.e. dialogue and exchange of information with main stakeholders.

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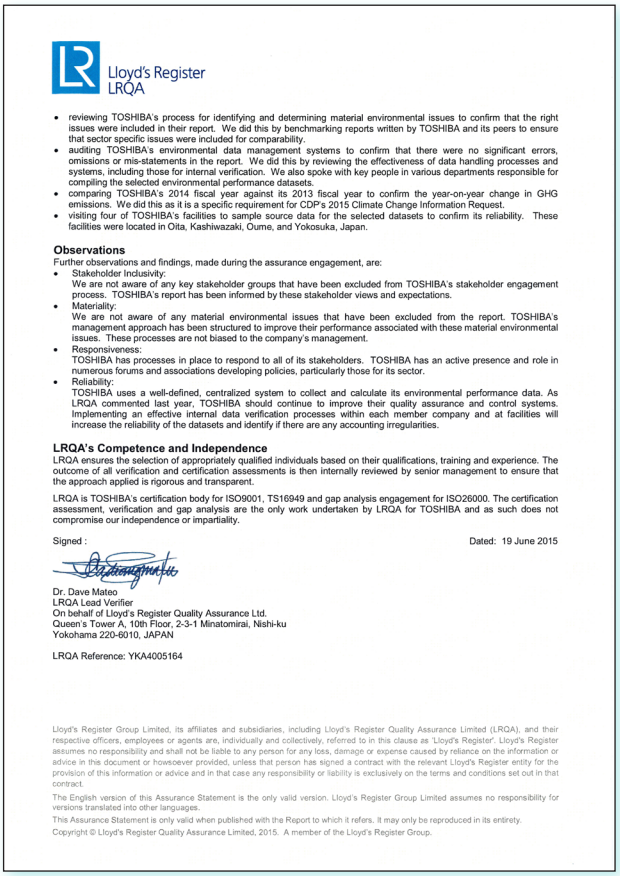

Lloyd's Register LRQA

- reviewing TOSHIBA's process for identifying and determining material environmental issues to confirm that the right issues were included in their report. We did this by benchmarking reports written by TOSHIBA and its peers to ensure that sector specific issues were included for comparability.
- auditing TOSHIBA's environmental data management systems to confirm that there were no significant errors, omissions or mis-statements in the report. We did this by reviewing the effectiveness of data handling processes and systems, including those for internal verification. We also spoke with key people in various departments responsible for compiling the selected environmental performance datasets.
- comparing TOSHIBA's 2014 fiscal year against its 2013 fiscal year to confirm the year-on-year change in GHG emissions. We did this as it is a specific requirement for CDP's 2015 Climate Change Information Request.
- visiting four of TOSHIBA's facilities to sample source data for the selected datasets to confirm its reliability. These facilities were located in Oita, Kashiwazaki, Oume, and Yokosuka, Japan.

**Observations**
Further observations and findings, made during the assurance engagement, are:
- Stakeholder Inclusivity:
  We are not aware of any key stakeholder groups that have been excluded from TOSHIBA's stakeholder engagement process. TOSHIBA's report has been informed by these stakeholder views and expectations.
- Materiality:
  We are not aware of any material environmental issues that have been excluded from the report. TOSHIBA's management approach has been structured to improve their performance associated with these material environmental issues. These processes are not biased to the company's management.
- Responsiveness:
  TOSHIBA has processes in place to respond to all of its stakeholders. TOSHIBA has an active presence and role in numerous forums and associations developing policies, particularly those for its sector.
- Reliability:
  TOSHIBA uses a well-defined, centralized system to collect and calculate its environmental performance data. As LRQA commented last year, TOSHIBA should continue to improve their quality assurance and control systems. Implementing an effective internal data verification processes within each member company and at facilities will increase the reliability of the datasets and identify if there are any accounting irregularities.

**LRQA's Competence and Independence**
LRQA ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

LRQA is TOSHIBA's certification body for ISO9001, TS16949 and gap analysis engagement for ISO26000. The certification assessment, verification and gap analysis are the only work undertaken by LRQA for TOSHIBA and as such does not compromise our independence or impartiality.

Signed : Dated: 19 June 2015

Dr. Dave Mateo
LRQA Lead Verifier
On behalf of Lloyd's Register Quality Assurance Ltd.
Queen's Tower A, 10th Floor, 2-3-1 Minatomirai, Nishi-ku
Yokohama 220-6010, JAPAN

LRQA Reference: YKA4005164

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## Reference View

Toshiba has established and implemented a highly reliable data collection and reporting system for environmental performance data. However, as LRQA mentioned in its 2014 warranty statement, the company must further improve its internal controls. It is recommended to continuously consider effective measures to prevent site level data entry, improve traceability, and strengthening internal data verification in order to achieve the higher credibility of the disclosed data.

# Evaluation by External Parties (FY2014 results)

■Evaluation of products

| Award title | | Award-winning item(s) | Winner |
|---|---|---|---|
| 11th Eco-Products Awards | Chairman's Award (Eco Product Category) | Superconducting magnet whole-body MRI system Vantage Elan™ | Toshiba Medical Systems Corporation |
| | Chairman's Award (Eco Service Category) | Environmentally conscious lighting system for cultural properties | Toshiba Lighting & Technology Corporation |
| FY2014 Minister of the Environment's Award for Activities to Mitigate Global Warming | (Technology Development and Commercialization Category) | Development and commercialization of a POS system that employs a vertical scanner for image processing | Toshiba TEC Corporation |
| 2014 Grand Prize for Excellence in Energy Efficiency and Conservation | Product and Business Model Category Chairman of the Energy Conservation Center Japan's Prize | EcoCute for home use ESTIA Premium Model | Toshiba Carrier Corporation |
| | | LED lighting equipped with Toshiba's Only-One technology | Toshiba Lighting & Technology Corporation |
| City of Kawasaki's Low $CO_2$ Kawasaki Brand 2014 | Certification in the Product and Technology Category | Phased array weather radar | Toshiba Corp. Komukai Operations |
| | | Bullet train automatic ticket gate EG-7000 | |
| Kawasaki Mechanism Certification System | | Solid-state multiparameter (MP) weather radar | Toshiba Corp. Komukai Operations |
| | | Bullet train automatic ticket gate EG-7000 | |
| FY2014 Awards for Engineers Who Have Made Distinguished Contributions in the Electric Industry | Encouragement Award | Development of an inverter electric balancer | Nishishiba Electric Co., Ltd. |
| | | Improvement in the efficiency of high-frequency induction furnaces | Kitashiba Electric Co., Ltd. |
| 18th Energy Winner Award in Korea | Energy Saving Award (Green Product Category) | Air-cooled heat pump chiller Universal Smart X | Toshiba Carrier Corporation |
| Imaging Society of Japan | Technology Award | Loops paper reuse system | Toshiba TEC Corporation |
| Mathematical Systems Science and Its Applications | 2013 Outstanding Paper Award | Development of an Energy-saving Function for Elevator-group Control by Dynamically Controlling the Number of Moving Elevators | Toshiba Corp. Corporate Research & Development Center<br>Yoshiyuki Sakamaki and Hisashi Yamada<br>Toshiba Research Consulting Corporation<br>Toshiaki Tanaka<br>Toshiba Elevator and Building Systems Corporation<br>Toshio Sugihara |

■Evaluation of business activities

| Award title | | Award-winning item(s) | Winner |
|---|---|---|---|
| FY2014 Awards for Resource-Recycling Technologies and Systems | The METI Minister Award | Collection and recycling of artificial fluorite from waste hydrofluoric acid | Toshiba Corporation, Asahi Glass Co., Ltd., and Organo Corporation |
| FY2014 Minister of the Environment's Award for Activities to Mitigate Global Warming | Activity Implementation and Promotion Category | Activities to mitigate climate change through effective energy-saving measures and contributions to local communities | Toshiba Corp. Fuchu Operations |
| FY2014 Awarding of Reduce, Reuse, Recycle Promotion Manager | 3Rs' Promotion Council Chairman's Award | Initiative for effective use of resources in the manufacture of NAND flash memories | Toshiba Corp. Yokkaichi Operations |
| 11th LCA Society of Japan Award | Honorable Award | Life-cycle evaluation and utilization of wrapping and packaging materials for electrical and electronic products | Toshiba Logistics Corporation and Toshiba Corporation |
| FY2014 Fuchu City Environmental Conservation Contribution Awards | Testimonial of contribution to environmental conservation | Initiatives for promoting environmental conservation in Fuchu City | Toshiba Corp. Fuchu Operations |
| FY2014 Fukushima Protocol (business and production site version): Past Experience | Award (Office and Store Category) | Contribution to the mitigation of climate change through $CO_2$ emissions reduction campaigns at business and production sites | Toshiba Alpine Automotive Technology Corp. |
| FY2014 Akita Prefecture Environmental Grand Prize | Grand Prize in the Environmental Beautification Category | Planting hydrangeas on roads in and around the industrial complex | Toshiba Social Automation Systems Co., Ltd.'s Akita Operations |
| Iwate Prefecture Eco Action Awards | Award | Contribution to mitigation of climate change through environmental programs, including energy-saving and 3R activities | Iwate Toshiba Electronics Co., Ltd. |
| Niigata Prefecture Commendation for Production Sites with Outstanding Recycling Performance | | Zero emissions activities | Toshiba Home Technology Corporation |
| FY2014 Kanagawa Earth Environment Awards | Award (Earth Environment Conservation Activity Category) | Environmental conservation activities | Toshiba Corp. Yokohama Complex |
| | | | Toshiba Lighting & Technology Corporation |
| Isogo Ward Green Curtain Panel Exhibition | Isogo Ward Chief's Award (Production Site Category) | Creation of green curtains | Toshiba Corp. Yokohama Complex |
| Third Mie Environmental Grand Prize | Award (Environmental Management Category) | Development of products having the industry's highest level of major environmental performance, energy-saving in manufacturing processes, environmental CSR activities rooted in local communities, etc. | Toshiba Corp. Mie Operations |
| Commendation for Advanced Companies in the Hangzhou Economic and Technological Development Zone | Certification as a clean manufacturing company | Environmentally conscious manufacturing processes | Hangzhou Toshiba Home Technology Electronics Co., Ltd. |
| | Certification as a company that manages power balance | Energy-saving manufacturing processes | Hangzhou Toshiba Home Technology Electronics Co., Ltd. |
| Shenyang City Environmentally Conscious Company | Hongbang | Environmental management | Toshiba Elevator (Shenyang) Co., Ltd. |
| Shenyang City Environmentally Counscious Evaluation | Green company | Environmental management | Toshiba Elevator (Shenyang) Co., Ltd. |
| Guangdong Province Clean Manufacturing Company | | Energy-saving activities, waste reduction, and other clean production activities | Toshiba HA Manufacturing (Nanhai) Co., Ltd. |
| Singapore 3R Packaging Awards | Gold Award | Reduction in use of wooden pallets | Toshiba TEC Singapore Pte. Ltd. |
| Green Industry Certification | Level 3 (Green System) | Systematic environmental management | Toshiba Hokuto Electronic Devices (Thailand) Co., Ltd. |
| CII Southern Region Environment, Health and Safety Award 2014 | 3 Star Rating | Environmental work safety and health activities | Toshiba Carrier (Thailand) Co., Ltd. |
| Best Safety Professional Award | Best Environmental Health & Safety Professional | Environmental work safety and health activities | Toshiba JSW Power Systems Private Ltd. |
| Annual CATIE Awards | Greening of the Supply Chain Award; First Place | Guidance for suppliers on $CO_2$ emissions reductions | Toshiba of Canada, Ltd. |

■Evaluation of communication programs

| Award title | | Award-winning item(s) | Winner |
|---|---|---|---|
| Third Kawasaki City Smart Life Style Awards | Grand Prize | Global Environmental Action | Toshiba Corporation |
| | Encouragement Award | Environmentally conscious initiatives and enlightenment activities for six neighborhood associations near the site | Toshiba Corp. Komukai Operations |
| 18th Environmental Communication Awards | Environmental Report Category Evaluation Committee Special Award | Environmental Report 2014, CSR Report 2014, Annual Report 2014 (Operational Review), Annual Report 2014 (Financial Review) | Toshiba Corporation |
| | Excellence Award (Environmental TV Commercial Category) | Ten Years of LED and You | Toshiba Corporation |
| FY2014 Kansai Eco-Office Grand Prize | | Initiatives for reviewing rules for sorted collection of plastics and environmental communication | Toshiba Corp. Himeji Operations-Semiconductor |
| Awards for Ongoing Corporate Citizenship Activities for Local Communities | Ongoing Contribution Award | Holding environmental reporting meetings with local communities for 10 years running | Iwate Toshiba Electronics Co., Ltd. |
| Environmental Conservation Pioneering Company | | Large-scale environmental conservation activities in collaboration with local government organizations and local residents | Toshiba HA Manufacturing (Nanhai) Co., Ltd. |
| Environmental Protection Bureau Director-General's Award in the Hangzhou Economic and Technological Development Zone | | Making postcards that promote water environment conservation and donating them to schools in the company's vicinity | Toshiba Information Equipment (Hangzhou) Co., Ltd. |

■Evaluation related to biodiversity

| Award title | | Award-winning item(s) | Winner |
|---|---|---|---|
| 2014 Biodiversity Action Awards Japan | Committee's Award | Biodiversity conservation activities and contributions to mainstreaming at 64 business and production sites worldwide | Toshiba Group |
| | Award | Breeding of golden venus chubs and expansion of their protected habitat | Toshiba Corp. Himeji Operations-Semiconductor |
| FY2014 Kawasaki City Award for Environmental Contribution | | Initiatives for maintaining areas planted with trees and for biodiversity conservation | Toshiba Corp. Hamakawasaki Operations |
| Mother Nature Awards | Best Company Award | Biodiversity conservation activities | Toshiba Information Equipment (Philippines), Inc. |

■Evaluation by the mass media and SRI

| Award title | Award-winning item(s) | Winner |
|---|---|---|
| 18th Nikkei Environmental Management Level Survey | Second place in the manufacturing industry | Toshiba Corporation |
| | Fourth place in reputation rankings | |
| CDP | Disclosure score: 100 points; performance band: A rating | Toshiba Corporation |

**Committed to People, Committed to the Future.**

**TOSHIBA CORPORATION**
**1-1, Shibaura 1-chome, Minato-ku, Tokyo, 105-8001, Japan**

## Contacts:

Corporate Environment Management Office
**Tel: +81-3-3457-2403 Fax: +81-3-5444-9206**

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

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

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Please give us your opinions or comments on
the report for future reference.

**URL https://www.webcom.toshiba.co.jp/csr/env.php**

Published in February 2016