

# Protecting the Global Environment

Fujitsu will contribute to the resolution of global environmental challenges through ICT, while at the same time reducing the Fujitsu Group's own environmental footprint.

## Conservation of Biodiversity

P63-64

Target effects on and contributions to biodiversity

Establish Integration Index

Conducting biodiversity conservation/education programs

Implement at

**100%**  
of locations in Japan

## Benefiting Customers and Society

P43-54

Provide Green ICT to reduce CO<sub>2</sub> emissions by customers and society

Eliminated **5.6m tons**  
(cumulative since FY 2009)

Environmental efficiency factors of green products

Achieved

**3.2**

(ref. FY 2008)

Recycle ICT business equipment globally

**93.3%**  
reuse rate

Increase proportion of renewable energy used

**4.8 times**

(ref. FY 2007)

## Pursuing Internal Reforms

P55-62

P65-69

Reduce emissions of greenhouse gases

**11.7%**  
reduction

(ref. FY 1990)

Reduce CO<sub>2</sub> emissions in domestic distribution

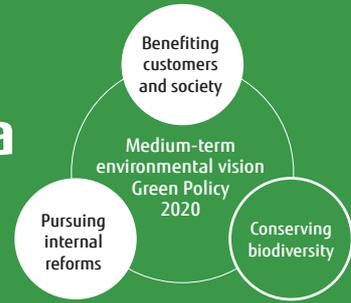
**18%**  
reduction

(ref. FY 2008)

# Highlights in 2010

## Green Policy Innovation: Working with Customers to Create a Prosperous Low-Carbon Society

The Fujitsu Group promotes Green Policy Innovation as a project to lower customers' environmental burdens using Green ICT. This initiative seeks to seed the new technologies for reducing the burden on the environment, and put them into practical use through in-house practice. By providing a more advanced, greater variety of Green ICT, we work with our customers to realize a prosperous, low-carbon society.

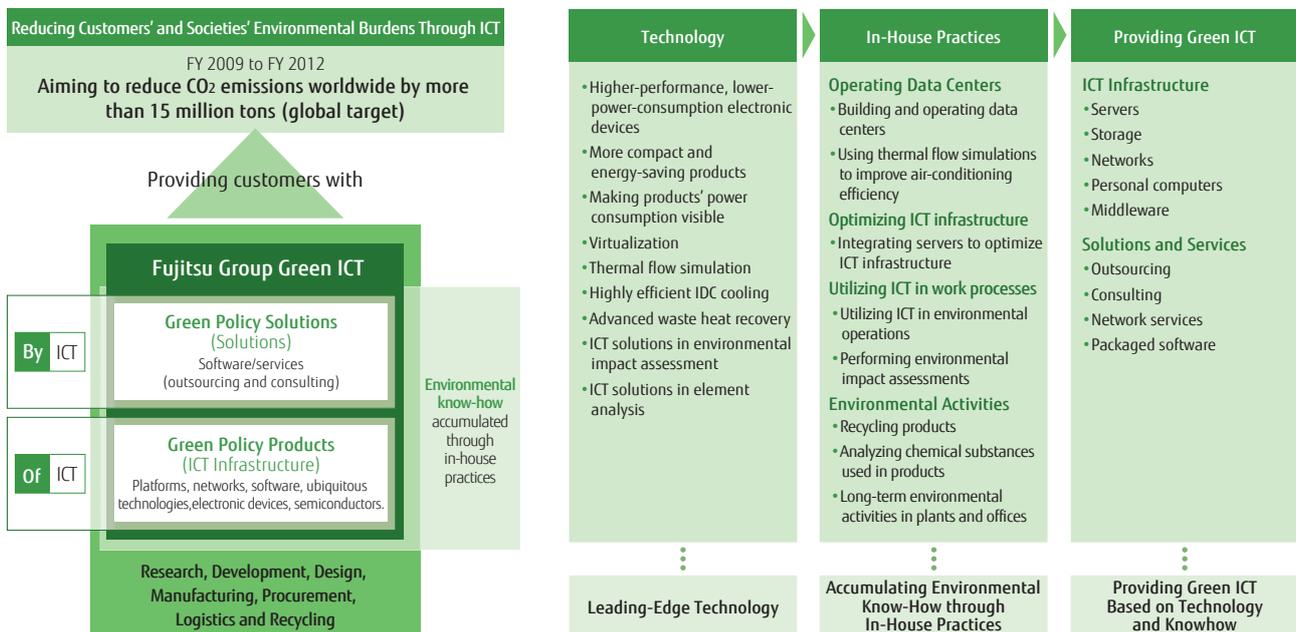


### Our Global Target: Reduce CO<sub>2</sub> Emissions by More than a Cumulative 15 Million Tons over Four Years

Green Policy Innovation is a project to provide the products, solutions and services that embody environment-conserving technologies and knowhow developed within the Fujitsu Group with the aim of reducing the environmental burdens of customers and society as a whole.

As a global ICT enterprise group, Fujitsu has set a global target to make a significant contribution to cutting the emission of greenhouse gases. This calls for reducing CO<sub>2</sub> emissions by more than a cumulative 15 million tons over the four-year period from FY 2009 to FY 2012. The whole Fujitsu Group is actively engaged in achieving this target.

Innovation, in the shape of new technologies that contribute to reducing environmental burdens, is the driving force of this project. To realize a prosperous, low-carbon society, the development and practical application of a more advanced, greater variety of Green ICT is essential. The Fujitsu Group promotes developing leading-edge Green ICT, and works toward practical use of new technologies for reducing environmental burdens through in-house practice (as reference models). Technologies that prove reliable and effective are leveraged in the Green ICT we offer to our customers, further strengthening our Green Policy Innovation initiative.



## In-House Implementation of Advanced Green ICT

To achieve the practical use of new technologies for reducing environmental burdens, they must be applied in-house (as the "reference") as the essential validation of their reliability and effectiveness.

By adopting such load-reducing new technologies promptly within the Fujitsu Group, we can use the accumulated expertise and know-how in new products, solutions and services. Through this practical implementation approach using new technologies in the workplace, whether in R&D, offices, factories, data centers, or in management, we aim to acquire a wide range of practical know-how and use ICT to further improve the quality of Fujitsu's environmental management.

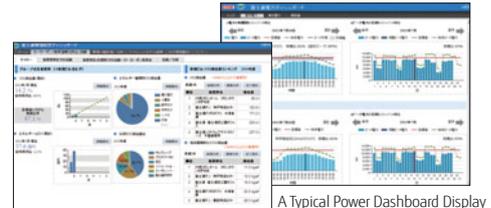
Tetsuzo Ozawa, Director, Environmental Reference Department, Corporate Environmental Strategy Unit



### Environmental Management Dashboard and Power Dashboard

We have established and started to introduce Environmental Management Dashboards in daily environmental management. These automatically collect information from various sources, derive targets for management and actions by processing it, and make it visible on purpose-oriented displays to give support in the decisions and judgments of executives and managers, and the individual actions of general employees.

Similarly, Power Dashboards have been created to make each business location's electric power consumption visible, and have been used to save summertime electricity usage and to minimize the effects of earthquakes.



A Typical Environmental Management Dashboard Display

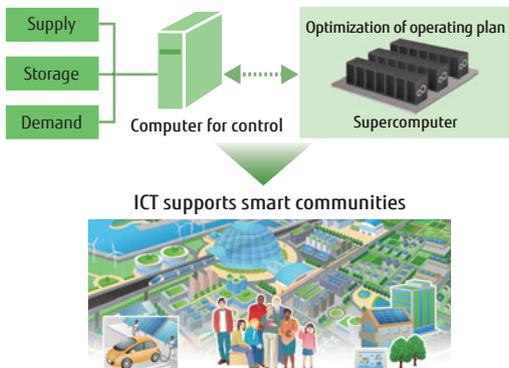
A Typical Power Dashboard Display

### Optimizing Natural Energy Usage

The amount of natural energy supply is weather-dependent, so achieving the best distribution balance between supply and electricity storage is necessary to stabilize availability and spread utilization. At our Kawasaki Plant, the solar power generation system is combined with electrical storage batteries, and supercomputer simulations are being used to control the storage batteries, to develop the technology to use excess electrical power and to smooth loads. This technology will contribute to realizing the smart communities and the smart cities in the future.



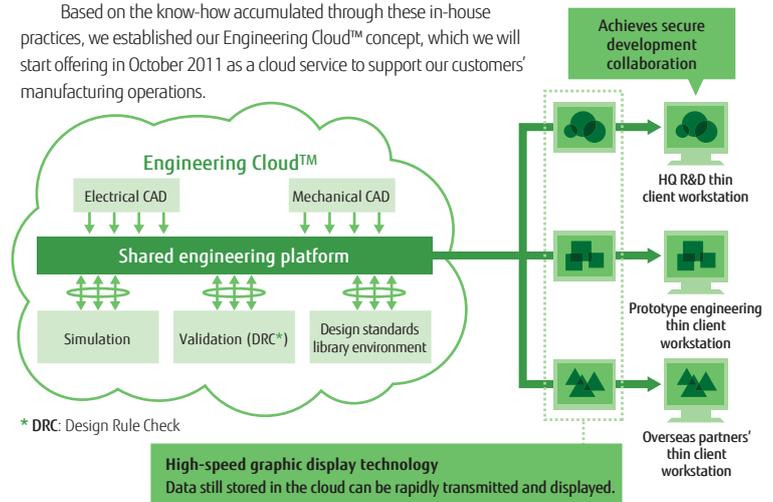
Solar panels installed at our Kawasaki Plant



### Using the Cloud in Manufacturing (Engineering Cloud™)

We are moving CAD, analysis, simulations, and product databases, which are all essential to manufacturing, into the cloud. Concentrating servers offers reductions in power consumption and costs and promises to accelerate technology development. High-speed graphic compression techniques developed within the Fujitsu Group are used to smooth remote network access and high-speed graphic displays, while adoption of the thin client approach provides a pleasant, stress-free operating environment for manufacturing.

Based on the know-how accumulated through these in-house practices, we established our Engineering Cloud™ concept, which we will start offering in October 2011 as a cloud service to support our customers' manufacturing operations.



\* DRC: Design Rule Check

## TOPICS

### Numazu Software Development Cloud Center

Between FY 2008 and FY 2010, this center used our own products to bring together six separated domestic facilities for the development environment, forming a cloud-based concentration of the servers. Through this process, it reduced the number of servers from about 1,800 to about 1,000, achieving a cumulative reduction in CO<sub>2</sub> emissions of 2,660 tons over the three years. In future, this know-how of concentrating servers and creating a cloud environment will contribute to a wide range of reductions in environmental burdens of our own and our customers'.

We are also making power consumption visible, so that the

amount used by individual ICT equipment can be identified, switching off storage devices by the linkage to servers, and measuring the temperatures of air at the inlets and outlets of servers so that local hot spots and cold spots can be reduced to raise the efficiency of air conditioning. These measures, among others, will reduce our CO<sub>2</sub> footprint by 1,036 tons in FY 2011, and we remain committed to further reductions.



An inspection tour course of the Numazu Software Development Cloud Center

# Highlights in 2010

## Green Policy Innovation: Working With Customers to Create a Prosperous Low-Carbon Society

### Promoting Green Policy Innovation 2 Reducing Customers' Environmental Footprints through ICT

#### Japan Advanced Institute of Science and Technology (JAIST) in Hokuriku Up to 151.5 Tons of CO<sub>2</sub> Reduction per Year

##### Working to Increase the Efficiency of Server Utilization

JAIST was founded in 1990 as a national graduate school to perform world-class advanced technology research and to provide post-graduate education. Its campus is among richly wooded hills overlooking the Kaga Plain and it is actively engaged in environmental preservation.

Their environmental approach is reflected in system configuration. For example, thin client computers were adopted for the personal use of students, academic and administrative staff in 2006, and about 120 servers were used to configure the internal ICT environment under integrated control.

In line with this approach, JAIST focused on improving the efficiency of server utilization. Servers were prepared based on predictions of the maximum access numbers and peak load times, but in reality, the usage frequency of servers differed between students, academic and administrative staff and varied with time. JAIST therefore aimed to configure an ICT system that provided the necessary computing environment as and when it was needed.



Presentation of Minister of the Environment Award for the Prevention of Global Warming  
In December 2010, the "private cloud" implemented at JAIST, with its significant reduction in ICT equipment energy usage, received the Ministry of the Environment's 2010 award for activities to prevent global warming (Category: Technology Introduction and Diffusion).

##### Integration and Virtualization to Increase Server Utilization Efficiency, Cut CO<sub>2</sub>

JAIST saw virtualization of servers and a cloud-based computing environment as central to optimizing the usage of every individual server. JAIST worked with Fujitsu on the validation of small-scale environments over several years and finally established the university's own private cloud environment in 2010.

This private cloud integrated and virtualized the former about 120 servers in only 51 physical servers, enabling a dramatic increase in usage efficiency. Air-conditioning efficiency was also increased by ducting cooled air directly into the server racks and optimizing the arrangement of racks.

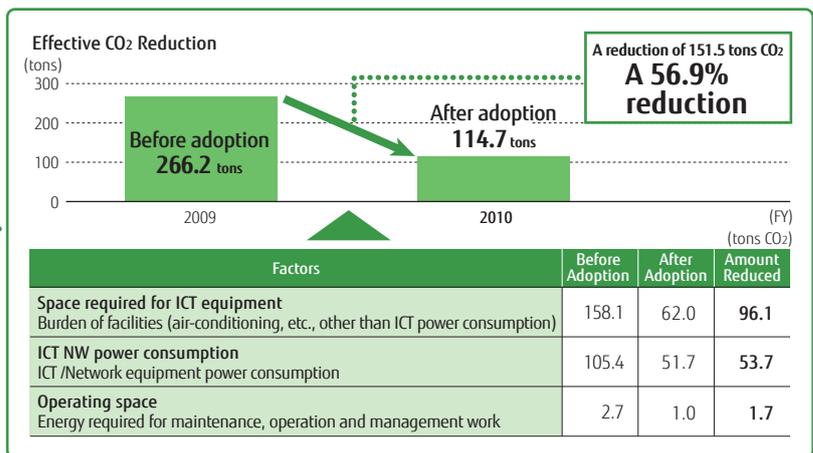
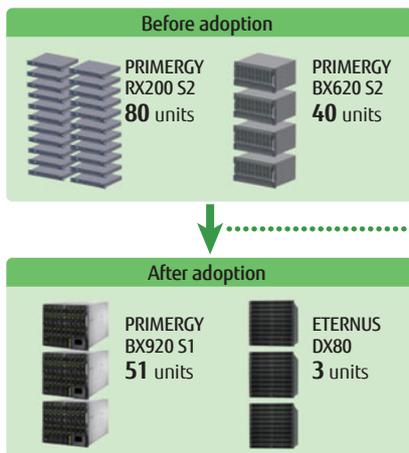
Validation of the environmental efficiency of this system revealed that its introduction reduced electrical power and space to save up to 151.5 tons of CO<sub>2</sub> per year, a reduction of 56.9%.



Special ducts that supply cooled air directly within racks and improve server cooling efficiency

The effective introduction of ICT throughout society leads to its enhanced prosperity. The Fujitsu Group is committed to providing the Green ICT through which both we and our customers can create a prosperous low-carbon society.

**WEB** Green Policy Innovation—a project to reduce the environmental burdens by adopting Green ICT  
<http://www.fujitsu.com/global/about/environment/green-it/>





Japan Advanced Institute of Science and Technology, Hokuriku  
(a national university corporation)

Founded: October 1990  
No. of students: 946 (as of May 2011)  
URL <http://www.jaist.ac.jp/index-e.html>



### Stakeholder's Voice

#### Taking up the Challenge of System Efficiency Improvements

Ever since the school opened, we have consistently sought to reduce power consumption and configure environmentally friendly systems by choosing low-power-consuming hard disks.

This time, by improving the efficiency of server usage, we have significantly reduced the number of servers and the power consumption. At the same time, we greatly reduced the space they required and by making changes to the cooling system we have also increased air-conditioning efficiency.

We continue to address the challenge of ongoing improvements to system efficiency.



**Mikifumi Shikida**, Associate Professor  
Center for Information Science,  
Japan Advanced Institute of  
Science and Technology

### A Word from Fujitsu

#### Partnering with JAIST; Always Aiming for Leading-Edge Technology

JAIST had already been working on the virtualization of clients, and had completed this for all users. This was where the present system started, and the customer's insistence on being right at the forefront of advances was a great example for our sales and system engineers. In future, we intend to continue as a useful partner, working closely with JAIST.



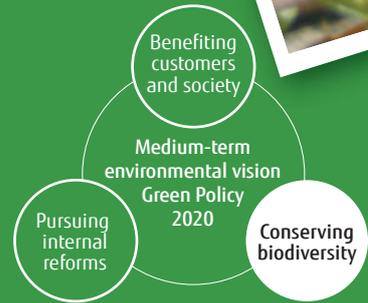
**Akio Nagata**, Fujitsu Hokuriku Systems  
**Noriaki Sunada**, Fujitsu Hokuriku Branch  
**Yusuke Yamazaki**, Fujitsu Hokuriku Systems



## Highlights in 2010

# “Let’s Make a Nationwide Dandelion Front Map Together!”

Interest in or fascination with the plants and animals familiar to us in our daily lives can be a starting point for the conservation of biodiversity. The call “Let’s Make a Nationwide Dandelion Front Map Together !” springs from the idea that ICT could become the occasion for turning peoples’ interest towards familiar animals and plants.



### STEP 1 By Fujitsu Employees and Family Members

#### Using ICT to Create Enjoyable Opportunities for Encountering Nature

Japan’s National Strategy for the Conservation and Sustainable Use of Biological Diversity in 2010 included as one of its targets conservation of the special features of plants, animals and ecosystems characteristic of specific localities, and the formation of a network of such ecosystems to maintain and restore biodiversity by 2020.

To contribute to this conservation of biodiversity at the local level, in April 2010 the Fujitsu Group started to survey the distribution of dandelions using our own ICT.

The survey made use of Fujitsu FIP Corporation’s Mobile Photo System and Fujitsu’s On-Demand Virtual System Service\*, accumulating photos of dandelions taken by mobile phones with GPS functions in a graphic database, using location information and mapping to view and analyze the data. The survey was performed by Fujitsu employees and their families from April 2010 through February 2011, and received some 1,400 graphic dandelion data sets. Employees who participated reported that the project enabled them to enjoy time with their families while bringing them closer to nature.

\* On-Demand Virtual System Service: The ICT infrastructure including servers and storage was provided as a virtualized cloud service using network access to Fujitsu data centers.

### STEP 2 Citizen Participation in Activities

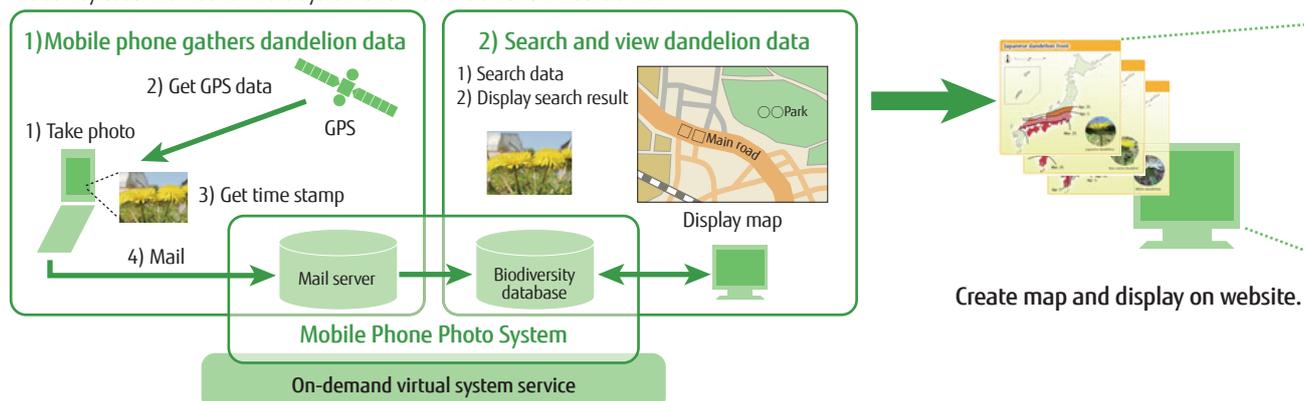
#### Spreading Interest in Biodiversity to as Many as Possible

This success encouraged us to believe that a familiar plant like the dandelion could serve to increase interest in biodiversity throughout Japan, so survey participation was extended from employees to the general public. This started as “Let’s Make a Nationwide Dandelion Front Map Together !” in February 2011.

The survey had two main objectives. One was to investigate the position of dandelions in the biosphere and the effects of global warming by mapping the dandelion fronts nationwide. The other was to bring people closer to nature and so spread awareness of the importance of biodiversity among as many people as possible.

People were able to participate simply by taking photos on their GPS-equipped mobile phones and attaching the location and time information when they mailed the photo to the survey E-mail address.

The survey used the Mobile Photo System and the On-Demand Virtual Service.





**STEP 3 Finalizing the Nationwide Dandelion Front Map**

**Shaping a Shared Desire to Cherish the Natural Environment**

From the new start in February 2011 through the following June, a total of some 9,700 graphic data sets on dandelions were gathered.

Aichi University of Education (a national university) cooperated with Fujitsu in classifying the collected dandelion data into indigenous and non-native varieties, estimating the date on which they flowered, and created the first Japanese nationwide map of dandelion fronts that distinguished between non-native and indigenous varieties (including specifically the white dandelion\*, *taraxacum albidum*), and published them on the website.

ICT links and shapes the wishes of those who value nature. Fujitsu, as an ICT enterprise, is committed to benefitting biodiversity through various uses of ICT, and will continue to configure regional bio-networks and databases for bio-information.

\* **White Dandelions:** This variety thrives in western Japan, and the northward expansion of its habitat is attributed to global warming.

**Stakeholder's Voice**

**Biodiversity as It Affects Dandelions**

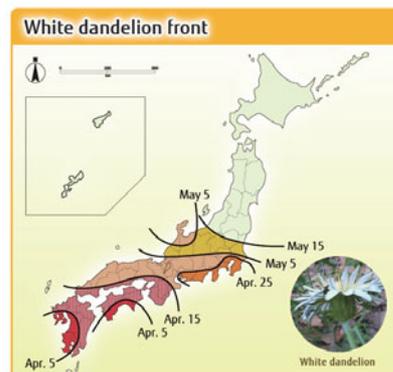
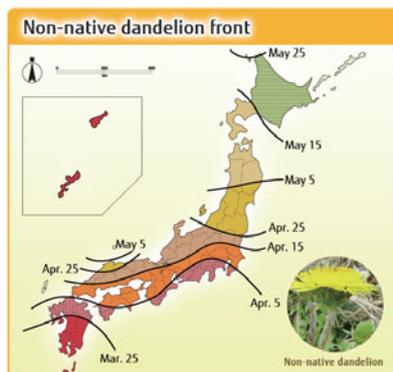
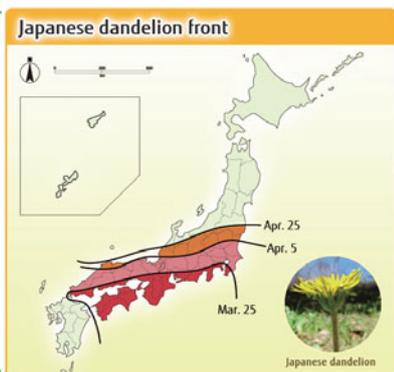
We who live in the 21st century have no choice but to form a sustainable society based on biodiversity. Conserving biodiversity is also vital to make possible the continued future use of biological resources. Investigating specific living things also reveals to us how we are affecting them. This includes dandelions.

For example, if we examine the areas in which the indigenous Japanese dandelion (a typical harbinger of spring) is found, we see that its distribution shrank as urbanization spread. Conversely, if we examine where it still thrives, we will find certain urban areas where environments that predate Japan's era of high economic growth still survive from when the Japanese lived in harmony with nature. The Japanese dandelion may even provide clues on how to live in comfort and peace—in an environment in harmony with nature.

By all means let us try to think of biodiversity in terms of the living things most familiar to us, starting with the humble dandelion.



**Mikio Watanabe**, Professor  
Aichi University of Education  
(a national university)



# Fujitsu Group Environmental Management

We recognize environmental protection to be an imperative for us as a global ICT corporation and, together with our customers and society, we strive for sustainable growth and development while working to reduce our environmental burden.

## Operating in Harmony with Nature as the Starting Point for Fujitsu Environmental Management

The Fujitsu Group has pursued "operating in harmony with nature" since its founding in 1935. Environmental conservation is one of our highest priorities, and our environmental management is guided by Corporate Values enshrined in the Fujitsu Way, that "in all our actions, we protect the environment and contribute to society."

## Growing Together with Society and Our Customers

The realization of a low-carbon society is one of the central challenges for humanity in the 21st century. To achieve this, it will be necessary for society as a whole to find more environmentally friendly ways to work and live. Multifaceted support from ICT is an increasingly important part of these efforts.

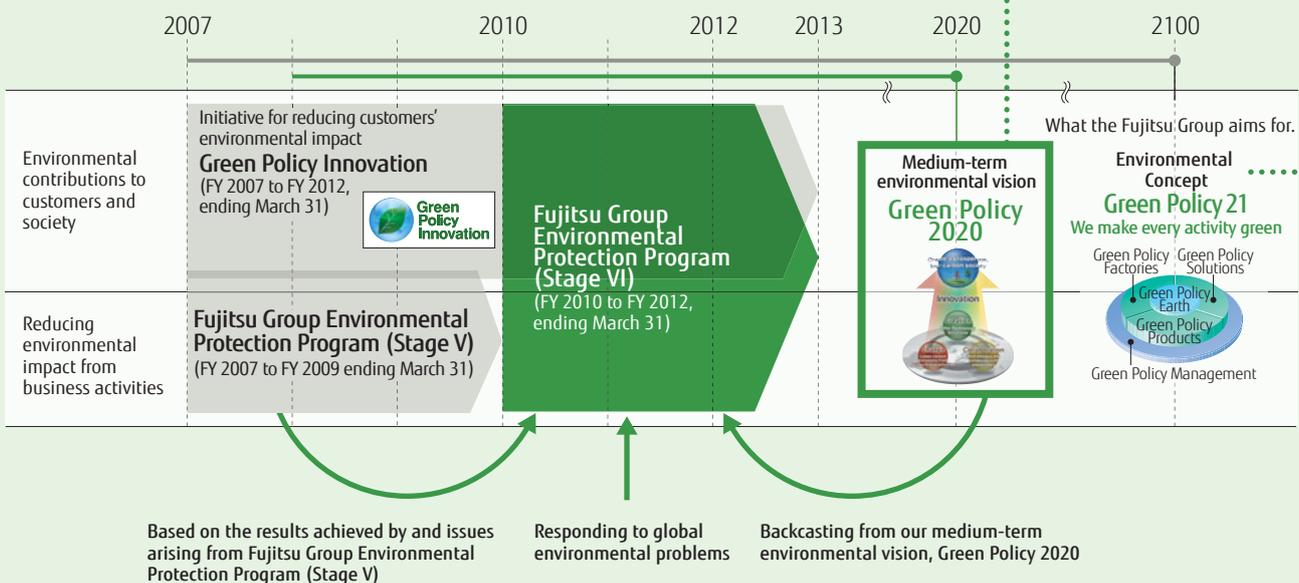
Given this background, we revised the Fujitsu Group Environmental Policy in April 2011. The Fujitsu Group Environmental Policy spells out our ideals and directions to promote environmental management that reflects the uniqueness of the Fujitsu Group enterprise. In the latest revision, we state that "We proactively promote environmentally conscious business activities to help the environment and economy coexist harmoniously," as one of those directions. While it goes without saying that we contribute to reductions in both our customers' and society's environmental burdens, this policy aims to grow our business to achieve sustainable growth and development for the Fujitsu Group along with our customers and society.

**WEB** Fujitsu Group Environmental Policy  
<http://www.fujitsu.com/global/about/environment/approach/policy/>

### The History of Fujitsu's Environmental Activities

- 1935 Park-style design adopted for new Kawasaki Plant at the suggestion of Fujitsu's founder, Manjiro Yoshimura
- 1938 Kawasaki Plant completed
- 1972 Environmental control sections established at each plant
- 1989 Environmental Committee established
- 1991 Environmental Engineering Center established
- 1992 Fujitsu's Commitment to the Environment formulated
- 1993 Fujitsu Environmental Protection Program (Stage I) formulated
- 1997 All domestic manufacturing sites certified ISO 14001 compliant
- 2000 Corporate Environmental Strategy Unit established
- 2002 Fujitsu Group Environmental Policy established
- 2006 ISO 14001 globally integrated certification acquired, including overseas Group companies
- 2007 Environmental Burden Reduction Project by Green ICT, Green Policy Innovation, started
- 2008 Green Policy 2020 medium-term environmental vision formulated
- 2009 Biodiversity Action Principles formulated
- 2010 Fujitsu Group Environmental Protection Program (Stage VI) formulated

### Fujitsu Group Environmental Activities



## Based on Explicit Concepts and Vision

To instill all Group employees with the concept of “operating in harmony with nature,” which is the starting point for environmental management, we stipulate our “Green Policy 21” environmental concept. Based on this concept, we implement continuing environmental activities in all our business areas.

Furthermore, Green Policy 2020 is our medium-term environmental vision, which indicates the directions and roles that the Fujitsu Group must play as targets for 2020. Green Policy 2020 stipulates three targets, benefiting our customers and society, pursuing internal reforms, and conserving biodiversity, and sets up specific topics to work on in achieving these targets.

**WEB** Environmental Concept “Green Policy 21”  
<http://www.fujitsu.com/global/about/environment/approach/green-policy21/>  
 Medium-Term Environmental Vision “Green Policy 2020”  
<http://www.fujitsu.com/global/about/environment/approach/green-policy2020/>

## Reducing Environmental Burdens Based on Global Targets

Since December 2007, the Fujitsu Group has been promoting the Green Policy Innovation initiative to reduce our customers’ environmental burden using green ICT to achieve the Green Policy 2020 vision’s goals. Under the initiative, we provide customers with solutions and ICT infrastructure that leverage the accumulated technologies and expertise of the Fujitsu Group with the aim of lessening the environmental burden from companies and society in general.

In December 2009, we established the target of helping to reduce CO<sub>2</sub> emissions by at least 15 million tons worldwide over the four years from FY 2009 through 2012, and have been promoting the provision of green ICT while working for cooperation with local regions throughout the world.

## New Environmental Action Plan Strengthens Environmental Activities Globally

Then, in April 2010, we created the Fujitsu Group Environmental Protection Program (Stage VI) that covers FY 2010 through FY 2012 based on back projections from our Green Policy 2020 vision and recent global environmental issues such as climate change and biodiversity conservation (see pages 37 and 38).

We will continue to reliably implement environmental action plans as a unified group and work to realize a prosperous low-carbon society.

### First Certification as an “Eco-First Company” in the IT Services Industry

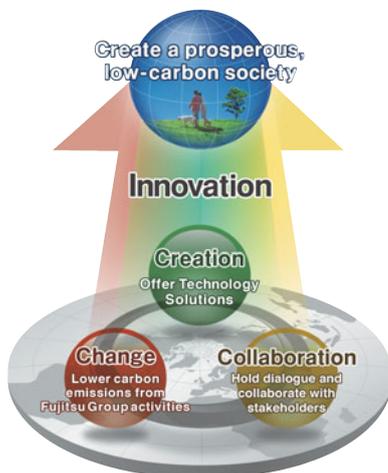


In September 2010, the Fujitsu Group was certified as an Eco-First Company under the Ministry of the Environment’s Eco-First Program. This was the first such certification in the IT services industry.

The Eco-First Program encourages even further actions related to environmental protection by industry leading companies. Under this system, each corporation promises the Minister of the Environment that they will make efforts to protect the environment, for example, by measures to counter global warming or conserve biodiversity.

### Medium-Term Environmental Vision: Green Policy 2020

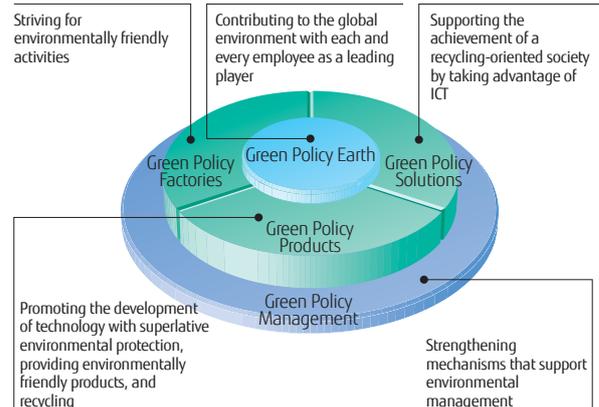
Fujitsu’s Green Policy 2020 vision proposes a transformation of the Fujitsu Group into an organization with low-carbon corporate activities while it works to create technology solutions in collaboration with a variety of independent parties. It envisions these efforts realizing a low-carbon and prosperous society.



### Environmental Concept: Green Policy 21

At Fujitsu, we place our global scale environmental activities, called “Green Policy Earth,” at the core of our environmental concept and position the specific activities to implement these as our Green Policy Products, Green Policy Factories, and Green Policy Solutions. We further position the mechanism that supports these activities as Green Policy Management.

#### We make every activity green



# Targets and Results for the Fujitsu Group Environmental Protection Program (Stage VI)

Fujitsu instituted a new action plan for the period from FY 2010 through FY 2012 and aims to achieve its goals while practicing the PDCA cycle steadily.

## Setting up an Action Plan and Targets for the Period from FY 2010 through 2012

In April 2010, we created the Fujitsu Group Environmental Protection Program (Stage VI) to run from FY 2010 to the fiscal year ending March 31, 2013 (FY 2012).

The program is based on the three targets established in the Green Policy 2020 and defines six key areas: strengthening advanced green ICT R&D, improving the environmental value of products and services and strengthening the development and provision of green ICT, strengthening efforts to reduce the environmental burden from the Group itself, strengthening our foundation for environmental management, promoting activities that make environmental contributions to society, and promoting

activities that conserve biodiversity. Moreover, we have established a further 18 items to serve as specific program targets.

## All FY 2010 Targets Achieved

We succeeded in achieving all of the targets set in the Fujitsu Group Environmental Protection Program (Stage VI) for FY 2010.

Furthermore, since we achieved results significantly better than the targets for certain of the items (R&D on advanced green ICT, environmental efficiency factors, renewable energy, CO<sub>2</sub> reduction in distribution and transportation), we raised the targets.

We will continue to use the PDCA cycle and work toward the FY 2012 goals.

**WEB** Targets of Fujitsu Group Environmental Protection Program (Stage VI) <http://www.fujitsu.com/global/about/environment/management/program/stage6/>

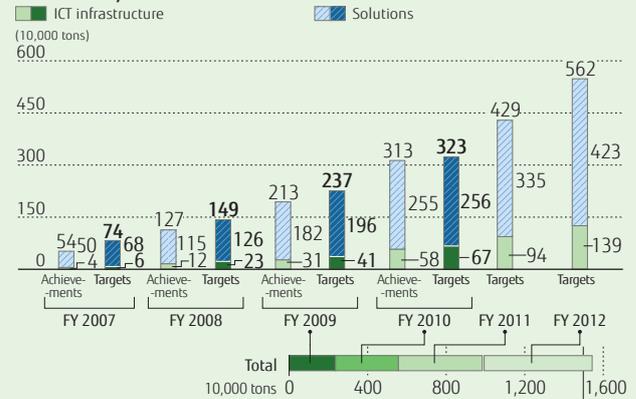
Fujitsu Group Environmental Protection Program (Stage VI)

Green Policy 2020 Three Targets	Action Plan Item	Item Breakdown	Targets (FY 2010)	Performance (FY 2010)	Targets (FY 2011)	Targets (FY 2012)	Status	Related Pages
Benefiting customers and society	Strengthening advanced green ICT R&D	Strengthen advanced green ICT R&D •Develop technologies for next-generation datacenters and networking that will double overall efficiency of ICT products by end of FY 2012. •By end of FY 2012, more than 70% of all technology developed will be solutions for reducing the burden on the environment.*	•1.2 times •25%	•1.3 times •58%	•1.5 times •60%	•2 times •70%	✓	P43-
		Develop & deliver green ICT to contribute to customers and society. Provide green ICT that will reduce cumulative CO <sub>2</sub> emissions by 15 million tons over FY 2009-12 period.	5.26 million tons	5.60 million tons	9.55 million tons	15 million tons or more	✓	P38
	Improving the environmental value of products and services, and enhancing the development and delivery of green ICT	Develop and provide Eco-friendly products (Super Green products). With respect to newly developed green products in all departments, Super Green products that contribute to reduced environmental footprints through low energy and resource demands must comprise 30% by end of FY 2012.	10% or more	17%	20% or more	30% or more	✓	P45-
		Develop and provide Eco-friendly products (environmental efficiency factors). With respect to newly developed green products in all departments, the environmental efficiency must be raised to 4.0 times the FY 2008 value by end of FY 2012.*	Raise to 1.5	Raise to 3.2	Raise to 3.5	Raise to 4.0	✓	P45
		Promote product recycling. Sustain 90% resource reuse rate of business ICT equipment globally at Fujitsu recycling centers.	Sustain 90%	93.3%	Sustain 90%	Sustain 90%	✓	P49-
		Develop and provide environmental solutions. •Promote the development and provision of environmental solutions in all areas, including industry, transport, business, households, and energy conversion sectors. •Expand provision of environmental solutions in major regions, including Japan, Europe, Americas, and Asia/Pacific.	Departmental and regional coverage rate: 70%	Departmental and regional coverage rate: 78%	Departmental and regional coverage rate: 85%	Departmental and regional coverage rate: 100%	✓	P53-
Pursuing internal reforms	Enhancing efforts to reduce the Fujitsu Group's environmental footprint	Reduce greenhouse gas emissions. Reduce total greenhouse gas emissions associated with manufacturing globally to 6% below FY 1990 levels by end of FY 2012 (CO <sub>2</sub> : 5% reduction, other greenhouse gases: 20% reduction).	2.5% reduction	11.7% reduction	3% reduction	6% reduction	✓	P55-
		Reduce greenhouse gas emissions (renewable energy) Increase use of renewable energy sources to 10 times FY 2007 levels by end of FY 2012.*	2.7 times	4.8 times	10 times	10 times	✓	P55-
		Reduce CO <sub>2</sub> in transport and distribution. Reduce CO <sub>2</sub> emissions from domestic transport to 15% below FY 2008 levels by end of FY 2012.*	9% reduction	18% reduction	16% reduction	15% reduction	✓	P62
		Promote business partners greenhouse gas reduction. Promote procurement from business partners that limit or reduce greenhouse gas emissions.	60% materials suppliers procurement rate ("no. of companies" rate)	62.7%	80%	100%	✓	P61

## Green Policy Innovation—Achievements in Reducing CO<sub>2</sub> Emissions

Since FY 2007, the Fujitsu Group has been promoting the environmental burden reduction project by Green ICT, Green Policy Innovation. In FY 2009, Fujitsu set a global target of cutting CO<sub>2</sub> emissions by more than 15 million tons over a four-year period from FY 2009 to 2012. During FY 2010, we exceeded our targets and contributed to a total CO<sub>2</sub> reduction of 3.23 million tons, comprising 0.67 million ton from providing Green Policy Products, which are eco-friendly ICT infrastructure products, and 2.56 million tons from providing Green Policy Solutions, which are ICT solutions that contribute to reducing environmental burdens for a cumulative total of 5.6 million tons from FY 2009.

## CO<sub>2</sub> Emissions Reduction Targets and Achievements through Green Policy Innovation



Green Policy 2020 Three Targets	Action Plan Item	Item Breakdown	Targets (FY 2010)	Performance (FY 2010)	Targets (FY 2011)	Targets (FY 2012)	Status	Related Pages
Enhancing efforts to reduce the Fujitsu Group's environmental footprint		Factory improvements (chemicals) Reduce output of priority chemicals to 10% below FY 2007 levels by end of FY 2012.	4% reduction	48% reduction	7% reduction	10% reduction	✓	P58
		Factory improvements (waste) •Reduce waste generation to 20% below FY 2007 levels by end of FY 2012. •Maintain zero waste emissions at factories in Japan.	•11% reduction •Status maintained	•20.1% reduction •Status maintained	•13% reduction •Status maintained	•20% reduction •Status maintained	✓	P57-
		Office improvements Achieve four-star rating or better under the Green Office plan for every office by end of FY 2012.	Japan: trials using new standard Internationally: field survey	Japan: trials using new standard Internationally: field survey (completed)	Japan: 70% Internationally: draft evaluation standards	Japan: 100% Internationally: trial implementation	✓	P60
Pursuing internal reforms	Strengthening environmental governance	Continuously improve globally integrated environmental management systems. •Promote further ICT deployment for environmental management, build smart environmental management systems. •To improve environmental performance, by the end of FY 2012 we intend to apply a framework of assessments for the extent of target achievement and the compliance situation of 100% of Group main domestic production companies.	•Customization and trial of remote communications •Establishment of performance assessment procedures	•Trial implementation •Performance assessment procedures established	•Block application rate: 50% •Trial implementation	•Block application rate: 75% •Expand as far as domestic manufacturing group companies	✓	P66-
		Promote environmental management through communications with stakeholders. Promote environmental communication at all levels to improve environmental management.	Improved communication of environmental information	Both internal and external information dissemination improved	Improved communication of environmental information	Improved communication of environmental information	✓	P69
Preserving biodiversity	Promoting environmental contributions to society	Increase environmental awareness among all staff through community-based environmental actions. •Launch Act-Local-System by end of FY 2010 to globally share information on social contribution activities around the world. •Sustain environmental social contributions activities around the world and promote activities that will contribute more to local communities through utilizing Act-Local-System.	•Construction and management of a domestic network, Construction and management of an international network •Japan: once a year Internationally: once every three years	•Network implementation •Japan: Implemented at all business sites Internationally: implemented at 54% of business sites	•Management of the domestic network, Management of the international network •Japan: once a year Internationally: once every three years	•Management of the domestic network, Management of the international network •Japan: once a year Internationally: once every three years	✓	P65
		Reduce impact of company's operations on biodiversity. •Develop numerical indicators to measure impact of operations on biodiversity and build system to expand contribution of ICT to reducing that impact. •Promote procurement from business partners that work to preserve biodiversity.	•Construction of the Fujitsu Group BD integration index to evaluate impact on biodiversity •60% materials suppliers' procurement rate ("no. of companies" rate)	•Completion of numerical indicator development •60.9%	•1.5% reduction in level of impact (in main business areas) compared to FY 2009 as evaluated by the BD integration index •80%	•3% reduction in level of impact (in main business areas) compared to FY 2009 as evaluated by the BD integration index •100%	✓	P63-
Preserving biodiversity	Promoting efforts to preserve biodiversity	Contribute to community-building that conserves biodiversity. •Build case studies that contribute to biodiversity through ICT in all major offices by end of FY 2012. •Conduct biodiversity preservation/education programs in all offices by end of FY 2012.	•Implementation of survey to construct a model to contribute to biodiversity •Japan: once a year Internationally: once every three years	•Survey implementation •Japan: Implemented at all business sites Internationally: implemented at 30% of business sites	•Pilot project based on survey results •Japan: once a year Internationally: once every three years	•Development at main business sites •Japan: once a year Internationally: once every three years	✓	P63-

\* Target values were increased.

# Environmental Accounting

To promote environmental management, we introduced environmental accounting in FY 1998, and by evaluating our environmental protection activities, we have clarified the issues and promoted sharing of the results.

## Basic Environmental Accounting Elements

While conforming to the Ministry of the Environment's Environmental Accounting Guidelines 2005, the Fujitsu Group's environmental accounting adds estimated benefits based on Fujitsu's own approach to environmental accounting.

This accounting covers Fujitsu itself plus 30 affiliated companies, mainly in the manufacturing system in Japan and overseas. Note, however, that other affiliated companies concerned with environmental solutions, which have been added to the range covered by "R&D costs and benefits" since FY 2010, are also included in this accounting.

There were two additional changes to accounting coverage for FY 2010: after the transfer of Fujitsu Media Devices Limited it was excluded from the totals, and Fujitsu Technology Solutions (Holding) B.V. was added.

## Costs and Economic Benefits in FY 2010

The results of this accounting for FY 2010 showed costs of 33.11 billion yen (a 10.1% increase from the previous year) and the economic benefits were 59.71 billion yen (a 10.9% increase from the previous year). Thus both costs and benefits grew by over 10%. Also, our capital investment was 4.57 billion yen (a 90.4% increase from the previous year).

Note that the influence of the changes in the coverage of accounting was that when the values for the two companies were subtracted, costs were reduced by about 200 million yen and benefits were reduced by about 800 million yen.

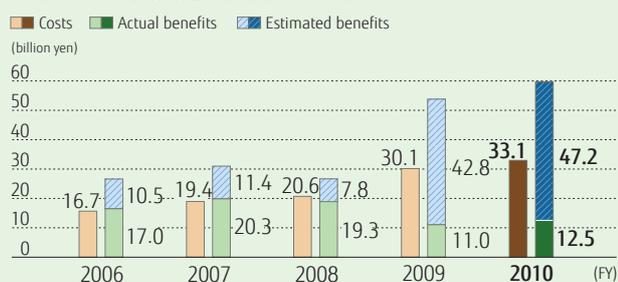
## Reasons for Changes in Costs and Economic Benefits

Costs increased by about 3.1 billion yen compared to the previous year. This is because in contrast with management activities, whose costs fell by about 600 million yen in association with reductions in environmental advertising costs, the cost of R&D increased significantly, by about 4.1 billion yen. R&D costs grew substantially as a result of promoting R&D on products and solutions that contribute to environmental protection in line with "Benefiting Customers and Society" which is a major goal of the Fujitsu Group's medium-term environmental vision Green Policy 2020.

Economic benefits increased by about 5.9 billion yen compared to the previous year. Although the benefits from our management activities fell by about 600 million yen, benefits from pollution prevention increased by about 1.5 billion yen, benefits from resource circulation increased by about 1.4 billion yen, and benefits from R&D increased by 3.4 billion yen. The benefits from management activities fell because environmental advertising, which is a factor in reducing costs, was cut back, resulting in fewer estimated benefits from that advertising. The increase in the benefit from pollution prevention was due to aggressive promotion of investments aimed at preventing both air pollution and water pollution in our affiliated companies. Specifically, this was due to an increase in the risk avoidance benefit, which is an estimated benefit from prevention efforts. Our benefit from resource circulation increased due to the influence of changes in the sale price of valuable items no longer needed at affiliated companies, which in recent years have been influenced by these changes. With regards to the benefit from R&D, to contribute to reducing the environmental impacts of our customers and society, we have strengthened our Green ICT lineup, so providing these products to our customers led to an increase in economic benefits as calculated by our proprietary method of calculating these estimated benefits.

Thus R&D costs and benefits both rose significantly in FY 2010. In the future, we will continue to refine environmental management by evaluating our environmental protection activities using environmental accounting.

### Trends in Costs and Economic Benefits



**WEB** Environmental Accounting  
<http://www.fujitsu.com/global/about/environment/management/accounting/>

Item	Main areas covered	Capital investment (billion yen)	Costs (billion yen)	Economic benefits (billion yen)	Related pages
Business area costs/benefits	Pollution prevention costs/benefits	1.09(+0.17)	4.82(+0.01)	7.18(+1.49)	P57~58
	Global environmental conservation costs/benefits	1.70(+0.58)	2.84(-0.07)	1.38(+0.09)	P55~56, 60, 62
	Resource circulation costs/benefits	0.02(+0.01)	2.87(-0.30)	10.64(+1.42)	P57~58, 60
Upstream/downstream costs/benefits	Collection, recycling, reuse, and proper disposal of products, etc.	0.00(±0.00)	0.82(±0.00)	0.44(+0.05)	P49~50, 61
Administration costs/benefits	Provision and operation of environmental management systems, environmental education of employees, etc.	0.82(+0.74)	3.51(-0.60)	0.93(-0.61)	P66~69
R&D costs/benefits	Research and development on products and solutions that contribute to environmental protection, etc.	0.85(+0.58)	17.15(+4.08)	39.14(+3.42)	P43~48, 51~54
Social activity costs	Donations to, and support for, environmental groups, etc.	0.00(±0.00)	0.06(+0.01)	—	P63~65
Environmental remediation costs/benefits	Restoration and other measures related to soil and groundwater contamination, etc.	0.08(+0.08)	1.03(-0.08)	0.00(±0.00)	P59
<b>Total</b>		<b>4.57(+2.17)</b>	<b>33.11(+3.05)</b>	<b>59.71(+5.85)</b>	—

• Numbers in parentheses indicate increases or decreases in comparison with the previous year.  
 • Due to rounding, figures in columns may not add up to the totals shown.

• Items shown as "0.0" include items for which the value was smaller than the display units used.  
 • See pages 41 and 42 for details on the environmental performance index (environmental conservation benefits).

## Looking Back on FY 2010 Environmental Activities

All first year target were met for the Fujitsu Group Environmental Protection Program (Stage VI). Fujitsu is further enhancing its global environmental activities to be a leader in environmental management.

In FY 2010, we started the Fujitsu Group Environmental Protection Program (Stage VI), which consists of 18 items, and achieved all of the targets for the first year. The main results of these activities included expanding provision of Green ICT products, reducing greenhouse gas emissions, and starting the use of quantitative indicators to measure the influence and contribution of business activities on the new priority field of conserving biodiversity.

We also made progress in expanding our environmental management globally. For example, to strengthen development of environmentally friendly products, we drew up common criteria for environmentally friendly design based on global standards with Fujitsu Technology Solutions in Germany, which develops servers and PCs. Also, to advance standardization related to procedures to evaluate reductions in environmental burdens, we participated proactively in international standardization institutions such as the ICT for Energy Efficiency Forum and the International Telecommunication Union. As a result of these efforts, we received a wide range of honors and praise from our stakeholders during FY 2010.

We aim to be a future leading corporation in environmental management and will strengthen our global environmental activities still further.

First, we will become more rigorous about compliance with the law and are working to strengthen our global governance. We will also unflinchingly achieve the targets of the Fujitsu Group Environmental Protection Program (Stage VI), which are solemn undertakings to customers and to society. Furthermore, while developing environmental technologies that create new values for our customers and providing environmental solutions, we will deploy globally the leading-edge environmental technologies we have developed at data centers and other sites in Japan.



**Atsuhisa Takahashi**  
Corporate Executive Advisor  
(Environmental Strategy)

**Minoru Takeno**  
President, Corporate  
Environmental Strategy Unit

Our awareness of energy and our values have been changed by the Great East Japan Earthquake, which occurred in March 2011, and we realize that energy must be used throughout society even more efficiently than ever before. We in the Fujitsu Group have renewed our awareness of energy as both a critical management resource and a source of risk. We will work to save energy and reduce electricity usage by taking full advantage of the environmental management foundation we have developed so far and will continue to improve our energy efficiency in the future. Furthermore, we will work aggressively to develop products and services that save energy and result in even lower CO<sub>2</sub> emissions based on our current successes. Thus, we will contribute to our customers' business reforms and the building of a sustainable society.

## Stakeholder's Voice

### Expert Opinion

I recognize that the Fujitsu Group's environmental efforts are solid ones that Fujitsu has sustained steadily and reliably over many years while showing both visions and roadmaps. As a corporation positioned to reduce society's environmental burden by taking advantage of ICT, we have high hopes for Fujitsu's environmental activities through its main businesses. I give high marks for Fujitsu's carefully considered allocation of resources, importantly not just in the short term, but over the medium and long term too, including its investment in R&D for these purposes.

When it comes to ICT technologies, Fujitsu does give the impression of a "hard" approach. However, one of their strengths is that they are also capable of a "soft" approach, that is, a more humanistic approach that can speak to people's feelings or appeal to their emotions, such as a map that shows where and when the dandelions are starting to bloom across Japan.

I also came to understand that in the solutions area, Fujitsu handles matters that are less immediately obvious than hardware. This area is not about just improving or replacing hardware but involves a wide range of trial-and-error and practical experience to create proposals at a new level intimately related to the general way we work and live.

I believe that Fujitsu, in its efforts to become a top corporation in environmental management, is making solid progress in most areas where society commonly has expectations of corporations and I

firmly believe that Fujitsu will move forward to even more "aggressive" environmental activities.

While Fujitsu has put efforts into saving energy and reducing CO<sub>2</sub> emissions, I hope that they will, in the future, contribute to the creation of a society in which both the current and future generations can live happily without excessively burdening the Earth's environment based on a broader understanding of sustainability rather than a mere preoccupation with the environment.

Furthermore, if that happens, the important issue to address in broadening and deepening activities will be more "How can we move forward?" rather than "What should we do?" I hope that Fujitsu will provide its employees with increasing opportunities to acquire the habit of dialogue and collaboration with a wide variety of stakeholders to whom they have not hitherto been so strongly linked, including NGOs, local communities, students, and children.

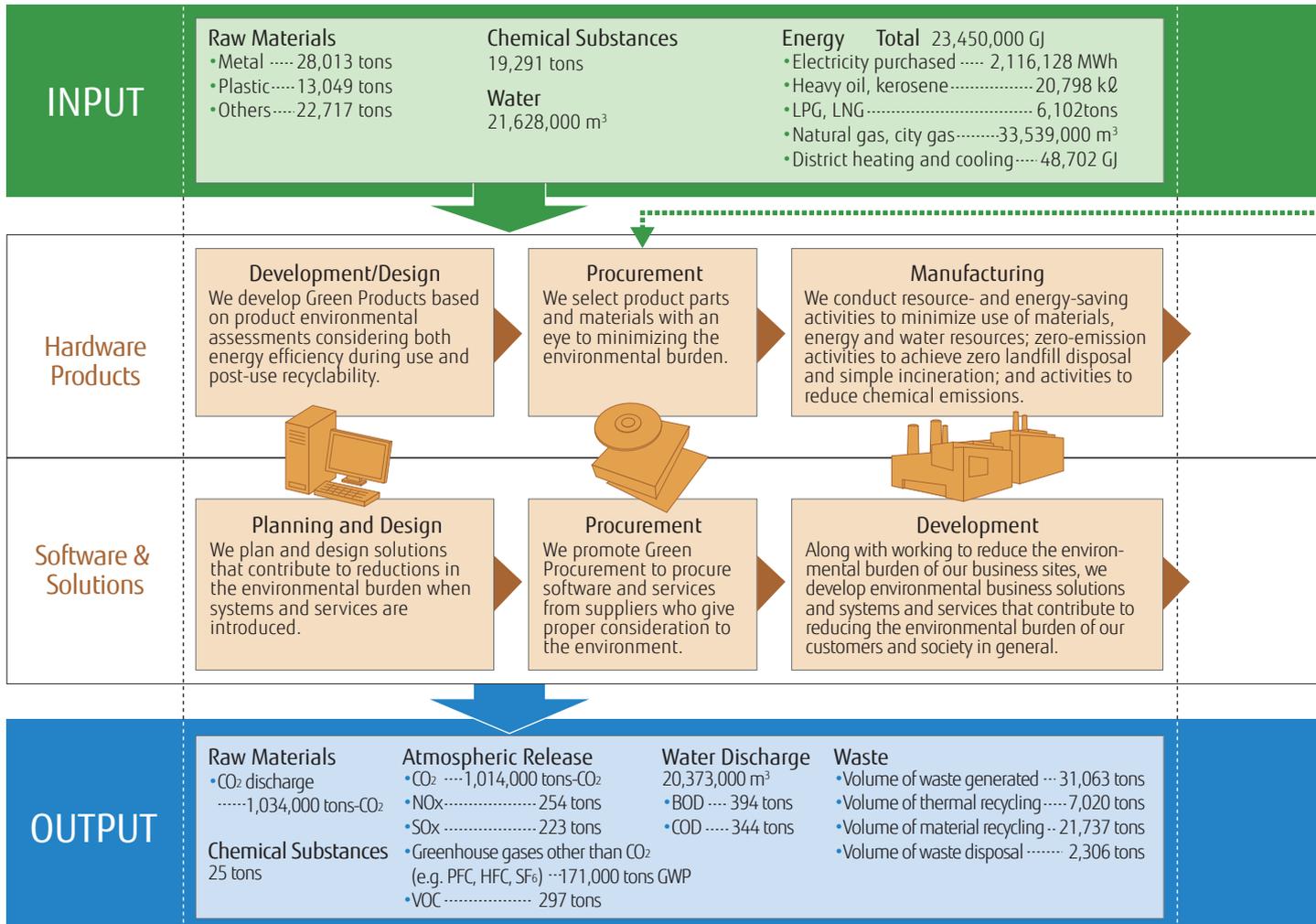


**Junko Edahiro**  
Representative  
of e's Inc.,  
Representative of  
the Japan for  
Sustainability NGO

# Operating Activities and Environmental Burden (Material Balance)

We promote environmentally friendly business activities through overall quantitative assessment of our environmental burden from the life cycle and supply chain standpoints.

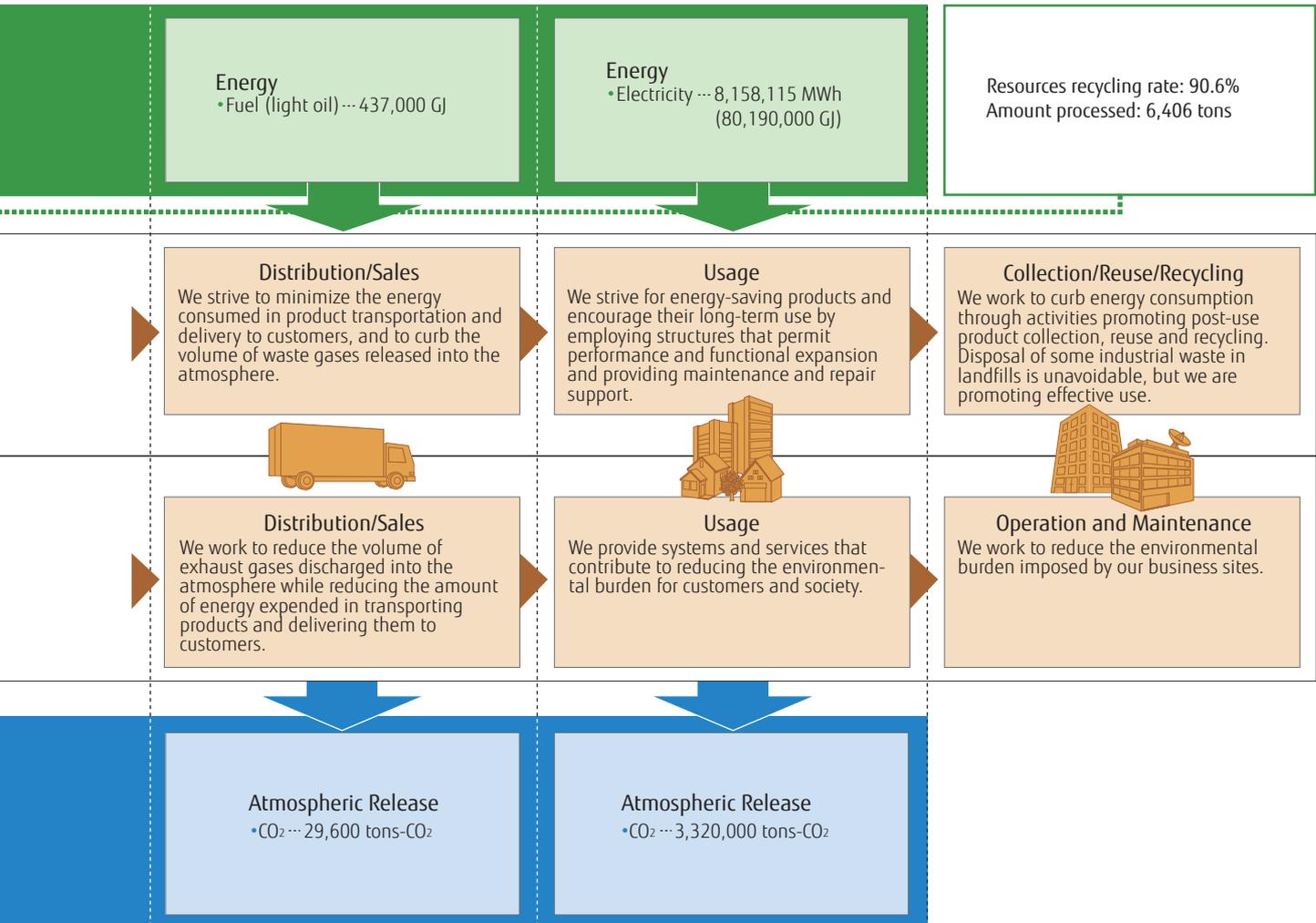
## Material Balance



## Calculation Methods

INPUT		
Development / Planning & Design	Raw Materials	Material inputs to our major products* shipped in FY 2010 (raw materials per unit for each product times the number of units shipped in FY 2010)
	Chemical Substances	Volume of PRTR Law target chemicals handled by plants/sites in FY 2010
Procurement	Water	Volume used by plants/sites in FY 2010
	Energy	Electricity, oil and gas consumed by plants/sites in FY 2010
Distribution / Sales	Energy	Energy consumption in transportation in FY 2010
Usage	Energy	Electricity consumption by major products* shipped in FY 2010 (Assumed hours of use per product x age-based electricity consumption x the number of units shipped in FY 2010)
Collection/Reuse/Recycling		The weight ratio of recycled parts and resources with respect to the processing volume of post-use products is calculated according to the method of the Japan Electronics and Information Technology Industries Association. It excludes collected waste other than post-use electronic products.

\* Major products: Personal computers, mobile phones, servers, workstations, storage systems, printers, scanners, financial terminals, retail terminals, routers, LAN access equipment, access network products, mobile phone base stations, and electronic devices.



**Calculation Methods**

OUTPUT		
Development / Planning & Design Procurement Manufacturing / Development	Raw Materials	Material inputs to our major products* shipped in FY 2010 (per-unit volume of CO <sub>2</sub> emitted from mining the resource until it becomes a raw material for each product times the number of units shipped in FY 2010) In FY 2010, we improved our grasp of the number of electronic devices used in our products with very high accuracy.
	Chemical Substances	Measuring the concentrations of PRTR Law target chemicals discharged through plants' drains and exhaust ports in FY 2010 and multiplying the total volume discharged (nickel compounds, manganese compounds, etc.) or total volume emitted (xylene, toluene, etc.), or calculating based on the chemical substance balance (xylene and toluene).
	Atmospheric Release	CO <sub>2</sub> : CO <sub>2</sub> discharge volume associated with energy consumption by plants/sites in FY 2010 (Energy consumption times CO <sub>2</sub> conversion factor) NO <sub>x</sub> , SO <sub>x</sub> : Calculated from concentrations in gases discharged from vents (boilers, etc.) by plants/offices in FY 2010 Greenhouse gases other than CO <sub>2</sub> : Discharge volume of process gases used in four semiconductor plants in FY 2010. (Calculated by formulas such as <volume of gas used> x <ratio consumed in reactions> x <detoxification ratio>) VOC: Emission amounts of the substances subject to emissions restrictions stipulated by the four electric and electronics associations for factories and business sites for FY 2010
	Water Discharge	Wastewater volume discharged by plants/sites into sewerage or rivers in FY 2010 BOD: A measure of the emission volume of organic pollution of water discharged by businesses employing the volume of oxygen consumed when organic matter in water is removed by microbial activity. COD: A measure of the emission volume of organic pollution of water discharged by businesses employing the volume of oxygen consumed when organic matter in water is removed chemically by oxidation.
	Waste	Quantity of Waste Generated: amount of waste generated by plants/sites in FY 2010 Volume of Waste Disposal: The volume of landfill disposal and simple incineration by plants/sites in FY 2010 (including waste which is not a zero emission target)
Distribution / Sales	Atmospheric Release	The total volume of CO <sub>2</sub> emissions in FY 2010, including both fuel consumption by our shipping business in Japan when measurable, and shipping distance x freight weight x coefficient when the freight of companies other than Fujitsu is included, as in mixed load transportation
Usage	Atmospheric Release	The volume of CO <sub>2</sub> emissions during use of major products* shipped in FY 2010 (Amount of energy consumed x CO <sub>2</sub> conversion coefficient. The amount of energy consumed is calculated by multiplying the quantity of electricity used during the estimated time of use of each product unit by the number of units shipped in FY 2010)

\* Major products: Personal computers, mobile phones, servers, workstations, storage systems, printers, scanners, financial terminals, retail terminals, routers, LAN access equipment, access network products, mobile phone base stations, and electronic devices.

# Leading-Edge Green ICT Research and Development

We are concerned with reducing environmental burdens at the policy and proposal stages in our leading-edge research and development and we are continuously creating technologies that contribute to saving electricity and using next-generation sources of energy.

## Basic Approach

### Promote the Development of Products and Services that are Optimized to Benefit Lower Environmental Burdens

To achieve the goal of reducing CO<sub>2</sub> emissions by about 30 million tons a year in Japan by 2020, as proposed in Green Policy 2020, our medium-term environmental vision, we need to develop revolutionary leading-edge technologies that have even greater environmental burden-lowering effects than at present.

Fujitsu Laboratories Ltd., which handles the Fujitsu Group's leading-edge green ICT R&D, has introduced the slogan "Strengthen leading-edge green ICT R&D and contribute even more to Fujitsu Group business" and is pushing forward with R&D on technologies that can benefit lower environmental burdens. Based on the concept of Green R&D, we are establishing and implementing policies from an environmental standpoint in all development work, from materials and devices through facilities, to systems and solutions.

## Efforts in FY 2010

### Quantitatively Evaluating CO<sub>2</sub> Emissions Reduction Benefits from the R&D Stage

To accelerate our environmentally oriented R&D, in April 2010 we started efforts to evaluate quantitatively the benefits in reduced CO<sub>2</sub> emissions (i.e., the environmental contribution) to be expected from the products and services that would include leading-edge technology while we were still in the R&D phase of developing that technology. These efforts are implemented across all units in the laboratories, and since researchers can evaluate the technologies they are responsible for (see figure), we can clarify the main advantages of the technologies from an environmental standpoint. Furthermore, by adding "the environment" to the axes of performance/functionality/quality and cost, R&D on leading-edge technologies that is balanced across all three of these axes becomes possible.

The Fujitsu Group Environmental Protection Program (Stage VI) sets up "Strengthening leading-edge green ICT R&D" as a priority and divides this into two areas with specific targets: the area of

next-generation data centers and networks and the area of solutions.

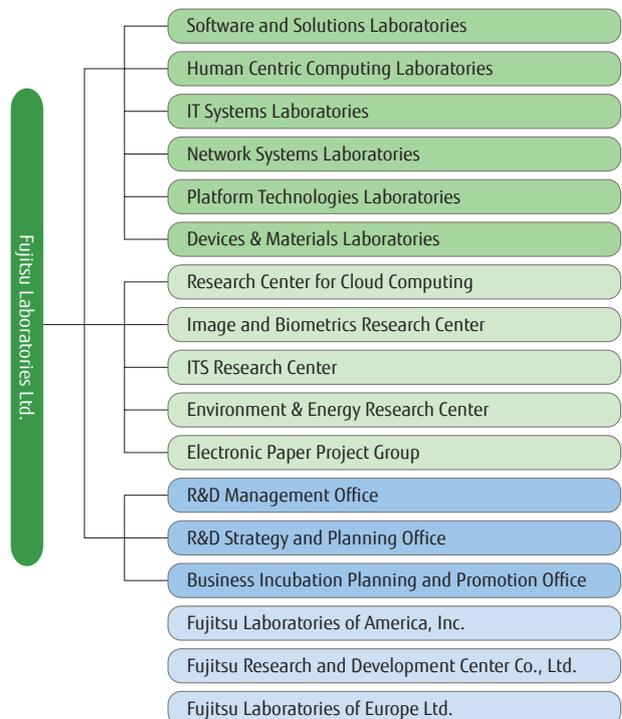
The target for the next-generation data center and network area is developing technologies that can double the overall efficiency of ICT equipment by the end of FY 2012. The target for the solutions area, also by the end of FY 2012, is to increase by at least 35% the development ratio for technologies that improve the effective reduction of environmental burdens.

In FY 2010, we did not just clear the target of developing technologies that can increase ICT equipment efficiency by of 1.2 times, we improved it to 1.3 times. Then again, in the solutions area, we were able to achieve a development ratio of 58% for technologies that improve the effective reduction of environmental burdens rather than the minimum 25% of the fiscal year target. Based on these results, we revised the solutions area development ratio target to at least 70% by the end of FY 2012.

Fujitsu Laboratories Inc. will, while further increasing the environmental contribution of our leading-edge technologies, aim to expand the applications areas to complete systems including those in which the individual technologies work together.

**WEB** Press Release:  
<http://www.fujitsu.com/global/news/pr/archives/month/2010/20100329-02.html>

### Organization of Fujitsu Laboratories Ltd. (As of March 2011)



### Basic Approach to Research and Development

- Promoting the development of revolutionary leading-edge technologies with green ICT as a priority area.
  - Rendering visible the low-carbon benefits across the whole value chain
  - Low-carbon technologies for ubiquitous equipment
  - Energy-saving technologies for data centers and networks
  - Environmental solution technologies
- Exhibiting synergy between total technology development and open innovation
  - Consolidation of elemental technologies from materials and devices to solutions
  - Global technology coordination

### R&D Example 1 Optical Switch that Cuts Power Consumption by Half

In November 2010, Fujitsu succeeded in developing technology that reduces the power consumed by optical switches to one-half of previous levels.

An optical switch is a unit that can switch the optical signal path without conversion in a communication network. Previously, progress had been made in developing next-generation networks with low power consumption using optical switches, since the power consumption of converting from optical to electrical signals is high.

In the structure used in this switch, instead of the earlier fine-patterned silicon, Fujitsu used, for the first time, fine-patterned silicon-germanium and achieved a reduction in power consumption to half that of earlier switches.

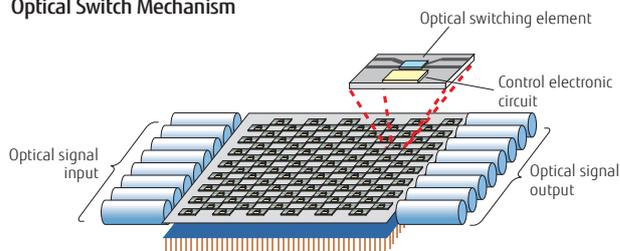
With the volume of data transmitted over networks increasing every year, power consumption in network equipment is increasing in step and there is concern that this could become a serious energy issue in the future. Next-generation large-capacity network communications applications such as cloud computing and ultrahigh-definition video distribution can be supported by using this technology to reduce power

consumption. Note that since this optical switch uses commonly available silicon fabrication technology, its price can be reduced through mass production.

Fujitsu will continue to strive to achieve large-scale optical switches that can implement next-generation networks.

**WEB** Press Release: <http://www.fujitsu.com/global/news/pr/archives/month/2010/20101109-02.html>

#### Optical Switch Mechanism



### R&D Example 2 Hybrid Energy Harvesting Device for Generating Electricity from Heat and Light Developed

In December 2010, Fujitsu developed a power generating device with a new hybrid structure that can extract power from both heat and light.

Previously, to use both heat and light as energy sources for generating electricity it was necessary to provide two separate devices: a thermoelectric element for generating electricity from heat and a photovoltaic cell for generating electricity from light. There was also the problem that combining multiple elements increased device costs.

For this newly developed hybrid energy harvesting device, Fujitsu developed a new organic material that can generate electricity from both heat and light and created a device that can generate electricity from both thermal and optical environments. Previously, there had been cases where in one of these environments it would have been impossible to harvest adequate energy. This new hybrid device, however, makes it possible to provide a larger amount of energy by selecting the more favorable environment and switching to that mode of generation. Furthermore, since the material used is relatively inexpensive, manufacturing costs can be held to a minimum. Since neither power from a generating station nor batteries are used, it is not necessary to use electrical wiring or change batteries.

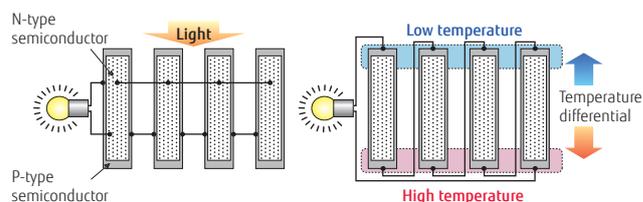
We hope that this technology can be used in the energy harvesting area, in which energy is collected from the surrounding environment

in the form of light, vibration, heat, or radio waves and converted to electricity. Although energy harvesting is seen as a next-generation energy source, since a given mode of energy, say light or vibration, is not always present, there is demand for the ability to switch appropriately to an energy source that does exist in the surrounding area and generate electricity efficiently.

We are aiming for practical application of this device around 2015 as one that can respond to next-generation needs and are working to increase performance and develop mass-production technologies.

**WEB** Press Release: <http://www.fujitsu.com/global/news/pr/archives/month/2010/20101209-01.html>

#### Hybrid Generating Device



### R&D Example 3 Developing a Wide-Area Traffic Simulator that Can Provide a Virtual Driving Experience

Smooth traffic flow is a critical issue for preventing traffic jams and accidents and reducing the associated CO<sub>2</sub> emissions. Given this background, to achieve future traffic patterns in which traffic jams can be avoided, in December 2010 we developed a wide-area traffic simulator that also allows drivers to experience the simulation.

At the same time as reproducing, in real time, the behavior of tens of thousands of vehicles on roads covering a wide area, this simulator also generates visual images for drivers and allows one of those vehicles to be driven virtually.

As an example of traffic policies that make use of this technology, we simulated a service that notifies drivers of the recommended speed that will allow them to pass through traffic signals without accelerating or decelerating. As a result of evaluation, we learned that the ease of driving and the CO<sub>2</sub> reduction effect change with the way drivers are notified and with the timing of such notifications. In addition to allowing the *a priori* evaluation of a variety of measures for smooth traffic flow, it also allows benefits and problems to be evaluated from the actual viewpoint of drivers. This will make it possible to implement appropriate measures that match the road conditions.

In addition to moving forward with practical implementation of this service, we will work to expand the simulation to an even wider area, expand the service, and aim at applying this system to verification of traffic policies over a wide area.

**WEB** Press Release: <http://www.fujitsu.com/global/news/pr/archives/month/2010/20101206-01.html>



Driving experience simulator

# Eco-Friendly Products

We are accelerating the development of Green Products and Super Green Products and are working to reduce environmental burdens throughout the product life cycle.

## Green and Super Green Product Development

The Fujitsu Group has adopted a unified Group-wide approach to eco-design for newly designed products and works to improve environmental performance throughout the product life cycle. We have been implementing our own environmental assessments for products since 1993, and we strive to develop eco-friendly products that reflect environmental considerations in such areas as energy saving, 3R design\*, non-use of hazardous chemical substances, packaging materials, and information disclosure.

Moreover, in 1998, to further strengthen development of eco-friendly products, we established Green Product Evaluation Standards and positioned the products that satisfy them as Green Products. Then, in FY 2004, we combined what had previously been two separate sets of regulations – for product environmental assessment and for Green Product evaluation – into a single set of standards with even higher levels of consideration for the environment. We called these Product Environmental Green Assessment Regulations, and they have helped to both strengthen our Green Product development efforts and make them more efficient.

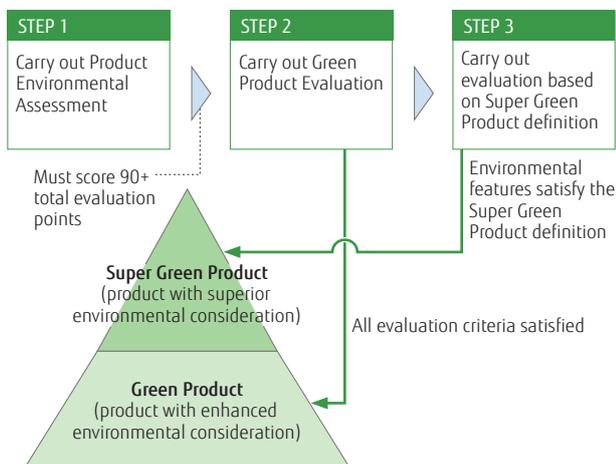
Furthermore, since FY 2004, we have been working on what we call "Super Green Product" development for newly developed products. Super Green Products are those that meet the required conditions for Green Products and are also top class in terms of low energy consumption and/or 3R design technology, non-use of hazardous substances, packaging materials and use of eco-friendly materials and technologies. Super Green Products are products or systems recognized as having superior environmental characteristics to others we supply or are available on the market.

Starting in FY 2010, the definition of Super Green Product has been revised to be the more strict "being in the top level in both energy saving and some other parameter (such as resource saving)."

In FY 2010, another 19 products were recognized as being Super Green Products.

\* 3R design: Design based on the principles of reduce, reuse and recycle

### Mechanism for Green and Super Green Product Evaluation



## The Green Policy Innovation Logo

The Fujitsu Group green IT project "Green Policy Innovation" logo is affixed to Green Products and Super Green Products.

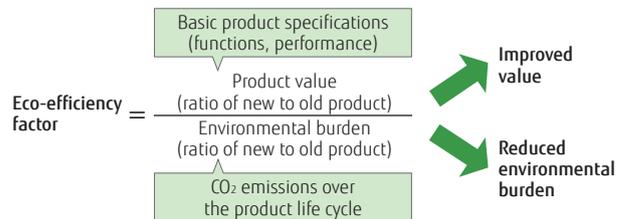


## Improving the Eco-Efficiency Factor

We introduced the eco-efficiency factor\*, which evaluates both the environmental burden reductions and the product value increases at the same time for newly developed Green Products in the Fujitsu Group Environmental Protection Program (Stage V) in FY 2007. In the Fujitsu Group Environmental Protection Program (Stage VI), we changed the base fiscal year for products from FY 2005 to FY 2008 and are continuing these activities.

In FY 2010, which is the first year of the Fujitsu Group Environmental Protection Program (Stage VI), we achieved a factor of 3.2 in comparison with our target of 1.5, significantly exceeding the target. The main factors were improvements in data-processing power and energy efficiency in network products and PC servers. Since we have already achieved the FY 2012 target of 2.5, we revised that target upwards for even further improvement.

\* Eco-efficiency factor: A method for comparing old and new products that quantitatively grasps improvements in both product environmental burden and value (functionality and performance). This is an environmental index that promotes the creation of products that can provide even higher values with even lower environmental burden.



## Application to Global Environmentally Friendly Standard Products

In May 2011, we established an internal standard, the Eco Design Standard, that conforms to the IEC 62075\*1 international standard and strives to meet the environmental requirements of the market\*2.

Fujitsu PCs and servers are designed in both Japan and Europe and are provided globally. We are moving forward globally with product environmental friendliness with this round of standards unification.

\*1 IEC 62075 international standard: A product life cycle environmental design standard for video, audio, information, and communications equipment. This standard was published in January 2008 and established as JIS C 9914 in July 2010 in Japan.

\*2 Covered equipment: PCs, servers, and storage systems.

## Super Green Product Development Examples

### SPARC Enterprise M3000 UNIX Server



- Energy savings**  
Conforms to the standards of the Japanese 2011 Energy Conservation Law and reduces maximum power consumption by 53% compared to earlier products.
- 3R design technology**  
Weight reduced by 51% and volume reduced by 52% compared to earlier products.

### PRIMEQUEST 1400S2 Mission-Critical IA Server



- Energy savings**  
Conforms to the standards of the Japanese 2011 Energy Conservation Law and reduces operating power consumption by 70% compared to earlier products. Uses the 80Plus Gold power supply.
- 3R design technology**  
Weight reduced by 82% and volume reduced by 91%.

### IPCOM EX2500 Series Network Server



- Energy savings**  
Reduces power consumption by 78% per unit performance, achieves an eco-efficiency factor of 7.49 and an environmental burden of 0.37.
- 3R design technology**  
Weight reduced by 41% and volume reduced by 53%.

### ESPRIMO D570/B Desktop PC



- Energy savings**  
Reduces operating power consumption by 20% or more compared to earlier products and by 50% or more compared to the international Energy Star guidelines. Provides a power outlet linked to the on/off state of the display power supply.
- 3R design technology**  
Four or fewer types of plastic used in the chassis.
- Chemicals**  
Halogen-free materials used for the chassis plastics.

### ScanSnap S1100 Color Image Scanner



- Energy savings**  
Reduces sleep mode power consumption by 77.6% compared to the international Energy Star guidelines, reduces operating power consumption by 44.4% compared to earlier products, and reduces standby mode power consumption by 64.2% (compared to DC power operation).
- 3R design technology**  
Achieves the world's lowest class in chassis volume, a weight reduction of 78.0% compared to earlier products, and volume and parts counts reductions of 79.6% and 24.6%, respectively.
- Chemicals**  
Using LED light sources (eliminating mercury additives)

### SR-S316TL1 Secure Switch



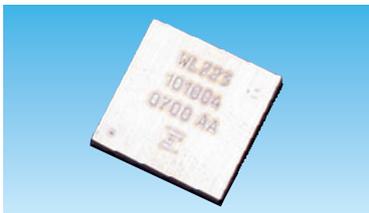
- Energy savings**  
Achieves an efficiency that is 300% of the energy consumption efficiency target standard and reduces power consumption by 87% compared to earlier products.
- 3R design technology**  
Weight reduced by 80% and volume by 82.5% compared to earlier products.
- Chemicals**  
Lead-free solder is used in all printed circuit boards.

### SG-2110 Palm Vein Recognition Unit Room Access Control System



- Energy savings**  
Operating power per unit performance reduced by half for faster recognition.
- Chemicals**  
Weight reduced by 30% or more and volume by 10% or more compared to earlier products.

### MBH7WLZ23 Wireless LAN Module



- Energy savings**  
Standby mode power reduced by 41% compared to competing products.
- 3R design technology**  
Achieves the top level of miniaturization in its field.
- Chemicals**  
Halogen-free materials used for printed circuit boards.

### FTR-K3L Power Relay



- Energy savings**  
Achieves a standby mode power consumption of 0 W in a self-maintaining relay.
- Chemicals**  
Lead-free solder used and contains no materials covered by REACH regulations.

## Eco-Friendly Products

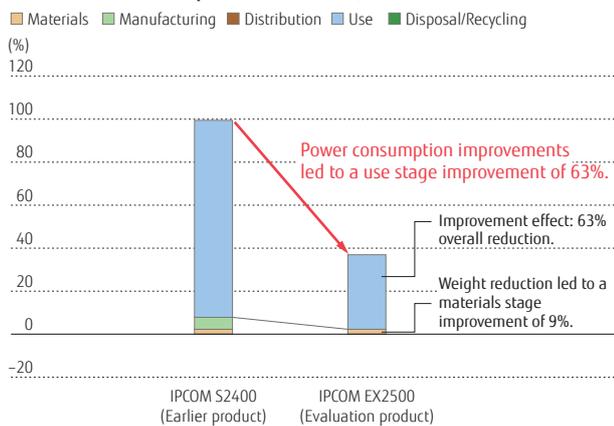
### Carrying Out Life Cycle Assessment (LCA)

The Fujitsu Group has made it obligatory to perform LCAs for all its Green Products. Calculation standards have been formulated for each product family, and the Group efficiently evaluates the environmental burdens of its products using its own database\*.

Performing LCAs makes it possible to determine which parts of a product's life cycle account for the greatest proportion of the environmental burden, so that environmentally friendly products (see page 45) can be designed effectively. We also apply the expertise developed through our LCA activities to calculate the eco-efficiency factor, and are actively using this as a tool for communicating with our customers.

\* **Our Own Database:** This is our own unique database of unit values, created by Fujitsu Laboratories based on input-output tables.

#### IPCOM EX2500 LCA Improvement Effects (CO<sub>2</sub> emission)



### Environmental Labeling and Information Disclosure

We actively disclose environmental information on our products, both via the Internet and in the form of environmental labels.

Since the end of FY 2006, we have registered notebook personal computers under the EPEAT\*1 system, which encourages the purchase of green PCs and is used chiefly by US government bodies. Product environmental information for computers, magnetic disk devices, displays, printers, scanners, and mobile phones covered by green purchasing laws\*2 is published on the Ministry of the Environment's website\*3, while the equivalent information for computers, displays, printers and scanners conforming to the ENERGY STAR Program in Japan is published on the website of the Energy Conservation Center, Japan\*4.

\*1 EPEAT website: <http://www.epeat.net/>

\*2 Green purchasing laws: Laws related to promoting the purchase of eco-friendly goods and products by the country or other parties.

\*3 Ministry of the Environment's website: <http://www.env.go.jp/en/laws/policy/green/index.html>

\*4 Energy Conservation Center, Japan website: [http://eccj06.eccj.or.jp/cgi-bin/enestar/pub\\_productsE.php](http://eccj06.eccj.or.jp/cgi-bin/enestar/pub_productsE.php)

#### Environmental Efforts Example 1

##### Efforts to Making Networks Greener

It is estimated that, due to increases in network traffic, power consumption in network equipment in Japan will be 13 times larger in 2025 than it was in 2006. Thus rapid increase in power consumption in this equipment is an issue of concern.

To reduce our customers' environmental burden through saving energy in network products, we have been working to develop energy-saving technologies from five standpoints: (1) devices, (2) systems, (3) whole networks, (4) network construction and operation, and (5) solutions that use networks. We develop, for example, access transport systems and optical expansion wireless units as products that incorporate a wide range of energy-saving technologies. At the same time as saving our customers significant amounts in operating and maintenance costs, these products contribute to making the whole network "greener."

##### Access Transport System Flashwave 2440 Series



\* **Energy savings:** Complies with the FY 2011 standards in the Japanese Energy Conservation Law. Power consumption is reduced by 64% compared to earlier products.

\* **3R design technology:** Weight was reduced by 62% and volume by 66% compared to earlier products.

#### Environmental Efforts Example 2

##### Developing and Providing Software that Saves Energy During ICT Operation

Energy-saving effects during operation can be obtained in ICT equipment such as servers, storage units, and networks by combining effectively with appropriate software.

For example, we supply a variety of software that reduces power consumption, including software to manage the state of energy-saving settings on PCs for the office\*1, software to automate power on/off, business operation, backup, and power supply control in servers for the data center\*2, and software to monitor whether the power is turned off in servers not in the operating state and to keep the number of powered on servers to an absolute minimum\*3. In, for example, software to build private cloud environments\*4, we contribute to energy saving by unified management of integration, operation, and monitoring networks, servers, storage and other systems and increasing the efficiency of resource utilization.

We are also working on developing software that achieves further environmental burden reductions by using the above-mentioned software to achieve energy savings.



Cloud infrastructure management software monitoring screen for server temperature and power monitoring

\*1 Using Systemwalker Desktop Patrol V14g

\*2 Using Systemwalker Runbook Automation

\*3 Using Systemwalker Centric Manager

\*4 For example, cloud infrastructure management software, ServerView Resource Orchestrator, and ETERNUS SF.

# Reducing Chemical Substances in Products

We cooperate with our business partners in striving for strict management of chemical substances whose use is restricted by laws and regulations in Japan and overseas, as well as of other potentially harmful substances.

## Management of Restricted Chemical Substances in Products

The Fujitsu Group designates substances that are harmful to people and the environment and whose use is either prohibited or regulated by law as “Fujitsu Group Specified Banned Substances.” We provide products that do not contain such substances by strictly prohibiting their use in our products and by working to eliminate them through our green procurement programs.

We also recognize that minimizing the risks posed by certain chemicals is of the highest priority in ensuring our customers’ safety. For this purpose, we designate substances suspected of being harmful (Substances of Concern) as “Fujitsu Group Specified Controlled Substances,” or “Fujitsu Group Specified Reportable Substances,” and, based on principle of prevention, we manage the amounts included so that we can transition to forbidding their use in stages as the danger of these specified substances becomes clear.

This effort is not limited to Japan but also applies to global regulations on chemical substances included in products.

## Management of Chemical Substances Restricted or Banned by Law

The Fujitsu Group defines legally regulated substances as “Fujitsu Group Specified Banned Substances,” and provides products that do not contain them.

We have also established Fujitsu Group Green Procurement Direction (see page 61) and strengthen control of the chemicals in our products by requiring our suppliers to construct chemical management systems (CMSs).

In response to regulations such as the RoHS Directive\*, we have taken systematic action covering the entire supply chain by constructing a system headed by our product business division and including our quality assurance, purchasing, and environmental divisions, to manage chemical substances from design through to delivery.

\* **RoHS Directive:** Restriction of the use of certain hazardous substances in electrical and electric equipment

## Controlling Substances of Concern

The Fujitsu Group Specified Reportable Substances list includes substances that are REACH regulation\*1 candidate substances\*2, and we collect information on substance amounts from suppliers and then manage these quantities on a per-product basis. Moreover, the Specified Controlled Substances list also includes data from suppliers on amounts for substances that may not be restricted by every country’s regulations, but which we consider to be of concern.

As far as PVC is concerned, we not only control the amounts included in our products but also require in our Green Procurement Direction that it be used as little as possible, and restrict its use in everything except sheathing for cables and insulating materials for electronic components.

\*1 **REACH regulation:** Regulation concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals

\*2 **REACH candidate substances:** Selected chemical substances with properties (carcinogenicity, mutagenicity, reproductive toxicity, etc.) regulated by REACH. If these substances are present in products, data on the amounts must be displayed.

## Contributing to Creating Mechanisms for Chemical Substance Management

In the Fujitsu Group, we see efforts towards chemical substance management as an issue for the whole supply chain and so we participate in activities such as the Joint Article Management Promotion-consortium (JAMP) and the Japan Green Procurement Survey Standardization Initiative (JGPSSI) industry groups and are studying how to configure a means of transmitting information efficiently.

Among these industry groups, we have been an active member of JAMP since its foundation. We were involved from the planning stages with the input format and entry support tools for the AIS (article information sheet), which is an included chemical substance information transmission sheet, and also participated in creating guidelines for appropriate management of included chemical substances and in practical education for business partners to promote the use of AIS throughout the industry. Furthermore, we are in charge of activities promoting the use of the JAMP information distribution infrastructure (JAMP-IT), which supports information exchange requests from multiple companies to create an environment for the smooth transmission of information.

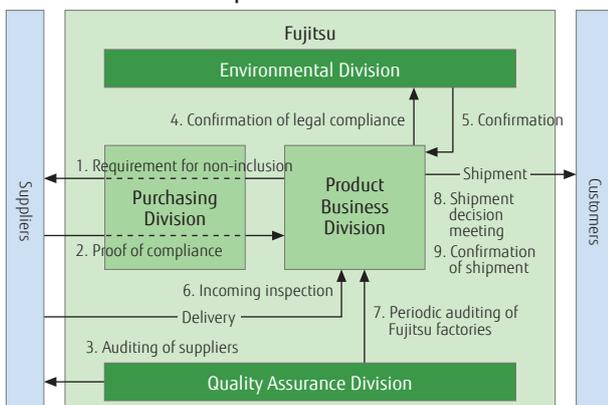
## Using ICT to Control the Chemicals in Our Products

From requesting surveys by outside organizations through to gathering information by our own efforts, the Fujitsu Group maintains an integrated system for managing the information on the chemicals contained in the components and materials it purchases from its suppliers throughout its supply chain. Further, we use the large volumes of chemical-related data we collect to calculate amounts on a per-product basis, pinpointing the amounts of restricted chemicals at the product level and managing them accordingly.

The Group also offers an environmental business solution called PLEMIA/ECODUCE, a software package that utilizes this in-house expertise.

**WEB** Management of the Restricted chemical substances in products: <http://www.fujitsu.com/global/about/environment/products/chemical/>  
The PLEMIA/ECODUCE website (in Japanese) <http://jp.fujitsu.com/solutions/plm/pdm/plemia/option-04.html>

Framework for RoHS Compliance



\* Fujitsu Group companies are also constructing their own frameworks based on the above.

# Promoting Product Recycling

We are advancing collection and recycling of end-of-life ICT products from a global perspective to help create a recycling-minded society.

## Basic Approach

### Recycling Activities that Conform to the Concept of Producer Responsibility

In accordance with the concept of Extended Producer Responsibility (EPR\*), under which the producer's responsibility for its products is not limited to the product design and manufacturing stages but extends to the disposal and recycling stages as well, the Fujitsu Group carries out recycling programs that comply with the waste disposal and recycling laws and regulations of the various countries in which it operates. We also try to do as much collection, reuse and recycling as we can even in countries where recycling is not obligatory, in line with the concept of Individual Producer Responsibility (IPR), which sees each producer as responsible for its own products.

IPR is a major challenge for the Fujitsu Group in expanding its business globally, but we believe that responding to this challenge and that of EPR in collaboration with industry associations and governments will enable us to help create a recycling-minded society in which the requirements and demands of all stakeholders are met.

\* EPR: Extended Producer Responsibility. The view that the manufacturer's responsibility lies not only in product design and manufacture but also extends to the disposal and recycling phases. This concept was made explicit in Japan's Fundamental Law for Establishing a Sound Material-Cycle Society enacted in June 2000.

## Promotion on a Global Scale

The Fujitsu Group recycles products in EMEA and the Americas (the United States, Canada, and Brazil) and Asia (Singapore, the Philippines, Australia, Hong Kong, Taiwan, and South Korea).

### Overseas Activities Example

EMEA: Fujitsu Technology Solutions (Holding) B.V. (FTS) Through its partner companies, Fujitsu Technology Solutions (Holding) B.V. (FTS) recycles waste ICT products for corporate and individual customers in 27 countries in the EU, as well as in Norway and Switzerland. In addition, since 1988 at Paderborn, the Group's own recycling center in Germany, we have been contributing to the reuse of waste resources by disassembling products by hand so we can precisely classify and then appropriately recycle the materials. In 2010 we processed 5,037 tons of waste ICT products and achieved a resource reuse rate of 96.3%.

To disseminate these activities widely, at CeBIT 2010, the world's largest ICT related trade show held in Germany, we both presented our recycling efforts and demonstrated PC



Visitor experiencing PC disassembly in the FTS environmental booth.

disassembling at our booth and were honored by a visit from Germany's environment minister.

Moreover, since 2008 Fujitsu Technology Solution's South Africa office has been collaborating with local waste-management companies to collect and recycle from corporate and individual customers all products of any brand, including monitors, printers, mobile phones, desktop PCs, notebook PCs, calculators, TVs, and DVD equipment. This is the first time an ICT company has provided such a service in South Africa.



Large recycling bin installed at a public site in South Africa

Also at other overseas sites we have linked up with local recycling partner companies and promoted the recycling of ICT products.

- Singapore: Fujitsu PC Asia Pacific Pte. Ltd. (FPCA) (Starting in 2007)
- Brazil: Fujitsu do Brazil Ltda. (FBR) (Starting in 2010)
- Australia: Fujitsu Australia Ltd. (FAL) (Starting in 2006)
- South Korea: Fujitsu Korea Ltd. (FKL) (Starting in 2003)

## Promotion in Japan

As an enterprise with official designation for wide-area industrial waste disposal in Japan, Fujitsu engages in various kinds of contracts for accepting industrial waste for appropriate processing. We have established Fujitsu recycling centers throughout Japan to create a nationwide recycling system. This system provides for rigorous traceability and security, and achieves a high resource reuse rate. By providing this safe and secure service, we are fully discharging our Extended Producer Responsibility (EPR).

### Fujitsu Recycling Centers Throughout Japan



## Achievements in Collecting and Recycling End-of-Life ICT Products

Although the volume of materials collected is declining due to progress in miniaturization and reduced product weights, we processed 6,406 tons of recycled ICT products from corporate customers in FY 2010, and achieved a resource reuse rate of 90.6%. Also, we have now collected a total of 74,231 end-of-life PCs from individual customers.

## Promoting Recycling

Experienced workers carefully disassemble collected products by hand and separate the materials into categories such as steel, copper, aluminum, precious metals, glass and 20 different types of plastic. They also strive to raise their manual disassembly standards through the use of animated disassembly manuals. Materials recognition equipment has been introduced for plastics that are difficult to discriminate, so as to allow the complete segregation of different types of plastic. In addition to minimizing the quantity of waste materials in this way, we are continually trying to turn them back into resources that can be reused to make products.

Also, to keep our customers informed of these initiatives, we distribute ballpoint pens and folders made from recycled plastic at exhibitions and other events, as well as demonstrating PCs being manually disassembled.



Plastic material identification equipment



Ballpoint pens and folders made from recycled plastic

## Providing Product Recycling Information

In order to properly dispose of end-of-life ICT products, since FY 2004 Fujitsu has been operating a digital management system for its product disassembly manual.

Through this system, Fujitsu recycling centers can download from our in-Group website as animated disassembly manuals all the information they need to recycle products. In addition to providing a downloadable products disassembly manual, the system provides instructions on how to deal with items containing restricted chemical substances and plastic materials, and with products that contain customer data.



Electronic Disassembly Manual Management System



Animated disassembly manuals

## Developing a Traceability System

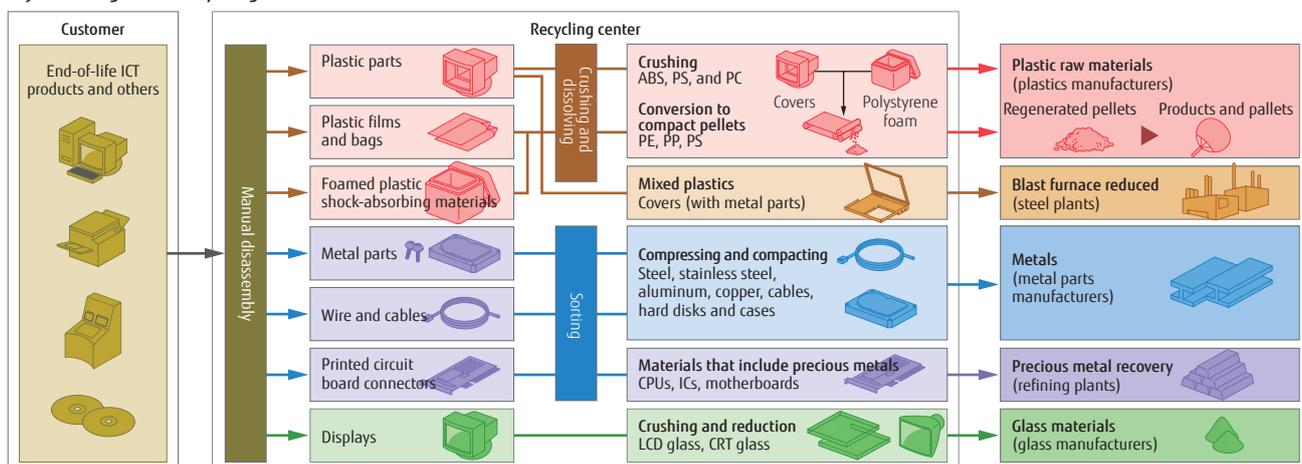
We developed an integrated recycling information management system and since FY 2007 have adopted it at the Fujitsu recycling centers. This system prevents theft and illegal dumping by attaching barcodes to customers' ICT products and managing data on the history of the recycling process from acceptance at the recycling center through disassembly and destruction of the hard disks on a per-customer basis.

## Targets and Achievements in Stage VI of the Environmental Protection Program

The target was to sustain 90% resource reuse rate\* of business ICT equipment globally at Fujitsu recycling centers, and in FY 2010 the achievement was 93.3% (90.6% within Japan and 96.3% overseas).

\* **Resource reuse rate:** The ratio of the amount (by weight) of recycled parts and resources to the amount of end-of-life business ICT products processed.

## Fujitsu Integrated Recycling Process



## Solutions that Benefit the Environment

We are working globally to provide solutions that reduce our customers' and society's environmental burdens through creating our own certification system for Environmentally Conscious Solutions.

### Basic Approach

#### The Vital Importance of Using ICT to Reduce CO<sub>2</sub>

To reduce the amount of greenhouse gas emissions worldwide, efforts will be needed to reduce power consumption and to develop the environmental technologies required and to radically reform the way people live and work. To achieve these innovations, ICT has an indispensable and ever increasing role to play in reducing environmental burdens. It will be critically important to take full advantage of such ICT in the future.

For example, CO<sub>2</sub> emissions can be reduced by Internet teleconferencing that reduces the transportation of people and things.

The Fujitsu Group sees ICT as the way to reduce environmental burdens (which we call "Green by ICT") and we are globally promoting the provision of leading-edge green ICT to reduce the burdens of society as a whole.

### Action Policy

#### Concern for the Environment in Every Aspect of the Solutions Business

We believe that we must actively promote the reduction of environmental burdens by using ICT to achieve the CO<sub>2</sub> reduction targets in our Green Policy Innovation initiative.

Therefore, while we aim to increase still further the number of products and services that both solve business problems and reduce environmental burdens, as we were already doing, in FY 2010 we aimed to emphasize the quantitative reduction of burdens our proposals will achieve and give examples of their effectiveness when adopted. We also took the environment into consideration in all the business processes involved in providing solutions.

### Efforts in FY 2010

#### Increasing the Certification of Environmentally Conscious Solutions

Ever since FY 2004, we have assessed the quantitative reduction in environmental burdens (in terms of reduced CO<sub>2</sub> emissions) achieved when our solutions are adopted, and we certify products and services that exceed the required standard as Environmentally Conscious Solutions. In FY 2010, we certified 33 new items, bringing the total to 230. While increasing the number of these certified products and services, we aim to indicate the CO<sub>2</sub> reduction ratio for all our solutions.

### Global Efforts

To proactively offer solutions that reduce environmental burdens in Europe and the Asia/Pacific region, we started full-scale overseas operation of our certification system for Environmentally Conscious Solutions in FY 2010. This was when we shared the evaluation procedures used in Japan for Environmentally Conscious Solutions and examples of their application with the heads of our key overseas centers and established the certification system. We are aiming at 100% coverage of divisions and regions\*, which is a target of our Environmental Protection Program (Stage VI) by FY 2012.

\* 100% coverage of divisions and regions: Refers to implementing environmentally conscious solutions in five divisions (industry, transportation, business, home, and energy) and four regions (Japan, Europe, USA, and Asia/Pacific).

### Making CO<sub>2</sub> Reductions by ICT Visible

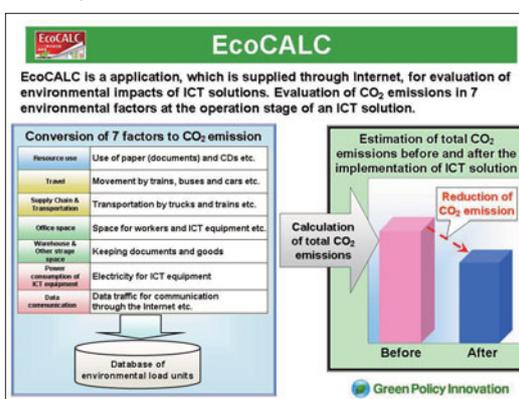
In FY 2010 we introduced mechanisms for our sales and SE staff to quickly calculate the effect of environmental burden reduction by ICT for customers who adopt it and to present that effect clearly to the customer.

First, we created a proposal template that shows the standard CO<sub>2</sub> reduction amount for Fujitsu Group products and solutions and deployed this within the Company. Next, we developed an environmental contribution calculation web tool and started using it within Fujitsu in October 2010. This tool uses a procedure developed by Fujitsu Laboratories Ltd. for quantitatively assessing the effect of environmental burden reduction (in terms of reduced CO<sub>2</sub> emissions) when Environmentally Conscious Solutions are certified. This tool makes it easy for sales staff to calculate the amount of CO<sub>2</sub> reduced by ICT when customers adopt it.

Furthermore, to increase the use of these proposal templates and the environmental contribution calculation web tool by sales and SE staff, we held briefing sessions on effective ways to use them and gave in-house awards for proposals that incorporated CO<sub>2</sub> reduction amounts and reduction ratios. As a result, we were able to achieve CO<sub>2</sub> reductions by ICT adoption in many business cases over a wide range of business types, including manufacturing, distribution, banking, and health care. We are using these examples of CO<sub>2</sub> reduction as reference material when customers are considering the reduction in environmental burden that they will achieve by adopting ICT.

In FY 2011, we named this environmental contribution calculation web tool EcoCALC. As we continue to improve its ease of use, we will expand its target usage from within the group to our business partners. Additionally, we will disseminate and share superlative examples of CO<sub>2</sub> reduction by adopting ICT both within and outside Fujitsu to expand the area in which we promote ICT to reduce environmental burdens.

### EcoCALC, which calculates CO<sub>2</sub> emissions reduction effects



The EcoCALC screen

Adoption Example **Shizuoka Telecasting Co., Ltd.**

**Updating the Platform for the TV station's Core System for Editing, Sales, and Broadcasting and Reducing Power Consumption by Half**

Strengthening their ICT foundations became a critical issue for TV stations in handling new services such as terrestrial digital broadcasting and 1seg (One Seg) broadcasting, and in supporting the July 2011 transition to fully digital broadcasting, Shizuoka Telecasting, which broadcasts to Shizuoka Prefecture, upgraded their platform for editing, sales, and broadcasting in November 2010. This editing, sales, and broadcasting system is the core system that handles TV station business operations, from creating TV program schedules and time management for programs and commercials to issuing bills.

In updating their system, Shizuoka Telecasting adopted leading-edge platforms including a Fujitsu SPARC Enterprise UNIX server. At the same time as implementing an ICT foundation that provides the high quality and reliability required in the core system, we added functionality such as fault prediction and detection to allow business operations to continue even if a natural disaster or fault occurs. Also, Fujitsu's SupportDesk Standard maintenance and operations service makes 365-day/24-hour stable operation possible. While we optimized it with a view towards future upgrades of the whole system, we also reduced ICT operating costs.

When we proposed this platform update, we made use of our environmental contribution calculation web tool. We showed numerically that this update would provide large benefits in terms of reducing both power consumption and CO<sub>2</sub> emissions and made proposals that combined cost reduction and environmental benefits.

We expect that this upgrade can reduce CO<sub>2</sub> emissions by 51.6% compared with the previous system. This corresponds to an annual CO<sub>2</sub> reduction equivalent to that of about 950 cedar trees.

**Voice**

**Sakio Sato**

Director for Information Technology,  
Shizuoka Telecasting

We are grateful to Fujitsu for their proposals that dealt with functional aspects and provided cost reductions.

Until now, we had not really considered power consumption, but Fujitsu rendered visible the amount of CO<sub>2</sub> reductions and electricity savings, which were useful reference materials in deciding to adopt the system.



Adoption Example **The Hokuriku Bank, Ltd.**

**Achieving a 40% CO<sub>2</sub> Reduction by Updating the System that Handles the Bank's Daily Business**

As a regional bank representative of the Hokuriku area, the Hokuriku Bank provides community-based financial services. They upgraded their internal business system in February 2011. As one of their goals, in addition to increasing management efficiency and reducing operating costs, they also hoped to reduce their environmental burden. For this bank, increasing the environmental efficiency of systems used in daily business was an important issue because it proactively promotes environmental protection activities and aims at reducing their energy consumption by 1% per year and 5% over five years in accordance with the Japanese revised Energy Conservation Law, which came into effect in April 2010.

In upgrading their system, while concentrating the very large number of servers installed at the various banking offices in one business systems center, they adopted Fujitsu green products. Furthermore, they switched to a mechanism in which virtual desktops (including PC OS and application software) are provided on the servers in the business systems center and the staff access that software from their individual PCs. This created a system that can be used efficiently. As a result, the required ICT resources can be maintained while the number of physical servers, the power consumed and their cost, could be significantly reduced.

When we investigated the CO<sub>2</sub> reduction effect of the new system operated in this way, we found that it provides an effective reduction in CO<sub>2</sub> by about 119 tons per year, which corresponds to a 40% reduction.

**Voice**

**Akira Watanabe**

Construction and Design Team Head  
Management Control Division,  
The Hokuriku Bank, Ltd.

Our bank has already pushed forward with a variety of approaches to reduce our environmental burden, including the installation of solar panels, growing greenery on rooftops, and switching to LED lighting. As part of that effort we have been searching for a mechanism to reduce our environmental burden within the bank.

While the main aims of this system update were to increase efficiency and reduce costs, the effect of reducing environmental burdens was also one that we could not overlook. I hope that in the future we can review our air conditioning and other equipment and facilities.



# Providing Environmental Solutions

We provide solutions that support both implementing and improving environmental management so that our customers can achieve both their management strategies and reduced environmental burdens.

## Basic Approach

### Environmental Solutions that Support our Customers' Environmental Management

In the context of increasingly severe economic crises and environmental problems, our customers must promote environmental management that aims at establishing management strategies and reductions in environmental burdens. Both are essential if they are to maintain and continue their business.

We at Fujitsu provide environmental solutions to support our customers' environmental management. We evaluate our customers' environmental activities and we "render visible" issues that must be improved in an integrated manner from a management standpoint. We propose measures that resolve environmental issues in a way that conforms with our customers' business strategies. Furthermore, our efforts are not limited to evaluating the current situation and proposing measures; we also support continuously increasing the level of our customers' environmental management by iterating the PDCA cycle.

When implementing an environmental solution, we propose optimal combinations of products and services from our extensive lineup that marshals Fujitsu's rich experience and know-how, including the collection and analysis of environmental information from within the organization, chemical substances management, facilities infrastructure management, and office power consumption management.

## Environmental Solution Example

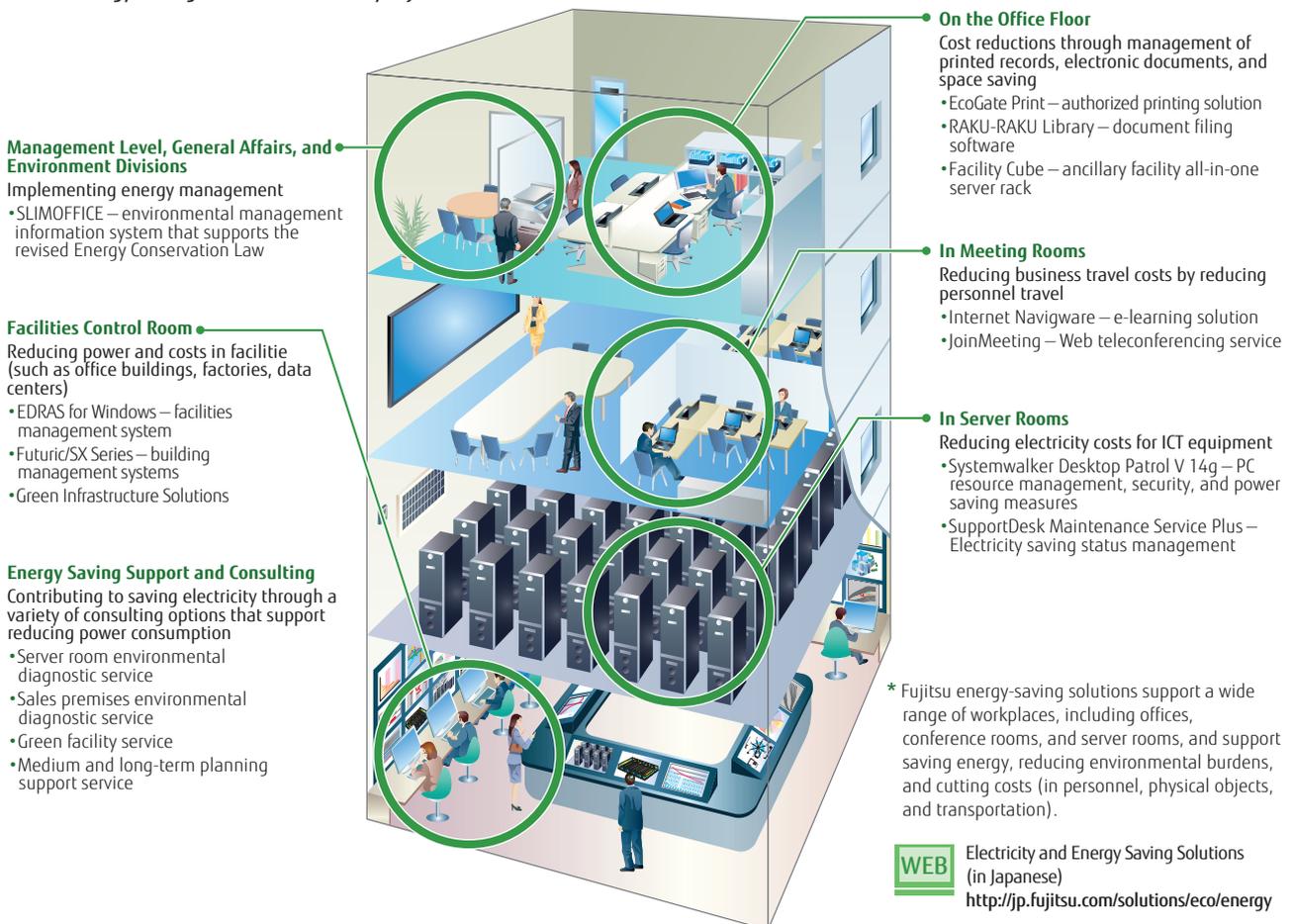
### Starting to Provide Energy-Saving Solutions

According to the revisions of the Japanese Energy Conservation Law that went into effect in April 2010, every individual business operator whose total annual energy use exceeded 1,500 kl when converted to its crude-oil equivalent must report that usage to the government. As a result, there were businesses mainly involved in office work and manufacturers owning medium-sized factories who did not previously have to file but were now required to report this usage. Furthermore, businesses subject to this law are required to make efforts to improve energy efficiency by at least 1% on average per year. For corporations, in addition to complying with such legal obligations, saving energy is a critical issue that they must face from the standpoints of both CSR and cost reduction.

Therefore, in FY 2010, we released "energy-saving solutions" that combine tools and processes to resolve such problems.

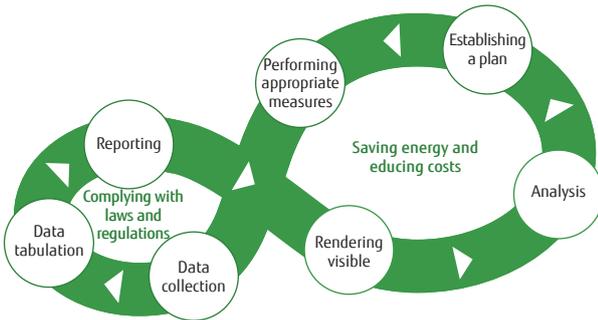
First, processes form a foundation in which we iterate the PDCA cycle, and this becomes the cornerstone of energy-saving activities. Even if a business simply introduced new equipment, collected and tabulated energy consumption data from each division, and reported that to the government to deal with the revised Energy Conservation Law, this would be mere compliance with the law and would not be a true resolution of the problem. The essential aspects here are saving energy and reducing costs

### Various Energy-Saving Solutions Provided by Fujitsu



by implementing the whole process of rendering the data visible, analysis, forming a plan, and taking any required measures. Also, after taking the required steps to check the effect, they must also collect and tabulate data and aim for further improvements. We at Fujitsu support our customers in implementing this Infinity Loop (shown in the accompanying figure).

**The "Infinity Loop" that Promotes Energy Savings and Cost Reductions**



Furthermore, tools are necessary to actually iterate the PDCA cycle in accordance with the process. For example, we use the SLIMOFFICE environmental management information system in data collection and tabulation, reporting, and rendering visible. We support the analysis and forming of phased plans with consulting

services provided by Fujitsu Facilities Ltd. For the phase in which the necessary measures are implemented, we provide an extensive set of Fujitsu tools, including electronic document creation, management of printed records, and videoconferencing tools. These processes and tools form two-fold support and powerful back up for our customers' daily energy saving efforts.

Additionally, it is important to increase the motivation of each and every employee to achieve energy savings. Fujitsu doesn't just render data visible to those in charge of energy savings, we also consider it important to make this data visible to employees. For example, by creating a mechanism that displays the previous day's energy usage when an employee arrives at work and first turns on his or her PC, it becomes possible to rank individuals or divisions and to recognize individuals or divisions that achieve energy saving targets. Raising the interest and motivation of employees with positive approaches such as this can be effective in leading to successful energy saving efforts. We will continue to work to improve our support for our customers' energy saving efforts through processes, tools, and proposals that lead to increased employee motivation.

As an electricity-saving measure associated with the Great East Japan Earthquake, we started an energy-saving advice service in June 2011 through which we can provide the Fujitsu Group's energy saving know-how to our customers.

**Adoption Example Dainippon Screen Mfg. Co., Ltd.**

**Consolidated management of environmental management information achieved and data collection and tabulating work load reduced by 20%**

Dainippon Screen, which develops and manufactures printing equipment and manufacturing equipment for semiconductor and display products, had previously managed their energy consumption on a per business site basis. The enormous amount of work required to organize the data was a burden when their environment and safety promotion division assembled the data for every business site.

Here, after looking into the systematizing of this work, the superiority of a standard template and pricing became evident and the customer adopted the Fujitsu SLIMOFFICE EX environmental management system. Dainippon Screen started using this system in 2009.

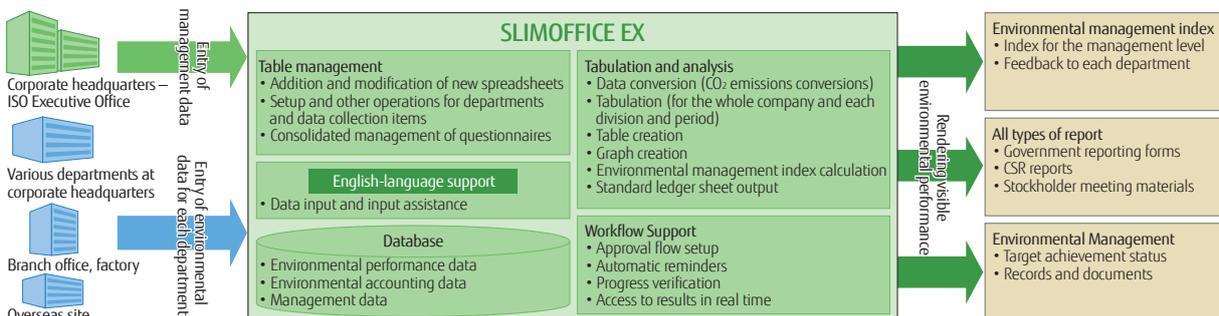
SLIMOFFICE EX is a dedicated software system for consolidated management and analysis of the entire process from the collection of environmental performance data through environmental accounting. This system implements our standard template, which assembles

Fujitsu's know-how and can easily create the materials required for environmental reporting documents and the regular reports that must be filed under Japan's revised Energy Conservation Law.

As a result of adopting SLIMOFFICE EX, in addition to consolidating management of relevant information and becoming able to analyze its environmental activities, Dainippon Screen was able to reduce the amount of work associated with data collection and tabulation by about 20% and its CO<sub>2</sub> emissions by 13%.

Furthermore, in July 2010, Dainippon Screen acquired the world's first international certification for the ISO 50001 energy management system of their Rakusai business site. In addition to support for ISO 50001, we also plan to apply the SLIMOFFICE EX software system to activities other than environmental ones, for example labor and safety management.

**Overview of SLIMOFFICE EX**



# Efforts to Prevent Global Warming

We are examining all of our business operations in our efforts to reduce greenhouse gas emissions—not only factories and offices but also transportation and the products and services we provide.

## Basic Approach

We are working to reduce emissions of greenhouse gases associated with all our Group business activities. These efforts include reducing emissions of CO<sub>2</sub> due to energy consumption and other greenhouse gases at our factories and offices and reducing emissions associated with transportation (see page 62).

Furthermore, we are working to prevent global warming throughout all areas of business activity by contributing to reduced emissions of greenhouse gases by our customers, industry, and society in general by developing Green Products and Super Green Products (see page 45) that contribute to reducing environmental burdens and by providing IT solutions (see page 51).

## Preventing Global Warming from the Business Site Greenhouse Gas Emission Reduction Targets

We have set “reducing our total greenhouse gas emission by 6% by the end of FY 2012 compared with FY 1990 (the breakdown for total emissions is a 5% reduction in CO<sub>2</sub> due to energy consumption and a 20% reduction in gasses other than CO<sub>2</sub>)” as a goal of the Fujitsu Group Environmental Protection Program (Stage VI).

Our actual total emissions for FY 2010 globally were about 1.185 million tons, which is a reduction of about 128 thousand tons from the previous fiscal year and an 11.7% reduction from FY 1990.

## Reduction of CO<sub>2</sub> Emissions due to Energy Consumption

CO<sub>2</sub> emissions due to energy consumption are responsible for about 85% of the Fujitsu Group’s greenhouse gas emissions.

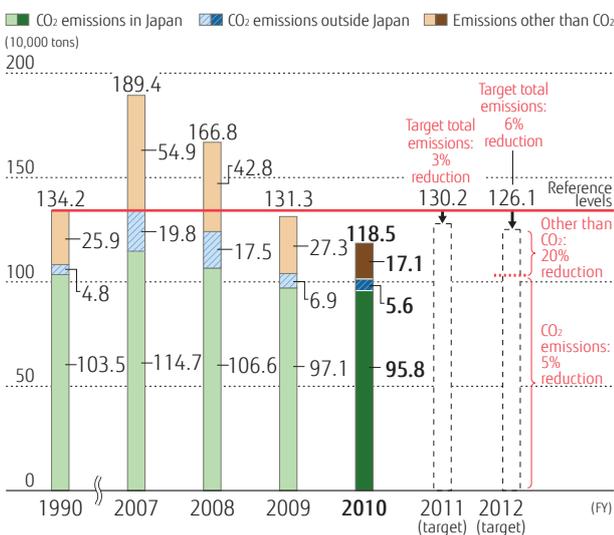
Therefore, we continuously work to improve the following energy-saving measures to reduce CO<sub>2</sub> emissions.

- Energy-saving equipment, focusing on motive-power facilities (introduction of free cooling, inverters, energy-saving facilities, fuel conversion, etc.)
- Increased efficiencies through revised manufacturing processes, accompanied by proper motive-power facility operation and improvement of management
- Adjusting appropriate room temperature for office air conditioning, saving electricity for lighting and office automation equipment
- Promotion of the measurement and visualization of energy consumption and proactive use of that data
- Use of natural energy sources such as solar power

Further, we set up a new Low Carbon Committee (see page 66) at the corporate level in September 2008, establishing reduction targets for each business unit. Stronger measures to achieve these targets follow reforms to processes and equipment (in mounting, assembly and testing) and the development of new technologies. Moreover, our Capital Investment Guidelines define the economic and environmental criteria for investment as we identify and urgently implement priority measures.

As a result, our actual energy-consumption CO<sub>2</sub> emissions for FY 2010 were about 1.014 million tons (958 thousand tons in Japan, 56 thousand tons outside Japan), which corresponds to a 27 thousand ton reduction from the previous fiscal year and a 6.4% reduction from FY 1990.

Trends in Total Greenhouse Gas Emissions (whole group and global)



\* CO<sub>2</sub> conversion coefficient for purchased electric power: Calculations have been performed with a fixed value of 0.407 ton of CO<sub>2</sub> per MWh since FY 2002 for performance reports in our Environmental Protection Program.

\* Greenhouse gases other than CO<sub>2</sub>: These are converted to equivalent amounts of CO<sub>2</sub> using the global warming potential (GWP) of each gas. Our FY 1995 performance is taken to be the emissions in FY 1990.

### Activities Example

#### Reducing CO<sub>2</sub> emissions with outside air cooling and the adoption of turbo cooling units for air conditioning

When we upgraded the aging water-cooled chillers at the Fujitsu Yatsuo Center, we reviewed the facility to determine an appropriate cooling capacity and upgraded to turbo cooling units with high energy efficiency. In contrast with the COP (energy consumption efficiency) value of 4.1 for the water-cooled chillers, the turbo cooling units have a COP value of 5.7\* and achieve a reduction in CO<sub>2</sub> emissions due to energy savings.

Furthermore, we adopted equipment that draws in the cool, comparatively damp, outside air that is characteristic of Toyama Prefecture for server room air conditioning. We expect to save an amount of power roughly equal to that consumed by one server air conditioner during periods when outside air is used. We expect to achieve an annual CO<sub>2</sub> emissions reduction of 116 tons through these measures.

\* The values shown here for the water cooled chillers and outside air cooling are based on actual operating performance and the values for the turbo cooling units are based on the manufacturer’s catalogs.

## Reducing Emissions of Greenhouse Gases Other than CO<sub>2</sub>

The semiconductor industry has established a voluntary action plan to reduce the emissions of PFC, HFC and SF<sub>6</sub>, which are all greenhouse gases.

We in the Fujitsu Group have set a target of reducing emissions by 10% relative to FY 1995 levels by the end of FY 2010, which is the industry target, and furthermore have set a target of a 20% reduction by the end of FY 2012 for the Fujitsu Group Environmental Protection Program (Stage VI). In our semiconductor divisions, we have changed to gases with a lower global warming potential and, for example, continue to install equipment to extract harmful materials in new and existing fabrication lines.

In FY 2010, we reduced the amount of these emissions measured in global warming potential (GWP) equivalent by 101 thousand tons to about 171 thousand tons by changing gases used and other measures as well as installing 15 new harmful materials extraction units. Since this corresponds to a 33.9% reduction compared to FY 1995, we succeeded in achieving the industry target.

## Promoting the Use of Renewable Energy

Although we have adopted renewable energy sources such as solar generation at some of our business sites, in the Fujitsu Group Environmental Protection Program (Stage VI), we have set increased use of renewable energy as a new goal, and introduced the target of installing three times as much capacity by the end of FY 2012 as we had in FY 2007.

In FY 2010, we installed 30 kW of solar generating capacity in the Fujitsu FIP data center, which opened in December, and 120 kW at FDK TWICELL. This resulted in a total installed capacity of solar generating equipment of 265 kW at the end of FY 2010, which is 4.8 times that of FY 2007.

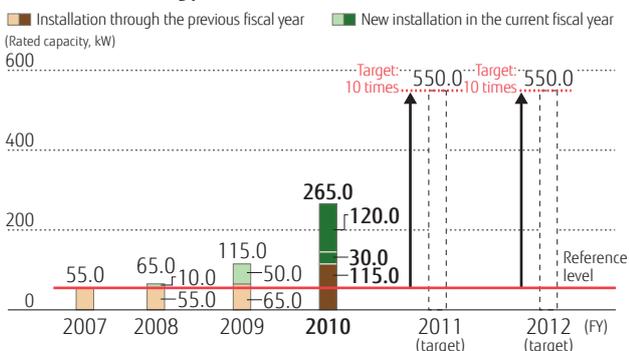
Additionally, we increased our target value to 10 times the FY 2007 level by the end of FY 2012, based on our current installation plans.

FDK TWICELL manufactures rechargeable batteries and has implemented a mechanism in which solar generated electricity is used for initial charging of batteries before shipment.



Solar panels at FDK TWICELL

## Cumulative Total of Installed Solar Generation (renewable energy\*)



\* **Renewable energy utilization ratio:** Calculated based on the rated capacity of solar generation equipment installed at Fujitsu business sites.

## Responding to the Japanese Revised Energy Conservation Law

As a result of the revisions to and enforcement of the Japanese Energy Conservation Law\*<sup>1</sup>, business operators are now required to grasp their annual energy usage at all their business sites in Japan.

In the Fujitsu Group, we use a system (Fujitsu FIP's SLIMOFFICE) that grasps and tabulates the amount of energy we used in all of Japan, include the office space we rent, and manages the amount used by each company in the Group. Note that the Fujitsu Group includes 26 companies that fall within the class of Specified Business Operators (businesses whose annual energy usage is in excess of 1,500 kl when converted to a crude oil equivalent value) newly stipulated in the revised law.

Also, the amount of energy used by the Group within Japan under the Energy Conservation Law in FY 2010 was 618 thousand kl, and that corresponds to CO<sub>2</sub> emissions of about 1.096 million tons\*<sup>2</sup> based on the Law Concerning the Promotion of Global Warming Countermeasures\*<sup>3</sup>, which was also revised.

\*<sup>1</sup> **Energy Conservation Law (abbrev.):** the Law Concerning the Rational Use of Energy.

\*<sup>2</sup> **About 1.096 million tons:** There are differences in ranges for tabulation that include tenants and calculations based on CO<sub>2</sub> conversion coefficients for each electric power company for results reporting under our Environmental Protection Program.

\*<sup>3</sup> A system for calculating, reporting, and disclosing the amount of greenhouse gas emissions stipulated by Japan's Law Concerning the Promotion of Global Warming Countermeasures.

## Participating in a Trial Emission Trading Scheme

We participated from FY 2008 until FY 2010 in the Japanese government's domestic emissions trading scheme pilot project, launched in FY 2008 with the aim of examining further global warming countermeasures based on a medium to long term viewpoint.

Continuing in FY 2010, we were validated by an external institution according to the trial emissions trading scheme\* pilot project, our emissions level for FY 2009 was verified, and we achieved our targets for the FY 2008 to FY 2009 period.

\* **Trial emissions trading scheme:** The principal framework for the trial implementation of an integrated emissions trading market in Japan. Participants voluntarily establish emission reduction targets and are allowed to supplement their own reduction efforts by trading emission allowances and credits.

## Efforts Related to Scope 3

We have disclosed greenhouse gas emissions due to corporate activities through the Carbon Disclosure Project (CDP)\* for many years and we are also working to calculate our emissions of greenhouse gases including those of the supply chain.

Currently, the Scope 3 Accounting and Reporting Standard for calculating emissions from the whole supply chain is being studied for standardization in fall 2011 under the GHG Protocol, which is an international guideline for calculating and reporting greenhouse gas emissions. Also, in Japan, the Ministry of the Environment held an investigative commission on methods for calculating greenhouse gas emissions in the supply chain starting in July 2010. As a member of the subcommittee on product systems of that commission, we collected and assessed the data, and analyzed the precision and completeness of the calculated values. Based on the results of this case study, we are working towards methods for calculating the Scope 3 emissions internally.

\* **Carbon Disclosure Project (CDP):** A project in which institutional investors and others cooperate to request disclosure of information concerning climate change strategy and greenhouse gas emissions from the world's leading corporations.

# Reducing Environmental Burdens at the Factory

We promote comprehensive environmental protection activities based on the Fujitsu Group Environmental Protection Program (Stage VI) at the factories that perform our manufacturing.

## Approach to Reducing Burdens at the Factory

The Group continually strives to reduce the quantities of materials, water resources, and energy used at its factories, as well as the amounts of chemicals and waste materials generated and atmospheric pollutants emitted, while trying to minimize manufacturing costs. It also takes a rigorous approach to complying with laws and regulations and eliminating environmental risks.

## Promotion of Green Process Activities in the Semiconductor Fabrication Process

In the Fujitsu Group, we promote Green Process activities, which implement, in coordination with cost-saving activities, measures such as optimizing the energy and amount of raw materials used in manufacturing processes and switching to alternative components with lower environmental burdens.

Previously, we promoted Green Process activities at all Fujitsu Group manufacturing sites. However, starting in FY 2010, we have, based on the past results of these activities, specialized these efforts for semiconductor fabrication factories that require particularly large inputs of raw materials such as chemical substances. We are also promoting activities at other manufacturing sites that focus on facilities and process improvements and on new technology development in the manufacturing areas (mounting, assembly, and testing processes) which we established in FY 2008.

In the Green Process activities at semiconductor fabrication

factories, as we did before, we first identify the total input of materials (raw materials, chemical additives, etc.) and energy into the process, together with their purchasing costs, and then establish our own original CG (Cost Green) index\*. Based on this, we then set quarterly or semiannual reduction targets (planned values) at the production line level for each factory and evaluate the degree of attainment of these targets while going through the PDCA cycle. Based on the results, we try to continually improve our production processes through initiatives like introducing new manufacturing technology, revising our processes, and improving the work procedures.

Also, for activities other than those for manufacturing processes at factories, if promoting the activity in coordination with the manufacturing process would be more efficient, we adopt the CG index (Cost/Green index) approach in those activities as well.

\* **CG index: Cost/Green index:** This index describes the product of input volume used per product, the cost, and the environmental impact (on a scale from 1 to 10).

## Reducing the Amount of Waste Generated Basic Approach

Working towards a recycling-minded society, our 3R\* policy encourages all employees to separate waste materials into different categories for effective recycling.

\* 3R: Reduce, Reuse, and Recycle

## FY 2010 Performance

In Fujitsu Group Environmental Protection Program (Stage VI), we set the goal of reducing the amount of waste generated by our business operations by 20% compared to FY 2007 levels by the end of FY 2012.

We generated 31,063 tons of waste in FY 2010, which was a 1.3% reduction from the previous fiscal year's level and a 20.1% reduction from the FY 2007 level. The reasons for these reductions include the conversion of waste paper and waste acid to valuable materials.

These results include the Japanese companies FDK TWICELL and FDK Tottori, which have become consolidated companies as of this fiscal year.

Example of a Green Process Activity  
• Fujitsu Integrated Microtechnology Ltd.

### Reducing Industrial Waste by Processing Waste Plating Solution at the Factory Itself

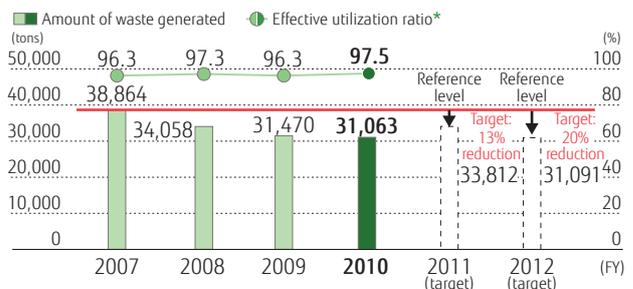
At Fujitsu Integrated Microtechnology, which handles the Fujitsu Group semiconductor product packaging and test processes, each division within the factory sets its own targets for the Green Process activities it promotes.

For example, at the Kyushu plant, when we moved the previously subcontracted plating process in house, we decided to process some of the waste plating solution that had previously been subcontracted for processing as industrial waste to a vendor by using liquid waste processing facilities within the plant and so reduced the amount of liquid waste shipped out of the plant.

To process waste plating solutions within the plant, we installed new waste plating solution piping and at the same time as asking the plant builder for opinions on the load it would impose on the wastewater processing equipment, we repeatedly tested to determine the optimal values for conditions such as pH adjustment and the amount of processing chemicals added for the amount of liquid waste entering the equipment.

As a result of these efforts, we reduced both the CG value and costs by 89.4% on average compared to the previous method.

### Amount of Waste Generated



\* This ratio includes waste materials that are the object of zero emissions policies including ordinary waste (Japan only).

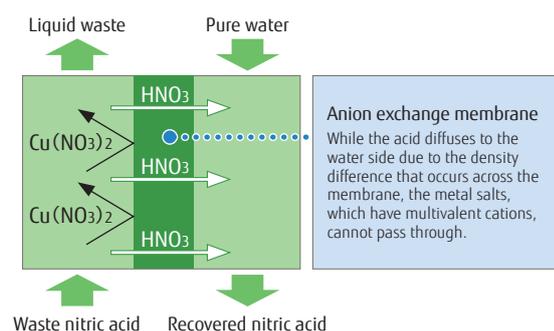
Example of a Waste Generation Reduction Activity  
 •Shinko Electric Industries Co., Ltd.

### Recovery and Reuse of Nitric Acid Waste in the Plating Process

We use nitric acid to strip off and remove copper and nickel that has adhered to plating jigs and plating tanks at the Shinko Electric Industries Co., Ltd. Wakaho plant, and process that acid as liquid waste containing dissolved metals.

By purifying and concentrating this liquid waste using a diffusion dialysis method, we made it possible to recover and reuse the nitric acid. As a result, we were able to reduce the amount of nitric acid used by about 1,000 tons per year.

#### Nitric Acid Recycling Using Diffusion Dialysis



## Reducing Water Use

### Basic Approach

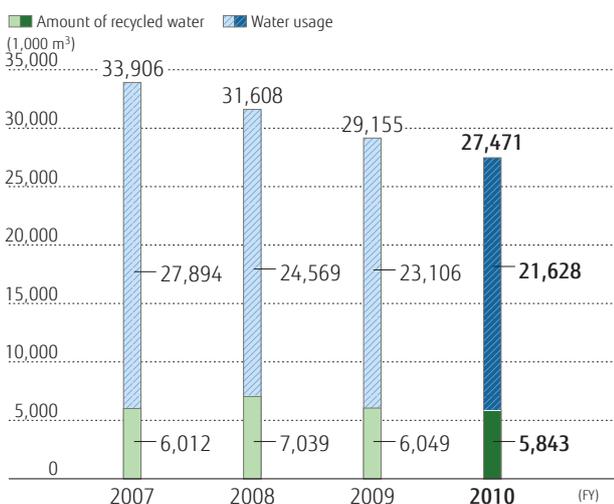
We are working to reduce our use of water resources through recycling and reuse of service water, the use of rainwater, and other measures.

### Results for FY 2010

Our water use for FY 2010 was 21,628 thousand cubic meters. This was a 6.4% reduction from FY 2009 and a 12.0% reduction from FY 2008.

The ratio of recycled water to total water use was 27.0% in FY 2010, which was an increase from the 26.2% ratio in FY 2009.

#### Trends in Water Use



## Reducing Chemical Substance Emissions

### Basic Approach

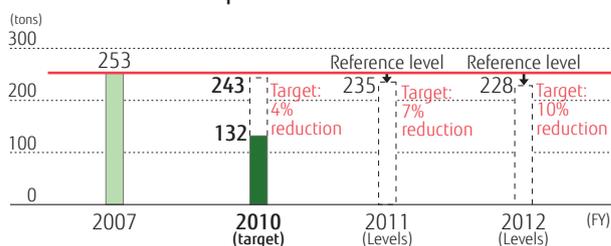
Prevention of environmental risks that could lead to environmental pollution or adverse health effects due to the use of harmful chemical substances has been established as our basic policy for chemical substances management. We manage the amounts used for about 1,300 chemicals, and we work to reduce the amount discharged and implement appropriate management at every business site.

### Results for FY 2010

We set the goal of reducing emissions of specific chemical substances by 10% compared to FY 2007 by FY 2012 in the Fujitsu Group Environmental Protection Program (Stage VI).

Emissions of specific chemical substances by the whole Fujitsu Group in Japan in FY 2010 were 132 tons, which was a 48% reduction compared to the FY 2007 reference year.

#### Trends in Emissions of Specific Chemical Substances\*



\* Specific chemical substances: Of the substances that are the object of VOC and PRTM regulation, those for which the amount handled is at least 100 kg/year, and one substance selected from the top three substances in emission levels for the reference year.

Example of Reducing Specific Chemical Substances

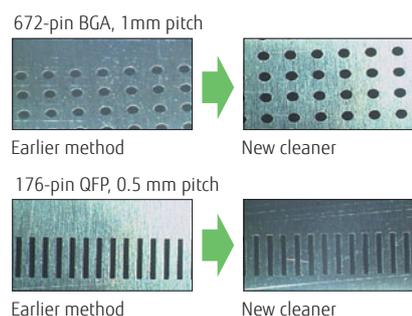
### Reducing VOC Emissions by Substitute Metal Mask Cleaners

We have been working since 2005 to reduce VOC emissions at the Fujitsu Nasu plant, which mainly manufactures cell phones and cell phone base stations.

Among VOCs of concern, we previously used 1-methoxy-2-propanol as a cleaner for the metal masks used when printing solder paste on printed circuit boards at the Nasu plant. As the result of evaluating an isoparaffin family hydrocarbon solvent that does not contain this substance, we determined that the cleaning ability of this solvent is not inferior to that of the earlier cleaner. In July 2010, we started switching over to non-VOC cleaners and succeed in completely eliminating the use of 1-methoxy-2-propanol.

#### Comparison of Metal Mask Cleaning Quality

The same quality level was achieved after switchover (lower photograph).



## Reducing Environmental Burdens at the Factory

### Environmental Liabilities

We intend to be a corporate group that accurately forecasts and evaluates today the extent of its environmental liability tomorrow, that does not defer settlement of this liability to a later date, and that discloses information to its stakeholders on the soundness of the Group from a medium- to long-term perspective. To achieve this, at the end of FY 2010 we recorded as a liability on the Group's consolidated balance sheet 5.38 billion yen soil-pollution cleanup costs, high-level PCB waste disposal costs, and asbestos processing costs during facilities demolition. Based on data previously acquired, this total is the amount we calculate to be necessary for the Fujitsu Group in Japan to carry out these tasks.

For processing waste with high levels of PCBs (transformers and capacitors), we have registered in advance with Japan Environmental Safety Corporation (JESCO), which processes PCB waste under Japanese government supervision, and perform this processing based on JESCO plans.

### Responding to Soil and Groundwater Pollution

We have reviewed our internal rules established in FY 2006 in response to soil and groundwater problems and will handle such problems based on these revised rules for soil and groundwater surveys, policies, and disclosure. In the future, at the same time as performing planned surveys and, if pollution is discovered, implementing cleanup operations and countermeasures appropriate for the conditions at each business site, we will also disclose relevant information in collaboration with government authorities.

The following website gives an overview of our initiatives to combat soil and groundwater pollution, together with the results of our surveys of groundwater pollution at our sites in Japan and the status of our cleanup operations at those sites.

**WEB** Our initiatives to combat soil and groundwater pollution (in Japanese)  
<http://jp.fujitsu.com/about/csr/eco/factories/gwater/>

### Status of New Soil and Groundwater Pollution Measures Undertaken in FY 2010

A voluntary survey in FY 2010 revealed soil and groundwater contamination at one site. We reported the state of contamination at this site and explained our countermeasures to local citizens and authorities.

In FY 2010, we completed the soil and groundwater decontamination work started in 2007 at the Suzaka plant and reported its completion to the local citizens and authorities. We will continue to perform periodic groundwater monitoring in the future.



Contaminated soil removal from an underground storage tank at the Suzaka plant

### Measures to Purify Soil and Groundwater Pollution Due to Past Business Activities

We have dug wells to monitor groundwater contamination near our sites where soil or groundwater contamination has been found. We continuously monitored seven such sites in FY 2010.

The table below lists the largest of the most recent measurements for chemicals whose measurements are recognized to have exceeded legal limits in FY 2010 stemming from past business activities.

#### Business Sites Where Soil or Groundwater Contamination Has Been Found

Site Name	Location	Cleanup and Countermeasure Status	Monitoring Well Maximum Value (mg/l)		Regulation Value (mg/l)
			Substance	Measured value	
Kawasaki plant	Kawasaki City, Kanagawa Prefecture	We are continuing to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	2.5	0.04
			Trichloroethylene	0.452	0.03
Oyama plant	Oyama City, Tochigi Prefecture	We are continuing to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	3.075	0.04
			Trichloroethylene	0.452	0.03
Nagano plant	Nagano City, Nagano Prefecture	We are continuing to clean up VOCs initiatives by pumping and aeration.	Cis-1, 2-dichloroethylene	0.33	0.04
			Trichloroethylene	0.045	0.03
Shinetsu Fujitsu	Shinano machi, Kamiminochi Gun, Nagano Prefecture	We are continuing to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	0.048	0.04
Fujitsu Optical Components	Oyama City, Tochigi Prefecture	We are continuing to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	0.095	0.04
			1, 1-dichloroethylene	0.024	0.02
			Trichloroethylene	0.31	0.03
FDK Sanyo plant	Sanyo-Onoda City, Yamaguchi Prefecture	We are continuing to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	0.061	0.04
			Trichloroethylene	0.11	0.03
FDK Washizu plant	Washizu, Kosai City, Shizuoka Prefecture	We are continuing to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	0.42	0.04
			Trichloroethylene	0.16	0.03
			Tetrachloroethylene	0.044	0.01

# Reducing the Environmental Burden in Offices

We strictly observe all laws concerning the environment and also work to save energy and achieve zero waste emissions, not only in our factories but also in all our business offices in Japan and overseas.

## Green Office Systems

To promote environmental burden reductions that exhibit the greatest possible degree of group governance, even in business offices, we initiated our Green Office system in FY 2007. This system comprehensively evaluates aspects such as the level of environmental consideration and independent efforts at each office and renders visible this evaluation by assigning one of three levels (see the following figure).

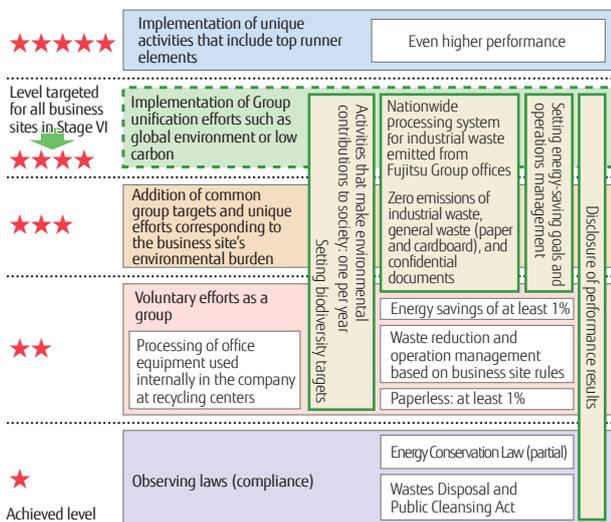
In the Fujitsu Group Environmental Protection Program (Stage V), we established the goal of achieving a level of two stars (★★) or more at every office in Japan covered by this system by the end of FY 2009 and we aim to continuously improve and increase our level of environmental awareness. As a result of this effort, all of the offices at 371 sites had achieved the three star (★★★) level by the end of FY 2009. At the same time we also achieved zero waste emissions\* of waste materials from all 371 sites, which was the largest such effort in Japan.

In the Fujitsu Group Environmental Protection Program (Stage VI), which started with FY 2010, we set achieving a level of four stars (★★★★) or higher at every office in Japan covered by this system by the end of FY 2012. In addition to the three star (★★★) level conditions, the following items were added to the four star (★★★★) level conditions: biodiversity conservation activities, disclosure of environmental information to stakeholders, and unification of industrial waste processing for office emissions. Furthermore, there are now five achievement levels. At every office, at the same time as initiating activities to achieve this goal, we plan to create opportunities to discuss issues common to all offices and promote environmental activities intimately linked to the local community.

For our overseas sites, we initiated surveys of current conditions in FY 2010. In the future we will collect proposals based on the results of this survey and we are looking into implementing trials of those proposals.

\* Zero waste emissions: For simple calculations of emissions from the incineration or landfill disposal of industrial waste and paper waste

### Overview of the Green Office Evaluation System



### Activities Example

#### Reducing Power Consumption at Offices by Using Smart Power Sockets

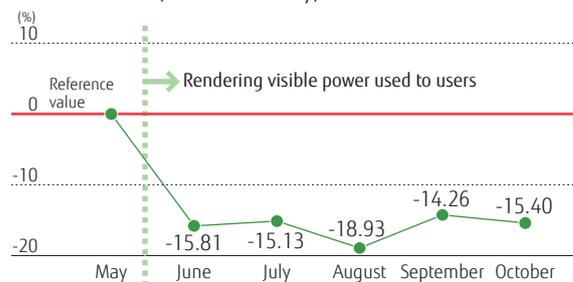
In May 2010, we started trial use of smart power sockets (which include a miniature power sensor) in some Fujitsu offices and succeeded in reducing average monthly power consumption by about 15%. This was due to increased individual awareness of energy saving, in such things as making special efforts to turn off personal computers when not in use by rendering visible power used in individual employee and individual equipment item units.

The smart power socket is a power tap that uses miniature high-resolution power sensor technology developed by Fujitsu Laboratories and can detect the power consumed by the connected equipment. This device renders visible the waste and variation in power used in individual employee and individual equipment item units and promotes energy saving without degrading business productivity. The detected values can be displayed on personal computers or accessed over a network. These smart power sockets have been marketed since April 2011 by Fujitsu Component Limited.



Smart power socket and gateway

#### Reduction Rate of Power Consumption by Using Smart Power Sockets\* (Per business day)



\* Results of tests at some Fujitsu offices

## Reducing Waste from Offices

### On-Site Waste Disposal Auditing

The important Law on Waste Disposal and Cleaning applies to all offices in Japan.

To confirm that ICT equipment and other types of industrial waste are being properly dealt with, we perform standardized group-level checks of the regular on-site audits both of the security levels at companies that process confidential documents and at Fujitsu Recycling Centers that have elected to dispose of in-house ICT equipment. A member of the Fujitsu Corporate Environmental Strategy Unit visits both the recycling centers and companies that process confidential documents once a year with the person in charge of waste disposal from the relevant office, using a standardized checklist to check the documentation and the onsite disposal operation itself.

# Green Procurement with a Centralized Global Procurement System

We are promoting green procurement together with our business partners by using our unique proprietary centralized global procurement system to provide our customers with products and services having minimal environmental burdens.

## Fujitsu Group Green Procurement Direction

We are aggressively promoting green procurement activities together with our business partners based on the Fujitsu Group Green Procurement Direction describing our basic approaches to procurement of eco-friendly parts, materials, and products and items we require of our business partners.

**WEB** Fujitsu Group Green Procurement Direction  
<http://www.fujitsu.com/global/about/procurement/green/>

## Green Procurement Requirements for Our Business Partners

We request that our business partners implement the following two activities to promote green procurement.

### Establishment of Our Business Partners' EMS\*

We require as a matter of principle that all our business partners establish a third-party certified EMS to ensure that they continuously implement environmental burden reduction activities. We also periodically survey the status of their EMS implementation by using our original survey form.

\* EMS: Environmental management system

### Establishment of Our Business Partners' CMS\*<sup>1</sup>

We request our business partners to establish a chemical substances management system (CMS) based on the JAMP\*<sup>2</sup> guidelines on management of chemical substances contained in products. If their management system is inadequate when we audit their manufacturing sites, we will provide support for correctional efforts that aim to strengthen their management system in the supply chain.

As of the first half of FY 2010, all of them covered by this effort had completed establishment of a CMS. We will continue with these efforts in the future.

\*<sup>1</sup> CMS: Chemical substances management system

\*<sup>2</sup> JAMP: Joint Article Management Promotion-consortium  
<http://www.jamp-info.com/english/>

## Green Procurement Activities Based on the Fujitsu Group Environmental Protection Program (Stage VI)

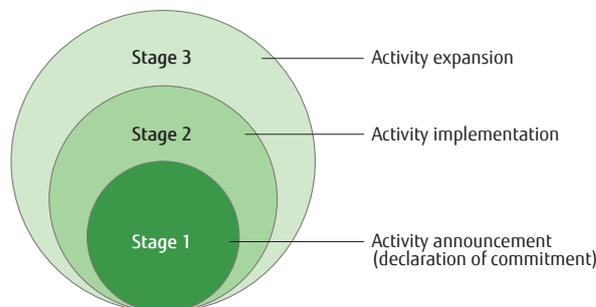
Since FY 2010, we have been promoting the limitation or reduction of CO<sub>2</sub> emissions and the conservation of biodiversity as the Fujitsu Group Environmental Protection Program (Stage VI) and we ask all of our business partners to implement activities regarding these two themes.

We have set a target of 100% implementation by our business partners providing us parts and materials by the end of FY 2012 as one goal of the Fujitsu Group Environmental Protection Program (Stage VI). We drew up an activity evaluation index for the situation of our business partners' actions and request that they carry out activities in line with this index to achieve the target.

At the start of these activities, we held 14 briefing sessions for both domestic and overseas business partners and a total of about 1,300 companies participated.

## Drawing up an Activity Evaluation Index

We set up an original three-stage index for measuring the situation of our business partners' activities and requested their cooperation.



## Promoting Our Business Partners' Efforts to Limit or Reduce CO<sub>2</sub> Emissions and to Conserve Biodiversity

We provided them with our original CO<sub>2</sub> emissions calculation tool to assist with their actions for limiting or reducing CO<sub>2</sub> emissions, and we promoted the establishment of their own internal structure for it by holding a briefing meeting for each business partner to grasp its CO<sub>2</sub> emissions or target.

We provided our original guidelines for biodiversity conservation introducing detailed informative explanations of activities and typical activity examples and our original checklist tool that readily evaluates the current status of their activities. These were provided to our business partners only. We also invited about 20 business partners to our seminars on these themes to improve their knowledge and actions.

We achieved the 60% implementation rate that was the target for the end of FY 2010 as a result of these efforts. We are aiming at a rate of at least 80% for FY 2011 and plan to provide tools and seminars for promoting these efforts in order to support our business partners in making further improvements in these areas.

### TOPICS

## Receiving the Grand Prize at the Green Purchasing Awards\*

Our activity for biodiversity conservation was awarded the grand prize at the Twelfth Green Purchasing Awards in October 2010.

Our efforts were highly acclaimed for innovation and uniqueness. Specifically recognized were the Fujitsu Group's encouragement of its business partners to conserve biodiversity, the fact that we provided guidelines to our business partners, and that we set up an evaluation index.



Awards ceremony at the Green Purchasing Awards

\* **Green Purchasing Awards:** An awards system that aims to spread green procurement through the Green Purchasing Network.

# Environmental Considerations in Distribution

We are promoting the rationalization and streamlining of distribution while keeping the whole global supply chain in mind. We are also working to reduce the CO<sub>2</sub> emissions associated with distribution.

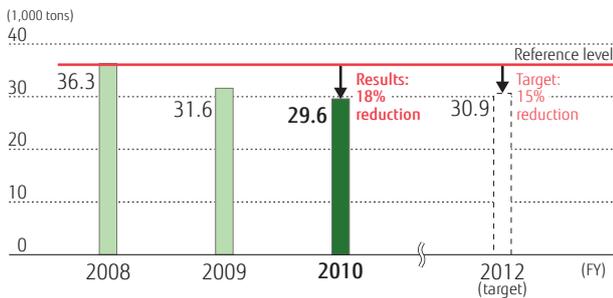
## Promoting Global Green Distribution

We are working on Green Logistics Activities which strive to reduce CO<sub>2</sub> emissions associated with transportation by coordination between the distribution divisions of all group companies and cooperation between manufacturing and sales divisions. Furthermore, we take advantage of partnerships with our business partners and strive to reduce the environmental burden associated with distribution across the whole supply chain.

Our goal was to reduce CO<sub>2</sub> emissions in domestic distribution by 11% compared to FY 2008 by the end of FY 2012 as proposed in the Fujitsu Group Environmental Protection Program (Stage VI). However, by expanding modal shifts and reducing the number of trucks, we were able to achieve an 18% reduction (this includes fluctuations in amounts distributed and the effects of the March 2011 earthquake) compared to FY 2008 in FY 2010. We have therefore increased our target for FY 2012 to a 15% reduction compared to FY 2008.

We have also started to measure the CO<sub>2</sub> emissions in international transportation and the transportation CO<sub>2</sub> emissions at overseas sites and thus are promoting green distribution activities globally.

Trends in CO<sub>2</sub> Emissions from Transportation (Fujitsu Group)



## Expanding Modal Shifts

We are working to reduce CO<sub>2</sub> emissions using modal shifts and are promoting effective activities based on rail transport and switching from air to surface transport. In FY 2010 we promoted such modal shifts for personal computers, cell phones, and purchased materials.

As a result of increasing our use of rail transport, we acquired Eco Rail Mark certification as established by the Japanese Ministry of Land, Infrastructure, Transport and Tourism and the Railway Freight Association in March 2011.



エコレールマーク  
Eco Rail Mark

## PCs

In August 2010, we switched from trucks to rail for transport of notebook personal computers for corporate customers and some maintenance parts shipped from Shimane Fujitsu Ltd. to the Tokyo distribution center. We implemented this by coordination between the factory and related divisions and moving up shipment times.

## Purchased Materials

From May 2010, we changed our method of transporting purchased imported materials from Tokyo Bay to Fujitsu Isotec Limited. In addition to the earlier 20-foot containers, we also changed from truck transport to rail transport for the 40-foot sea-going containers. This was because we are participating in the Ministry of Land, Infrastructure, Transport and Tourism's Rail Transport Model Business program and implemented this effort jointly with the Japan Freight Railway Company.

### TOPICS

#### Receiving Minister of the Environment's Award

We received the 2010 Minister of the Environment Award for the Prevention of Global Warming\* sponsored by the Ministry of the Environment for reducing CO<sub>2</sub> emissions through modal shift.

This award reflects the fact that we were given high marks for significantly reducing transportation CO<sub>2</sub> emissions by aggressively adopting modal shifts in cooperation between distribution companies and our related divisions and by implementing a consistent system from materials procurement through product shipment.

\* 2010 Minister of the Environment Award for the Prevention of Global Warming: This award, established in FY 1998, is awarded every year as part of the Ministry of the Environment's promotion of global warming countermeasures to an individual or group that achieved distinguished results in preventing global warming.

## Adopting Hybrid Vehicles

Starting in November 2010, we switched over to hybrid vehicles for the trucks owned by a cooperating transportation company used solely by Fujitsu for mail and package delivery in the Tokyo metropolitan area. These vehicles, equipped with ecological tires and Fujitsu in-vehicle terminals, reduce CO<sub>2</sub> emissions by improved fuel efficiency.



Newly adopted hybrid vehicle

## Drawing up the Fujitsu Group Green Logistics and Procurement Direction

We have formulated the Fujitsu Group Green Logistics and Procurement Direction, which specify our basic approach to green distribution and the matters we require of our suppliers. We will work to protect the global environment along with our suppliers through distribution activities based on this procurement direction.



Fujitsu Group Green Logistics and Procurement Direction (in Japanese)  
<http://jp.fujitsu.com/about/csr/eco/products/logistics/guide.html>

# Conservation of Biodiversity

We have set conservation of biodiversity to be a priority area in the Fujitsu Group Environmental Protection Program (Stage VI) and are promoting activities aimed at conserving biodiversity based on four action plan items.

## Basic Concepts

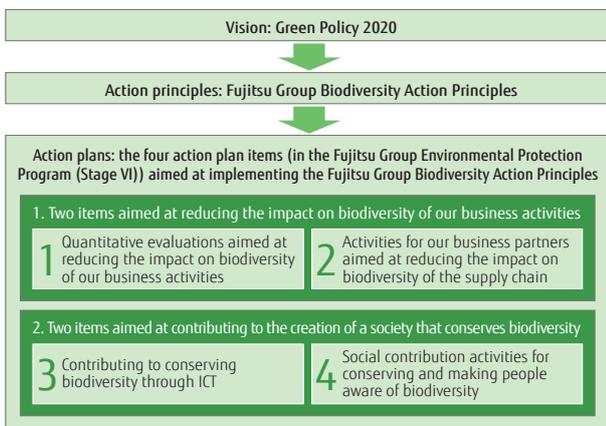
### Formulating the Four Action Plan Items that Aim at Conserving Biodiversity

Only the bounty of nature makes our daily lives possible. Like the provision of food and forests, climate regulation, water purification, recreation, etc., the functions that nature performs for mankind are incalculable. These functions are called "ecosystem services," and they depend on "biodiversity." The recent remarkable deterioration of ecosystems makes conserving biodiversity an urgent necessity to ensure sustainable ecosystem services.

Given this background, we set conserving biodiversity as one goal in the Fujitsu Group's medium-term environmental vision, Green Policy 2020, as published in July 2008. Furthermore, we set a goal of promoting specific efforts by 2020 for all of the items proposed in the leadership declaration for the Business and Biodiversity Initiative, which was signed at the ninth meeting of the Conference of the Parties (COP 9) to the Convention on Biological Diversity (CBD).

To achieve that goal, we settled on the Fujitsu Group

### The Fujitsu Group Biodiversity Action Principles and Four Action Plan Items



Biodiversity Action Principles in October 2009. In this, we introduced both (1) Pursuing the Conservation of Biodiversity and the Sustainable Use of Natural Resources in Business Activities and (2) Contributing to Building a Society that Ensures the Conservation of Biodiversity and the Sustainable Use of Natural Resources as themes for future efforts and established four related action plan items in the Fujitsu Group Environmental Protection Program (Stage VI), which started in FY 2010.

## Efforts towards Conserving Biodiversity

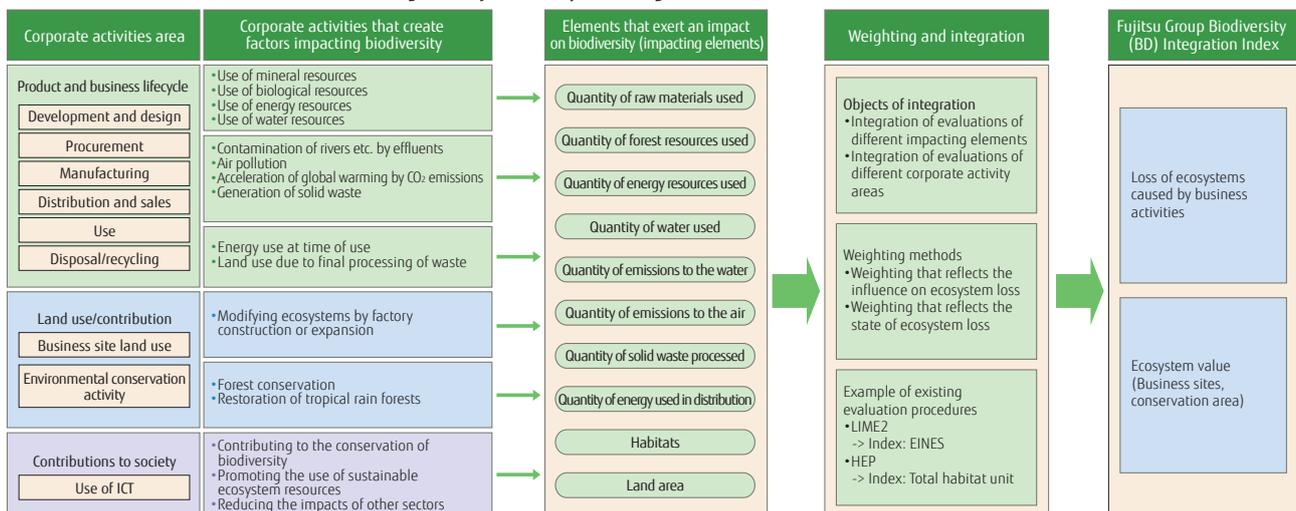
### Quantitative Evaluation to Reduce the Impact on Biodiversity of Our Business Activities

To conserve biodiversity, it is important to evaluate the quantitative impact of business activities on biodiversity and to promote activities that reduce that impact with targets set appropriately.

Accordingly, we first analyzed how our business activities affected biodiversity and ecosystem services. From this, we understand that our influence on ecosystems mainly depends on the use of water and forest resources. We also understand that there were possibilities of impact on biodiversity through (1) use of mineral resources and energy resources, (2) waste processing, (3) land development and reform caused by its use as business sites, (4) contamination due to emissions of chemical substances into the air and water, and (5) climate change due to emissions of greenhouse gasses to the atmosphere.

To reduce such impacts, in FY 2010 we constructed the Fujitsu Group Biodiversity (BD) Integration Index as a means of quantitatively evaluating the influences of business activities on biodiversity. In this framework, we identify business activities that impact biodiversity and extract impacting elements as quantitative data related to this business activity. Next, we use existing methods to evaluate these impacting elements so as to weight and integrate them, and it can

### Framework for Quantitative Evaluation Using the Fujitsu Group BD Integration Index



therefore ultimately provide an index of the loss of ecosystems caused by business activities or of ecosystem value.

In the Fujitsu Group Environmental Protection Program (Stage VI), we have set a target of reducing the impact of our main business areas on biodiversity, as evaluated by the BD Integration Index, by 3% by the end of FY 2012 compared to FY 2009. We are currently evaluating and analyzing impact trends in FY 2010. (The impact caused by the use and emissions of chemical substances is increasing, the impact caused by waste emissions is decreasing.) In FY 2011, we will strengthen our activities that reduce the impact on biodiversity while aiming to achieve a 1.5% reduction compared to FY 2009, the reference year.

## ICT and Biodiversity

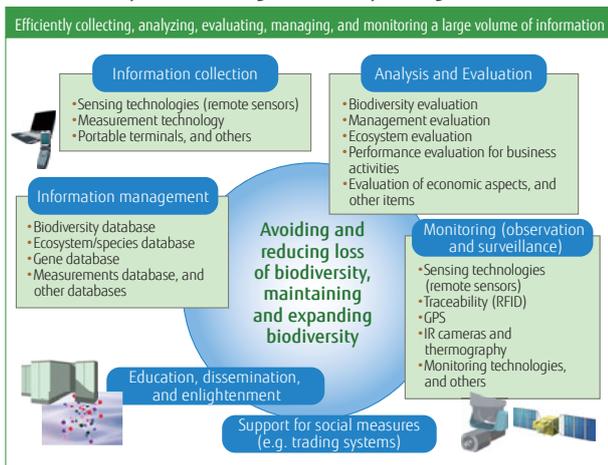
### Contributing to the Conservation of Biodiversity Using ICT

The effective use of ICT will make it possible to perform operations such as the collection and analysis/evaluation of information about living things and ecosystems, the monitoring of living things and of their habitat, and the management of information on them efficiently.

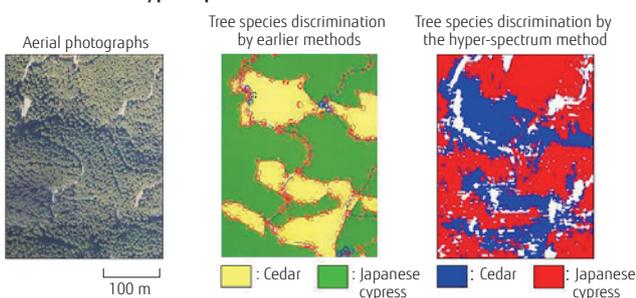
As an example of this application of ICT to biodiversity conservation, we implemented a countrywide survey of dandelion distribution using the camera function in mobile phones (see pages 33 and 34).

Fujitsu's ICT is also useful in forest management and conservation. With the number of forests in Japan that are deteriorating due to the inability to perform forestry care, it would make easier to share information and implement functions such as forest registry management, work plan management, and operations performance management by connecting the forest worksites with the offices using an information network.

### The Possibility of Conserving Biodiversity through ICT



### Comparison of Tree Species Discrimination by Earlier Methods and Hyper-Spectrum Methods



Furthermore, we are working on vegetation surveys using "hyperspectral imaging analysis technology," currently under development. This technology measures the spectrum of reflections from the ground in a helicopter or other aircraft and analyzes the distribution of vegetation over wide areas of land. By using this technology, we can, for example, survey the extent to which alien species have penetrated existing species' habitats or grasp the distribution of cedars and Japanese cypresses. We believe that this technology will significantly reduce the effort required to survey vegetation distribution, which was previously observed visually.

In the future, we will continue to use our technological abilities and know-how to contribute to avoiding or reducing the loss of biodiversity as well as maintaining and expanding biodiversity through the use of ICT.

## Contributing to Spreading these Efforts Throughout Society

### Participating in External Organizations

We participate in external organizations such as the Business and Biodiversity Initiative (B&B) and the Japan Business Initiative for Biodiversity (JBIB) and contribute to the spread of biodiversity conservation efforts throughout society.

At the ninth meeting of the Conference of the Parties (COP 9) to the Convention on Biological Diversity (CBD), B&B inaugurated the event with the signing, by more than 40 companies from around the world, of the "leadership declaration." By publishing their best practices, these companies promote the conservation of biodiversity and sustainable use. Fujitsu published the results of those efforts at a side event to CBD COP 10.

JBIB is a group in which over 30 Japanese companies from a wide range of businesses participate. Its purpose is to deploy activities that contribute to conserving biodiversity by aiming for dialogue between stakeholders and other companies based on the results of joint research. Fujitsu is involved with research activities and tool development for this effort.

## Activities on a Global Scale

### Promoting Tropical Rainforest Restoration Activities in Malaysia

To contribute to biodiversity conservation from a global perspective, we have implemented tree planting activities in Thailand, Vietnam, and Malaysia. Currently, at the Fujitsu Group Malaysia Eco Forest Park, we continuously call for volunteers to assure that the saplings planted grow into a tropical rainforest and we also perform supplementary plantings and maintenance.

Since FY 2010, we have implemented eco tours to study biodiversity while observing the actual condition of the rainforest, making the park not just a place for tropical rainforest restoration activities, but also a place for education. In FY 2010, 30 Fujitsu Group employees and family members and 19 employees of local Fujitsu Group companies, experienced forest planting and forest maintenance and also took study tours of primary forests and mangrove forests.



An eco tour in progress

## Environmental Contributions to Society

We actively promote environmental contribution activities at all Fujitsu sites, both domestic and overseas, and aim for coexistence with both the international society and local communities.

### Our Basic Approach

All employees of the Fujitsu Group recognize the importance of the global environment and, to assure that the next generation inherits a beautiful planet-wide environment, they contribute to their local community through activities based on the following three pillars: regional contributions, nature conservation and environmental education.

### Regional Contributions

To maintain local environments and to provide pleasing environments for local residents, we implement regional contribution activities, such as cleanup activities and planting activities not only at our offices, stores, and plants throughout Japan but at our overseas sites.

#### Coastal Cleanup, Fujitsu Broad Solution & Consulting, Inc.

Since a large amount of junk washes up on the Senbonhama seashore, a scenic area in Numazu City, Shizuoka Prefecture, we made "Having fun while cleaning up the coast on the Senbonhama seashore and having fun while thinking about the environment" a theme at the Fujitsu BSC Mishima Development Center and have held seashore cleanup events every year since 2001.

This effort was held on the third Sunday of June 2010, and about 50 people, including employees and their families, attended.

#### Coastal Cleanup in Hong Kong (Fujitsu Hong Kong Ltd.)

To protect the habitat of the endangered Chinese white dolphin (*Sousa chinensis*), eight employees of Fujitsu Hong Kong Ltd. participated in a cleanup activity of the seashore near the Hong Kong International Airport. We collected about 50 bags (500 kg) of plastic refuse.

### Nature Conservation

We are working on farmland maintenance, forest planting and similar activities to promote the maintenance and recovery of biodiversity and to defend nearby natural environments.

#### Popularization of Biodiversity Through Agricultural Work

We participate in the Yamanashi Corporate Farm Building System, which is promoted by Yamanashi Prefecture, with employees assisting as volunteers in the agricultural work of grape farming through to harvesting. Our aim is to have participants learn how appropriate management of agricultural land conserves biodiversity and to deepen their understanding of this while enjoying the experience of agricultural work.

This activity started in March 2010 in one part of the farm run by Yumekyo Wine Farm in Kosu City, an effort we called the Fujitsu GP2020\* Wine Farm. In it, a group of 107 employees and family members visited the farm three times and performed the vine training, placing paper covers over the ripening bunches, and helped in harvesting operations. Using the grapes that so many employees had assisted with, we completed 300 bottles of Fujitsu GP2020 wine.

\* GP2020: an abbreviation for Green Policy 2020, the Fujitsu Group's medium-term environmental vision.

### TOPICS

#### Environmental Protection Efforts Through a Golf Event – Ecosystem Survey at the Tournament Site

We carried out an ecosystem survey at the Tokyu Seven Hundred Club, where the Fujitsu Ladies golf tournament is held, and identified many plants and animals that are on the Ministry of the Environment's "Red List." The effort made it clear that this golf course contributes to the environment as a place where wild plants and animals can live and grow.



An *Epipogium* orchid  
Ministry of the Environment: Near Threatened



*Lefua echigonia*  
(a small catfish, like fish)  
Ministry of the Environment: Endangered

#### Forest Planting Activity at the Atsugi Research Laboratory

In June 2010, we held a memorial tree-planting meeting at the Atsugi Research Laboratory and invited Mr. Akira Miyawaki, a leading botanist, to attend.

We planted 80 seedlings based on potential natural vegetation and collected acorns from the three main types of tree, *Castanopsis*, *Machilus thunbergii*, and oak, and started raising them.

### Environmental Education Activities

The Fujitsu Group visits schools to give lessons, in order to make local adults and children aware of the importance of the environment. In FY 2010, we gave lessons in 56 locations, including elementary schools, junior high schools and community centers, for around 3,400 people, in which we presented the "PC 3R" exercise (in which students learn about 3R while dismantling a PC) and the My Earth card game (in which students study global environmental problems).

Also, to respond to the demand for more of these lessons, we held an instructor development course in FY 2010 in which a further 40 Fujitsu Group employees learned how to deliver the lessons. As of April 2011, 85 instructors are providing these environmental lessons at locations throughout Japan.

#### On-Site Environmental Classes that Use Fujitsu's Latest Technology

We started a new on-site environmental class for elementary school students in the sixth grade that encourages energy saving by using the Fujitsu smart power socket with built-in power sensor (see page 60) that was announced in April 2011.

The program consists of teaching the students that electricity is wasted when it is converted and that it is important to eliminate waste, and having them think about saving energy when using a PC as a familiar example. This class was developed when we participated in an education support project using ordinary citizens as teachers. The project was sponsored by Japan's Ministry of Economy, Trade and Industry.



The scene at an on-site environmental class: Measuring power consumption using a smart power socket



\* See pages 86 to 89 for more information on our efforts related to activities that contribute to society in general.

# Environmental Management

We are continuously working to improve our ISO 14001-based environmental management system and to promote group-wide environmental management.

## Fujitsu Group's Environmental Management

We have constructed an environmental management system (EMS) based on the ISO 14001 international standard and are promoting environmental improvement activities across the group. After acquiring ISO 14001 certification for our Japanese consolidated subsidiaries at the end of FY 2004, we expanded this effort to include our overseas subsidiaries and acquired global integrated certification in FY 2005.

By constructing an EMS along with a supply chain spreading across the globe, we have further strengthened our global governance. This also allows us to promote even more efficient and highly effective environmental activities; not only grasping our status of achievement of the Fujitsu Group Environmental Protection Program (Stage VI), but also collecting a wide variety of information from all Group companies such as legal compliance emergency response and environmental communication activities.

## EMS Implementation and Operational Status

We have, as of the end of FY 2010, acquired global integrated ISO 14001 certification for a total of 91 companies, including 12 overseas Group companies. In addition, our 25 overseas companies which are not production base sites are constructing and operating an EMS in line with Fujitsu Group environmental policies. In this way, we have established an environmental management structure across the whole group.

Fujitsu establishes EMS based on a matrix structure composed of a "line program" which promotes activities associated with own-business features and a "site program" which promote activities to tackle site-based issues. This ensures rapid response to top management's decision-making.

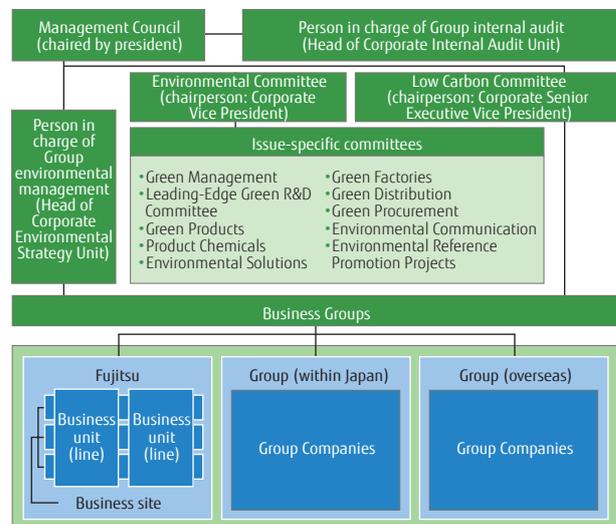
## Environmental Promotion Structure

The final decisions on environmental management are taken at meetings of the Management Council, chaired by the president. Fujitsu has two directly controlled organizations under the Management Council. One is the Environmental Committee, which reports to the Management Council and controls a wide variety of discussions related to improvements in the Environmental Protection Program, EMS systems and so forth. The other one is the Low Carbon Committee, which is made up of executives from business groups and studies companywide policies such as emissions reductions associated with business activities for global warming prevention.

The Environmental Committee sets up subcommittees to handle specific environmental issues by people from across business groups and units. In FY 2010, we inaugurated the Leading-Edge Green R&D Committee as a new subcommittee to strengthen R&D on revolutionary green ICT that will contribute to achieving a low-carbon society. This new committee promotes the development of leading-edge technologies that will boost the efficiency of ICT products and improve the environmental load reduction effects of solutions.

The Environmental Committee's deliberations are shared with the whole group and we have created a Global Environment Management Working Group (WG) under the Green Management Committee as an organization to strengthen our EMS activities through promoting an understanding of the results of the committee to encourage proactive actions. In the Global Environment Management WG, we assemble people from across the various business groups and inform them of items that we request be handled by the various divisions and group companies to unify our global information sharing.

## Structure for Environmental Activities



## Promoting the Fujitsu Group Environmental Protection Program (Stage VI) Globally

In FY 2010, as the first year of the Fujitsu Group Environmental Protection Program, we announced the program through our lines, sites and factories thoroughly. In addition, we held joint briefing sessions for environmental management controllers from group companies at eleven locations in Japan. We also created opportunities overseas to explain the program directly to local managers and environmental supervisors from



A Briefing in Europe

29 companies in four areas (the Americas, Asia/Pacific, China, and Europe) In the sessions we communicate all targets of the program while emphasizing the need to benefit customers and society, pursue internal reforms and conserve biodiversity.

In addition to promoting the Environmental Protection Program, by having each company make an effort to enhance the Fujitsu Group integrated environmental management system, Fujitsu strengthens its global environmental management system.

## Environmental Management

### Continuous Improvements to the Environmental Management System

#### Constructing Smart EMS

Fujitsu has developed original environmental management tools such as Global Environment Database System and ISO 14001 Green Management System. The Global Environment Database System enables us to consolidate a wide variety of information such as plan, performance and measures of environmental load. And ISO 14001 Green Management System consolidates risk and environmental information such as compliance to enhance and visualize our environmental management. Also, we use Join Meeting\* for remote communication in EMS operation.

\* **Join Meeting:** A web-based conferencing system

#### Efforts to Improve Environmental Performance

We have been working on creating a system to evaluate the status of target achievement, compliance and operational management to improve our environmental performance at factories.

We continuously make efforts to strengthen environmental governance by promoting the Environmental Protection Program (Stage VI), adopting ICT for smart EMS construction, and forming systems to improve environmental performance.

### Implementing Environmental Audits

#### Internal Audit Implementation and Results

Internal audits are directed by the Corporate Internal Audit Unit, which is unaffiliated with any line organization to ensure that our internal audits are fully objective and independent. The Corporate Internal Audit Unit allocates internal auditors who belong to Fujitsu or Fujitsu Group companies.

In FY 2010, we internally audited factories, offices, and other facilities at 484 locations both in Japan and overseas from July 2010 to January 2011.

For this audit, we scrutinized the trends and results with the FY 2009 internal audit and the external audit and found three major points to be focused on: (1) verification of compliance, (2) verification of the status of efforts for our Environmental Protection Program (Stage VI), and (3) verification of the status of human resources development. Also, we continuously implement mutual audits between different sales and marketing divisions, a program we have been working on since FY 2009. This promotes invigoration by reflecting other division's findings on our own activities.

As a result of these internal audits, we discovered 409 indicated matters, of which five were classified as major, 35 as minor, and 369 were observations.

One of the major matters was a serious flaw in the succession of persons in charge. About 60% of all matters arose from compliance evaluation, objectives, targets and programs, and operational control.

Operational control at subcontracting and maintenance companies was found to be inadequate. We are implementing control measures in our 2011 internal audit.

#### External Audit and Results

FY 2010 an external audit was carried out from August 2010 through January 2011. In Japan, we were audited by the Japan Audit and Certification Organization for Environment and Quality (JACO). JACO made two comments that cover group-wide activities. In addition, JACO pointed out two minor matters and made 79 observations for individual Group companies. One of the targets of the Fujitsu Group Environmental Protection Program was not well recognized. Outside Japan, we were audited by Stiftelsen Det Norske Veritas (DNV). DNV identified no matters for the Fujitsu Group as a whole, but they identified 18 minor matters and 43 observations. Some of them were inadequacies with respect to specific laws and regulations and inadequacies with respect to internal auditing. We have completed remedying these matters as of the end of FY 2010. We shared the findings throughout the Group and are confirming the status of these matters in the FY 2011 internal audit.

We started discussions with audit organizations in September 2008 about the introduction of performance evaluation (ISO 14031) in our internal audit to improve the quality of our environmental activities. During FY 2010, we established evaluation methods and will implement them, mainly in factories, starting in FY 2011.

#### Status of Environmental Compliance

While the Fujitsu Group committed no major violations of environmental laws and caused no accidents that had any major impact on the environment in FY 2010, there were 15 events in which laws were violated and our own standards were not met and delays in appointing a person to be in charge. Most of these were inadequacies in operating management procedure or documentation, such as (1) water quality standard values being exceeded (temporary BOD\* excess in factory effluents), (2) insufficient verification of items associated with solid waste processing, or (3) delays in setting an assignee (delays in reporting an assignment).

At the same time as strengthening our reeducation efforts across the whole Group, in moving forward to prevent reoccurrences, we will aim at thorough reporting in constructing new waste processing systems at office sites.

\* **BOD:** Biochemical oxygen demand.

## Internal Education and Enlightenment Activities Our Environmental Education System

To ensure that our environmental activities take firm root, the Fujitsu Group believes it essential to inculcate and raise the environmental awareness of each and every employee to a point where it links to actual practice. To this end, the Group has been carrying out environmental education and enlightenment training since 1995, based on the system described below.

In addition to having all of our employees undertake environmental e-learning once every three years to acquire a basic understanding of environmental issues, environmental education also forms a part of the general training given to new entrants when they join the company and to ordinary employees, middle managers and senior executives whenever they are promoted. On top of this, customized environmental training is also delivered to individual areas of the business such as sales, systems engineering (SE), design, quality assurance and production. We are implementing facilities management education and internal auditor education as professional education for employees in charge of work related to the environment.

### Fujitsu's Environmental Education System

New entrants	Ordinary employees	Middle managers	Senior executives
Environmental e-learning (triennial)			
Environmental Leader Course (biannual)			
Function-specific training (Sales, SE, Design, Production) (triennial)			
Level-specific training (annual)	Level-specific training (annual)	Level-specific training (annual)	Level-specific training (ad-hoc)
Environment Month (lectures, seminars, workshops, etc.) (annual)			
Information provided via intranet (updated as required)			
Environmental awareness survey (annual)			

\* See page 75 for details of our efforts in human resources development overall.

### Implementing Environmental e-Learning

Once every three years, we implement an environmental e-learning program for all Fujitsu Group employees. This program is aimed at publicizing, understanding, and implementing the Fujitsu Group Environmental Protection Program and to carry out environmental protection activities that conform to ISO 14001.

In FY 2010, we implemented an environmental e-learning program whose main theme was informing people of the Fujitsu Group Environmental Protection Program (Stage VI), which started in FY 2010, and continuation of ISO 14001 certification.



Environmental e-learning screen

### Training Workshop for Environmental Leaders

We hold workshops for environmental leaders from each site to foster corporate abilities and know-how. In FY 2010, the conservation of biodiversity was the theme, and the participants brainstormed on what biodiversity conservation activities they themselves should work on.

In April 2010, we held a two-day/one-night training workshop for supervisors at Nakatosa Town in Kochi Prefecture, where the Fujitsu Group Nakatosa Kuroshio Forest is located, for those in charge of biodiversity conservation and enlightenment activities at branches and group companies. This workshop increased the participants' depth of understanding of biodiversity through river water quality surveys and other exercises.

In September 2010, we also held a supervisors workshop at Furano City in Hokkaido Prefecture. At this workshop, we carried out a forest recovery activity in Hokkaido's vast outdoors and implemented an environmental education program called Furano Nature School for participants to experience nature with all their senses and think deeply about the environment. In addition to studying at this environmental education facility, they participated in a tree-planting effort.



River water quality survey activity



Furano Nature School environmental education program

### In-House Award Scheme

#### Environmental Contribution Award and Environment Contest

To raise the environmental awareness of employees in all Fujitsu Group companies, we have operated an Environmental Contribution Awards scheme and an Environmental Contest (with a photo division and an eco-life division), open to all employees, every year since 1995. Since FY 2002, Fujitsu's president has presented the top Environmental Contribution Award at the company founding anniversary celebration held in June every year.

#### Unique Award System in the Fujitsu Solutions Business Group

In FY 2008 the Fujitsu Solutions Business Group independently established an awards scheme to help even more customers utilize our outstanding environmental solutions. Of these, the Special Environmental Award, which is given to organizations that perform outstanding activities, is awarded at the Solutions Sales Promotion Meeting, held in April each year.

# Environmental Communication

At the same time as working to achieve bidirectional communication with all our stakeholders including overseas stakeholders, we aim at strengthening our environmental management through participation in external groups.

## Promoting Environmental Communication Domestically and Overseas

We recognize the importance of communication with our stakeholders and take a wide range of opportunities for proactive communication, including issuing social and environmental responsibility reports, disclosing information on our website, conducting advertising campaigns, and exhibiting at exhibitions and trade shows in Japan and overseas. We also work to improve our daily environmental protection activities through bidirectional communication.



International Greentech and Eco Products Exhibition and Conference Malaysia (IGEM) 2010 (Kuala Lumpur, Malaysia)



Eco Products 2010, Tokyo

### Main Conventions in which Fujitsu Participated in FY 2010

Convention	Location	Date
Japan		
N-expo 2010 Tokyo	Tokyo	May 2010
Interop TOKYO 2010	Makuhari	June 2010
Hamamatsu Environmental Technology Convention	Hamamatsu, Shizuoka	July 2010
The Best 100 Surprising Ecological Items of 2010	Kyoto and Tokyo	August 2010
Eco-Life Yamagata	Yamagata	October 2010
CEATEC JAPAN 2010	Makuhari	October 2010
Ishikawa Dream Future Expo	Kanazawa	October 2010
Iwate Environmental Kingdom	Morioka	November 2010
Eco Products 2010	Tokyo	December 2010
Kawasaki International Eco-Tech Fair 2011	Kawasaki	February 2011
Overseas		
International Greentech & Eco Products Exhibition & Conference Malaysia 2010	Malaysia	October 2010
7th Eco-products International Fair	India	February 2011

## Promoting Environmental Management Through External Groups

We participate in international external groups and promote international standardization of products and services that contribute to environmental protection. At the same time as improving the international competitiveness of Fujitsu Group products and services and increasing our business opportunities, these efforts also aim at strengthening our environmental management.

### Helping to Establish Global Standards

We are promoting standardization for methods for evaluating environmental burden reduction by the use of ICT solutions through our participation in the International Telecommunication Union (ITU), the ICT for Energy Efficiency Forum (ICT4EE), and the Green IT Promotion Council. Our aim is to see standardization encourage the widespread adoption of Green ICT and for this to lead to reduced environmental burdens globally.

In FY 2010, we submitted to the ITU-T\* working group on ICT and climate change the results of the Ministry of Internal Affairs and Communications' FY 2009 "data center experimental demonstration addressing the characteristics of 'cold spots,' regions characterized by lower ambient temperatures," which was positioned as an effort promoting ICT to achieve a low-carbon society, and we incorporated our data center best practices in that recommendation.

\* ITU-T: The Telecommunication Standardization Sector. ITU-T is in charge of standardization measures in the communications field, in the International Telecommunication Union. If a new standard is recognized, it is published as an "ITU-T Recommendation."



### Outside Awards Received by the Fujitsu Group and its Employees in FY 2010

Award	Date	Sponsor	Reason for Award
ITU-AJ Awards International Activities Encouragement Award	May 2010	ITU Association of Japan	Working towards agreement within Japan, and promoting the Japanese proposal to the ITU concerning ICT and environment change
Japan Electronics and Information Technology Industries Association President's Award	May 2010	Japan Electronics and Information Technology Industries Association	Efforts on international standardization activities in the environmentally conscious design area and contributions to strengthening Japan's international competitiveness
Information Technology Award Achievement Award	June 2010	Telecommunication Technology Committee (ITC)	Promotion of upstream activities related to ICT and climate change
Green IT Award 2010 The Minister of Economy, Trade and Industry Award	October 2010	Green IT Promotion Council	Semiconductor laser using quantum dots that achieves significant energy savings in IT equipment
12th Green Purchasing Award Grand Prize	October 2010	Green Purchasing Network (GNP)	Efforts to conserve biodiversity in the Fujitsu Group Procurement Division
The Green Grid Most Improved Data Center Energy Efficiency Award Performance Award	October 2010	The Green Grid, Japan office/DatacenterDynamics	Working group on saving energy and continuous energy trend monitoring for data centers
2010 Environment Minister's Award to Distinguished Organization of Merit in Promoting the Creation of a Sustainable Society	November 2010	Ministry of the Environment	Establishing medium-term goals for reducing the amount of solid waste emitted from business sites, promoting achievement of those goals in a planned way, and achieving significant reductions
7th Life Cycle Assessment Society of Japan Awards Incentive Award	December 2010	Life Cycle Assessment Society of Japan (ILCA)	Implementation of LCA in product development and production activities
2010 Minister of the Environment Award for the Prevention of Global Warming Technology Introduction and Diffusion	December 2010	Ministry of the Environment	Modal shift based transportation CO <sub>2</sub> emissions reduction activities/ Significant reduction of energy usage in ICT equipment by building private clouds at leading-edge universities
Low CO <sub>2</sub> Kawasaki Pilot Brand '10	February 2011	Kawasaki City	SPARC Enterprise M Series/Facility Cube