Priority 2

Protecting the Global Environment

Clean air and water, rich soil and forests, and other natural gifts are vital to our existence and economic activity.
However, there is global concern about the impact on health and ecosystems from air pollution and destruction of the natural environment.
The Fujitsu Group is stepping up efforts to leverage ICT to reduce environmental impact and conserve biodiversity to ensure that our children inherit a beautiful planet.

Environmental Management at the Fujitsu Group

The Fujitsu Group is well aware of its mission as a global ICT organization. We are dedicated to sustainable growth and progress with our customers and society as we seek more ways to reduce our impact on the environment.

Leveraging the power of ICT to contribute to sustainable growth

Significant global warming and declining biodiversity are just two of many serious environmental issues that continue to escalate on a global scale. Furthermore, with the world's population now more than 7 billion, there are rising concerns about a shortage of food, water, energy and other resources. The Fujitsu Group is determined to play a role in achieving a prosperous society that is capable of sustainable growth. Enacting the necessary reforms will be impossible without the power of ICT.

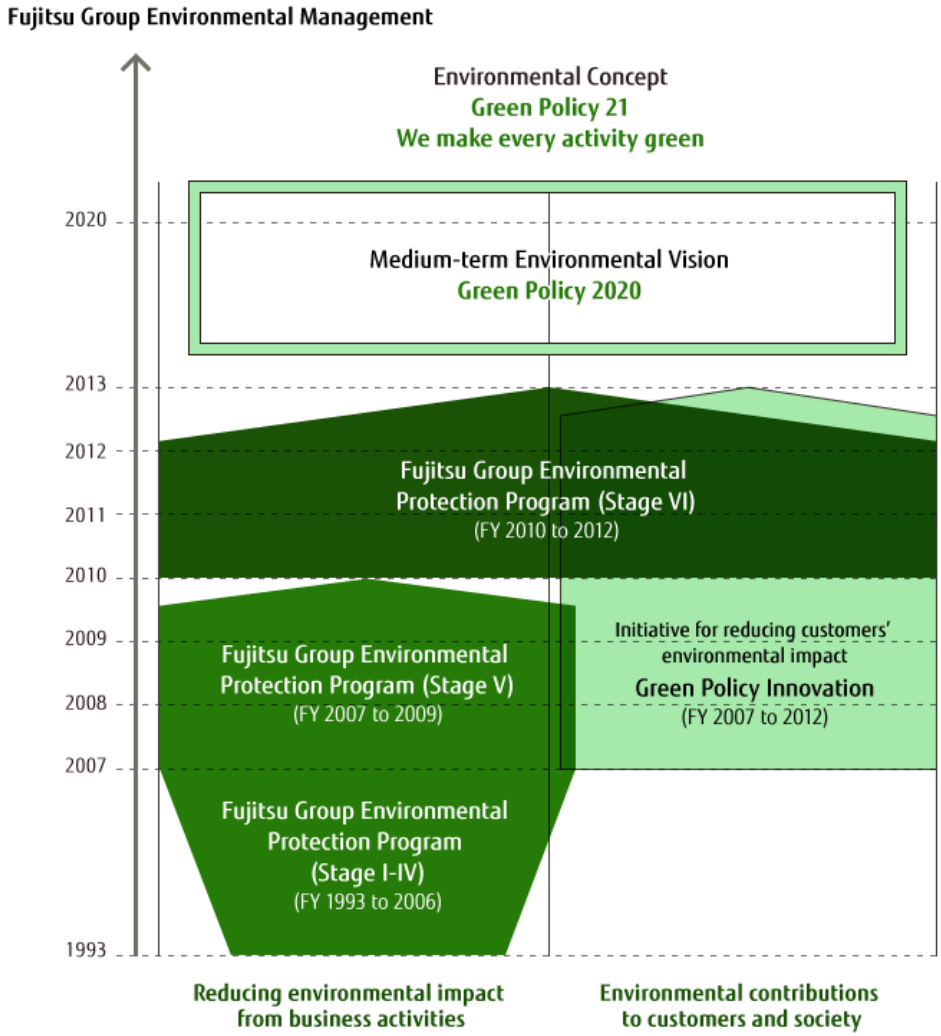
Since its inception in 1935, the Fujitsu Group has placed priority on actively protecting the environment based on the principle of "operating in harmony with nature." Today, environmental problems are more serious than ever. Dealing with these issues will require reducing our own environmental impact as well as greatly lowering the burden on the environment from society as a whole. This is why we are extensively pursuing business operations that have an even smaller environmental impact. In addition, we will be supplying eco-friendly products and ICT solutions that can make a large contribution to making the activities of our customers and society more environmentally compatible. Basically, this stance entails incorporating the use of Green ICT at an even faster pace.

Green ICT consists of two elements. The first is using ICT solutions to reduce the impact on the environment. These solutions offer benefits that include using energy more efficiently, producing and consuming goods more efficiently, reducing movements of people and goods, and using sensors to measure and predict changes in the environment. The second is reducing the environmental impact of ICT devices. This is why we focus on supplying environmental products that use less energy and fewer resources. Developing and building highly energy-efficient datacenters is another part of this aspect of Green ICT.

The Fujitsu Group is committed to leveraging its expertise in creating technologies to help resolve global environmental issues through the power of ICT. By doing so, we want to contribute to sustainable growth and progress for our customers and the world.

Environmental Management Based on the FUJITSU Way

The Fujitsu Group implements environmental management in a systematic and sustained manner. Our efforts reflect the goal of "in all our actions, we protect the environment and contribute to society." This commitment is part of the Corporate Values enshrined in the FUJITSU Way, a corporate philosophy with guiding principles for the Company and its employees.



We have established an environmental concept called Green Policy 21 for the purpose of making everyone at the Fujitsu Group aware of our stance regarding environmental activities and to promote this stance in our daily business practices. Global environmental activities called Green Policy Earth are the core of this environmental concept. Initiatives to accomplish our goals are Green Policy Products, Green Policy Factories and Green Policy Solutions. Furthermore, we position Green Policy Management as the mechanism that supports all of these activities.

- Environmental Concept "Green Policy 21"

Green Policy 2020 is a medium-term environmental vision that defines the roles and objectives of the Fujitsu Group between now and 2020. There are three goals: to benefit our customers and society as a whole, to pursue internal reforms, and to preserve biodiversity. We will create technologies and solutions while cooperating with many other organizations and reform our own activities to make Fujitsu a low-carbon corporate group, which is another objective of this policy. By implementing such measures, we will play a part in achieving a prosperous, low-carbon society.

Three Green Policy 2020 Goals

1. Benefit our customers and society as a whole
   It is the goal of the Fujitsu Group to reduce carbon emissions in Japan by 30 million tons annually by 2020 through the provision of advanced, energy-efficient technologies and solutions, thus contributing to lowering worldwide greenhouse gas emissions, which need to peak by 2020 at the latest in order to achieve the 2050 goal declared by the G8.

2. Pursue internal reforms
   By 2020, Fujitsu seeks to offer world-class overall energy efficiency in all of its business areas (software and services, hardware, electronic devices, others). Fujitsu will also set up a new organization to promote low-carbon initiatives.
3. Preserve biodiversity
   Fujitsu plans to address every area of the Leadership Declaration of the Business and Biodiversity Initiative, with specific initiatives to get underway before 2020.

- Medium-Term Environmental Vision "Green Policy 2020"

As one step toward reaching the goals of this medium-term environmental vision, the Fujitsu Group established the Fujitsu Group Environmental Protection Program (Stage VI) that covers the three-year period from FY 2010 to FY 2012. We are also making progress with Green Policy Innovation, a project that aims to lower the environmental burden of our customers' activities through the provision of Green ICT. The goal of this project is to contribute to cutting global CO2 emissions by at least 15 million tons during the four-year period from FY 2009 to FY 2012.

- Targets and Results for the Fujitsu Group Environmental Protection Program (Stage VI)
- Environmental Burden Reduction Project by Green IT, Green Policy Innovation

The Green Policy Innovation Logo

The Fujitsu Group started its Green ICT project, called Green Policy Innovation, in December 2007. We began using the Green Policy Innovation Logo in November 2008 so that customers can easily identify products that are part of this project.

The Green Policy Innovation Logo

Only products that fulfill specific requirements may display this symbol. One category is "Green" products that meet our strict environmental standards for recycling, energy conservation, environmentally responsible materials and other criteria. Another is "Super Green" products, which achieve the highest levels of environmentally compatible characteristics among all Fujitsu Group products. We also use this symbol for Environmentally Conscious Solutions that can lower customers' CO2 emissions by at least 15%.

Environmental Emblem

This Environmental Emblem symbolizing the stance of the Fujitsu Group with respect to the environment was unveiled in November 1994. The emblem consists of the Earth, a pair of eyes, and an infinity symbol, which is used as part of the Fujitsu Logo. The meaning is that the Fujitsu Group will always conduct its business caring for the Earth.

The Environmental Emblem can be found, among other places, on Fujitsu Group Sustainability Reports and in association with Group environmental and social contribution activities.

Environmental Emblem

First IT Services Company to Garner "Eco-First" Credentials

In September 2010, Fujitsu became the first IT services company to be certified under Japan's Ministry of the Environment's "Eco-First Program." Under the program, industry-leading companies pledge to fulfill their environmental commitments in areas such as countering global warming and protecting biodiversity to the Minister of the Environment as a way to further promote their environmental preservation initiatives.

First IT Services Company to Garner "Eco-First" Credentials

Reinforcing Environmental Management by Utilizing ICT

Fujitsu has made environmental management even more powerful by building an Environmental Management Dashboard, a centralized display of information derived from the collection and analysis of data from a variety of sources.

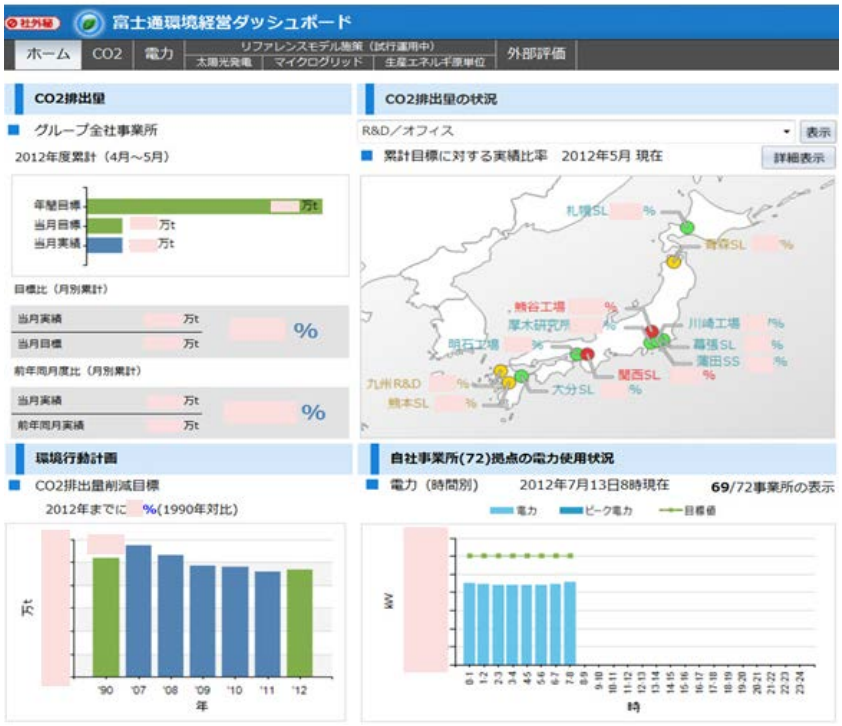
Establishment and Use of the Environmental Management Dashboard

As demands for protecting the environment continue to rise, companies are faced with the increasingly significant task of achieving environmental management that can support both the growth of business activities and reduce the environmental impact of such activities. The Fujitsu Group has established an Environmental Management Dashboard to function as a support base for environmental management. Its centralized portal screen displays information derived from the collection and analysis of a multitude of environmental data in real time. Senior executives, department managers and site managers, depending on their needs, can use the dashboard to access this information and utilize it in making their own decisions. We believe this single, integrated display provides for stronger environmental management.

The dashboard can show data ranging from the entire Fujitsu Group to individual business sites, departments, buildings and floors. Users can access visualized data for the types and amounts of energy used, total CO2 emissions, CO2 emissions per employee or unit of floor area, year-on-year comparisons broken down by month, and various other information on a real-time basis. Examples of other capabilities are monthly performance reports in relation to the Fujitsu Group Environmental Protection Program (Stage VI) and an alert function. Information on the dashboard is valuable in enabling executives and managers in charge of energy management to make decisions and judgments. The dashboard is also an effective tool for encouraging all employees to take action following their own autonomous initiatives to protect the environment.

In response to the Great East Japan Earthquake, the Japanese government has asked large electric power users to reduce their consumption. By utilizing the Environmental Management Dashboard, the Fujitsu Group succeeded in cutting electricity use to well below the target level. We are using this system for more than our own environmental management-the dashboard is intended to serve as an environmental reference model that enables customers to incorporate our know-how into their own environmental management. We plan to use this model to provide our customers with a variety of environmental solutions.

A sample Environmental Management Dashboard screen display



Looking Back on FY 2010 Environmental Activities

The global population has topped 7 billion, and concerns about resource depletion and growing environmental stress continue to spread. At the same time, ICT has come a long way, with impressive computing power and high-speed networks, and its applications know no bounds. The Fujitsu Group looks to wield the power of ICT to help solve global environmental problems.

Corporate Executive Advisor (Environmental Strategy) Atsuhisa Takahashi

Head of Unit, Corporate Environmental Strategy Unit Minoru Takeno

The Great East Japan Earthquake in 2011 sharply changed energy awareness and values in Japan, and caused companies and households to work hard to conserve energy. The Fujitsu Group also deployed measures to save electricity throughout its domestic locations. We achieved our conservation targets by using the Environmental Management Dashboard, a tool developed in-house, to ascertain real-time electricity use.

As for the Fujitsu Group Environmental Protection Program (Stage VI), we met all of the targets for the program's second year, FY 2011, including the four items we upwardly revised. We will work to ensure that Fujitsu also achieves the goals for the program's final year, FY 2012.

Further, we are taking on the challenge of deploying ICT in new fields, with an eye to a sustainable global environment. Our wide-ranging activities include employing multi-sensing network technology to conserve biodiversity and help revitalize agriculture and contributing to the creation of environmentally friendly cities.

The Fujitsu Group will continue efforts to resolve resource, energy, and other global environmental problems through our cutting-edge Green ICT.

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

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 2011 Targets Achieved

We achieved all of the targets set in the Fujitsu Group Environmental Protection Program (Stage VI) for FY 2011. And, we achieved our planned targets for areas where we had revised targets upward for FY 2011; namely, advanced green ICT R&D, environmental efficiency factors, renewable energy, and CO2 reduction in distribution and transportation. Going forward, we will continue to use the PDCA cycle and work toward achieving our FY 2012 targets as well, which are our final fiscal-yearly targets for Stage VI of the program.

Benefitting customers and society

Strengthening advanced green ICT R&D

Category	Performance (FY 2010)	Targets (FY 2011)	Performance (FY 2011)	Targets (FY 2012)
Strengthening advanced green ICT R&D				
Develop technologies for next-generation datacenters and networking that will at least double overall efficiency of ICT products by end of FY 2012.	1.3 times	1.5 times	1.5 times	2 times
By end of FY 2012, more than 70% of all technology developed will be solutions for reducing burden on the environment.	58%	60%	61%	70%

Improving environmental value of products and services, and enhancing development and delivery of green ICT

Category	Performance (FY 2010)	Targets (FY 2011)	Performance (FY 2011)	Targets (FY 2012)
Develop and deliver green ICT to contribute to customers and society				
Provide green ICT that will reduce cumulative CO2 emissions by 15 million tons or more over the FY 2009-12 period.	5.60 million tons	9.55 million tons	9.98 million tons	15 million tons or more
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.	17%	20% or more	33%	30% or more
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 FY 2008 value by end of FY 2012.*1	Raise to 3.2	Raise to 3.5	Raise to 4.1	Raise to 4.0
Promote product recycling				
Sustain 90% resource reuse rate of business ICT equipment globally at Fujitsu recycling centers.	93.3%	Sustain 90%	94.1%	Sustain 90%
Develop and provide environmental solutions				
Promote development and provision of environmental solutions in all areas, including industry, transport, business, households, and energy conversion sectors.	Departmental and regional coverage rate: 78%	Departmental and regional coverage rate: 85%	Departmental and regional coverage rate: 89%	Departmental and regional coverage rate: 100%
Expand provision of environmental solutions in major regions, including Japan, Europe, the Americas, and Asia-Pacific.				

Pursuing internal reforms

Enhancing efforts to reduce the Fujitsu Group's environmental footprint

Category	Performance (FY 2010)	Targets (FY 2011)	Performance (FY 2011)	Targets (FY 2012)
Reduce greenhouse gas emissions				
Reduce total greenhouse gas emissions associated with manufacturing globally to 6% below FY 1990 levels by end of FY 2012 (CO2: 5% reduction, other greenhouse gases: 20% reduction).	11.7% reduction	3% reduction	18.2% reduction	6% reduction
Reduce greenhouse gas emissions (renewable energy)				
Increase use of renewable energy sources to 10 times FY 2007 levels by end of FY 2012.*1	4.8 times	10 times	11 times	10 times
Reduce CO2 in transport and distribution				
Reduce CO2 emissions from domestic transport to 15% below FY 2008 levels by end of FY 2012.*1	18% reduction	16% reduction	24% reduction	15% reduction
Promote business partners' greenhouse gas reduction				
Promote procurement from business partners that limit or reduce greenhouse gas emissions.	62.7%	80%	98.4%	100%
Factory improvements (chemicals)				
Reduce output of priority chemicals to 10% below FY 2007 levels by end of FY 2012.	48% reduction	7% reduction	60% reduction	10% reduction
Factory improvements (waste)				
Reduce waste generation to 20% below FY 2007 levels by end of FY 2012.	20.1% reduction	13% reduction	27% reduction	20% reduction
Maintain zero waste emissions at factories in Japan.	Status maintained	Status maintained	Status maintained	Status maintained
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 (completed)	Japan: 70% Internationally: Draft evaluation standards	Japan: 80% Internationally: completed draft evaluation standards	Japan: 100% Internationally: Trial implementation

Strengthening environmental governance

Category	Performance (FY 2010)	Targets (FY 2011)	Performance (FY 2011)	Targets (FY 2012)
Continuously improve globally integrated environmental management systems				
Promote further ICT deployment for environmental management, build smart environmental management systems.	Trial implementation	Block application rate: 50%	Block application rate: 60%	Block application rate: 75%
To improve environmental performance, by end of FY 2012 we intend to apply a framework of assessments for the extent of target achievement and a compliance situation of 100% in regard to the Group's main domestic production companies.	Performance assessment procedures established	Trial implementation	Trial implementation	Expand as far as domestic manufacturing group companies
Promote environmental management through communications with stakeholders				
Promote environmental communication at all levels to improve environmental management	Both internal and external information dissemination improved	Improved communication of environmental information	Both internal and external information dissemination improved	Improved communication of environmental information

Promoting environmental contributions to society

Category	Performance (FY 2010)	Targets (FY 2011)	Performance (FY 2011)	Targets (FY 2012)
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.	Network implementation	Management of the domestic network Management of the international network	Management of the domestic network Management of the international network	Management of the domestic network Management of the international network
Sustain environmental social contributions activities around the world and promote activities that will contribute more to local communities through utilizing Act-Local-System.	Japan: Implemented at all business sites Internationally: Implemented at 54% of business sites	Japan: Once a year Internationally: Once every three years	Japan: Implemented at all business sites Internationally: Implemented at 65% of business sites	Japan: Once a year Internationally: Once every three years

Preserving biodiversity

Promoting efforts to preserve biodiversity

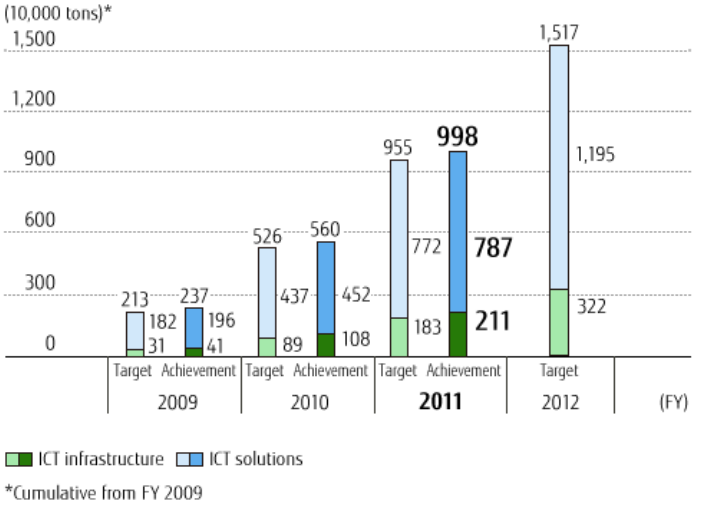
Category	Performance (FY 2010)	Targets (FY 2011)	Performance (FY 2011)	Targets (FY 2012)
Reduce impact of company's operations on biodiversity				
Develop numerical indicators to measure impact of operations on biodiversity and build system to expand contribution of ICT to reducing that impact.	Completion of numerical indicator development	1.5% reduction in level of impact (in main business areas) compared to FY 2009 as evaluated by BD integration index	4.6% reduction in level of impact (in main business areas) compared to FY 2009 as evaluated by BD integration index	3% reduction in level of impact (in main business areas) compared to FY 2009 as evaluated by BD integration index
Promote procurement from business partners that work to preserve biodiversity.	60.9%	80%	99.2%	100%
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.	Survey implementation	Pilot project based on survey results	Pilot project based on survey results	Development at main business sites
Conduct biodiversity preservation/education programs in all offices by end of FY 2012.	Japan: Implemented at all business sites Internationally: Implemented at 30% of business sites	Japan: Once a year Internationally: Once every three years	Japan: Implemented at all business sites Internationally: Implemented at 41% of business sites	Japan: Once a year Internationally: Once every three years

*1:
Target revised upward from FY 2011

Green Policy Innovation-Achievements in Reducing CO2 Emissions

Since FY 2007, the Fujitsu Group has been promoting Green Policy Innovation, a project to reduce environmental burden through Green ICT. In FY 2009, Fujitsu set a global target of cutting CO2 emissions by more than 15 million tons over a four-year period from FY 2009 to 2012. By FY 2011, we exceeded our targets and contributed to a total CO2 reduction of 9.98 million tons in aggregate, comprising 2.11 million tons from offering Green Policy Products (eco-friendly ICT infrastructure products), and 7.87 million tons from providing Green Policy Solutions, which are ICT solutions that contribute to reducing environmental burdens.

CO_2 Reduction Targets and Achievements under Green Policy Innovation



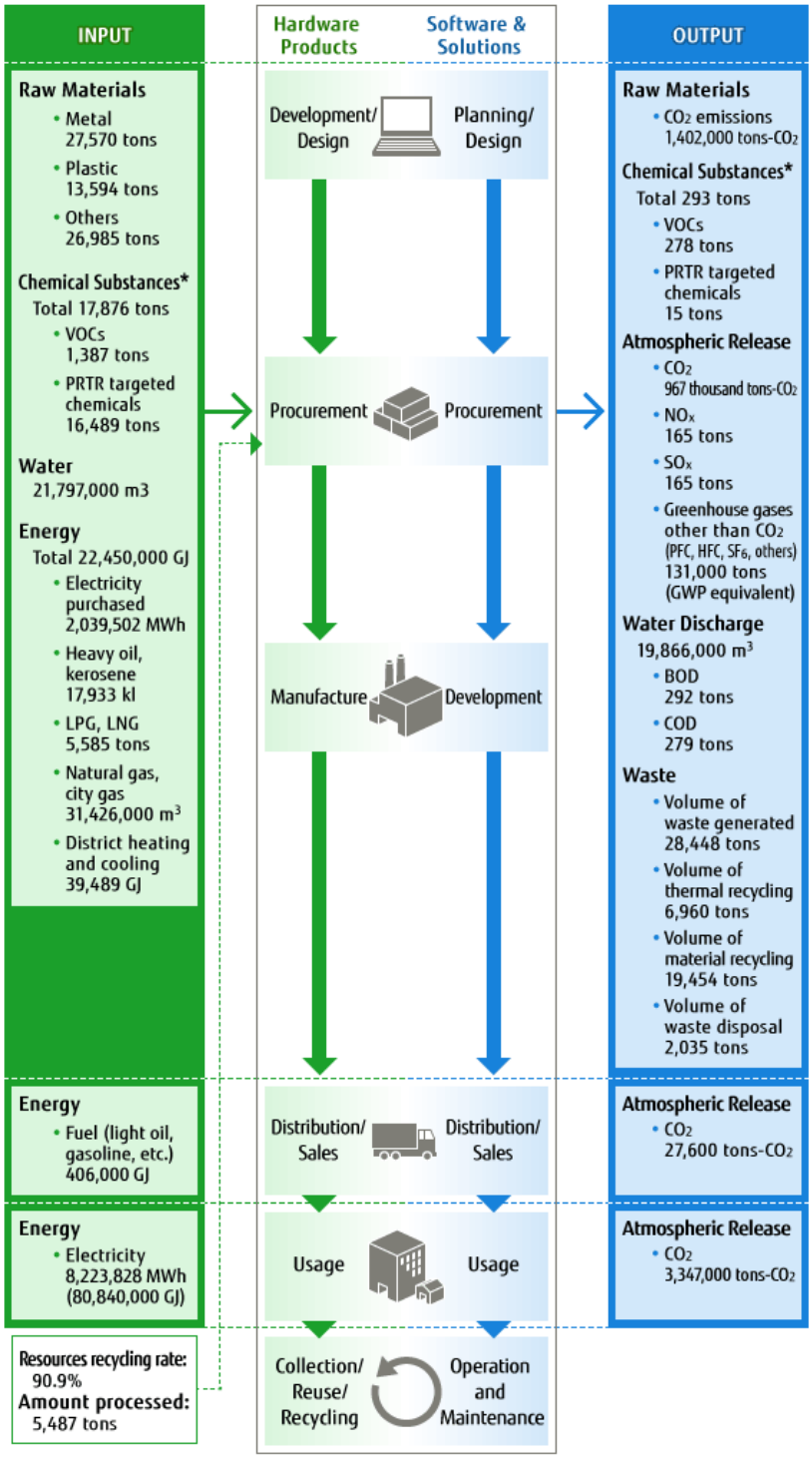
*Cumulative from FY 2009

Operating Activities and Environmental Load (FY2011)

We promote environmentally friendly business activities through overall quantitative assessment of our environmental burden.

FY 2011 Performance

Material Balance



*Substances that qualify as both a PRTR targeted chemical and a VOC are included under "VOCs" only.

Calculation Methods

Calculation Methods (INPUT)

Development/Planning & Design Procurement Manufacturing/Development	**Raw Materials**	Material inputs to our major products*1 shipped in FY 2011 (raw materials per unit for each product times the number of units shipped in FY 2011)
	Chemical Substances	PRTR: Volume of PRTR-targeted substances handled by plants/sites in FY 2011 VOC: Volume of substances subject to VOC emissions restrictions stipulated by the four electric and electronics associations handled by plants/sites in FY 2011
	Water	Volume used by plants/sites in FY 2011
	Energy	Electricity, oil and gas consumed by plants/sites in FY 2011
Distribution / Sales	**Energy**	Energy consumption in transportation in FY 2011
Usage	**Energy**	Electricity consumption by major products*1 shipped in FY 2011 (Assumed hours of use per product x age-based electricity consumption x the number of units shipped in FY 2011)
Collection / Reuse / Recycling		The weight ratio of recycled parts and resources with respect to the processing volume of post-use products in Japan 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.

Calculation Methods (OUTPUT)

Development/Planning & Design Procurement Manufacturing/Development	**Raw Materials**	Material inputs to our major products*1 shipped in FY 2011 (per-unit volume of CO2 emitted from mining the resource until it becomes a raw material for each product times the number of units shipped in FY 2011)
	Chemical Substances	PRTR: Volume of PRTR-targeted substances discharged in FY2011. Calculated by measuring the concentration of substances passing through plants' drains and exhaust ports in FY 2011 and multiplying the total volume discharged (nickel compounds, manganese compounds, etc.) or total volume emitted (xylene, toluene, etc.), or calculated based on the chemical substance balance (xylene and toluene). VOC: Emission amounts of the substances subject to VOC emissions restrictions stipulated by the four electric and electronics associations for factories and business sites for FY 2011
	Atmospheric Release	CO2: CO2 discharge volume associated with energy consumption by plants/sites in FY 2011 (Energy consumption times CO2 conversion factor) NOx, SOx: Calculated from concentrations in gases discharged from vents (boilers, etc.) by plants/offices in FY 2011 Greenhouse gases other than CO2: Discharge volume of process gases used in four semiconductor plants in FY 2011 (Calculated by formulas such as <volume of gas used> x <ratio consumed in reactions> x <detoxification ratio>)
	Water Discharge	Wastewater volume discharged by plants/sites into sewerage or rivers in FY 2011 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 2011 Volume of Waste Disposal: The volume of landfill disposal and simple incineration by plants/sites in FY 2011 (including waste which is not a zero emission target)
Distribution/Sales	**Atmospheric Release**	The total volume of CO2 emissions in FY 2011, 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 CO2 emissions during use of major products*1 shipped in FY 2011 (Amount of energy consumed x CO2 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 2011)

*1 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.

FY 2011 Environmental Accounting Results (As of July 31, 2012)

To promote environmental management, the Fujitsu Group introduced environmental accounting in FY 1998. We evaluate the efficiency of our environmental protection activities by monitoring the required costs and benefits of these activities. Through this process, we have clarified issues and promoted sharing of the results.

Purpose of Introducing an Environmental Accounting System

- To clarify our corporate stance through disclosure of information to stakeholders
- To implement long-term, continuous environmental measures
- To raise the efficiency of investment in environmental protection measures
- To energize environmental protection activities

Basic Environmental Accounting Elements

- Applicable period
  April 1, 2011 to March 31, 2012
- Accounting coverage
  Fujitsu and its major consolidated subsidiaries worldwide *1
- Calculation basis for environmental protection costs
  - **Accounting method for depreciation and amortization**: Depreciation and amortization expenses for investments are included in expenses using straight line depreciation (with no residual value) based on a useful life of 5 years. The useful life of five years was chosen based on the average length of the actual period from the introduction of environmental facilities to the implementation of repairs and upgrades.
  - **Basis for recording composite costs**: In regard to composite costs in which environmental protection costs are coupled with other costs, the Fujitsu Group records only the portion corresponding to environmental protection in conformance with the Environmental Accounting Guidelines 2005 issued by the Ministry of Environment.
- Calculation basis for the economic benefits of environmental protection measures
  - **Scope of benefits in environmental accounting**: The Fujitsu Group records the actual benefits and estimated benefits (risk avoidance benefit and deemed benefit) of reducing environmental impact related to the following items.
    - Benefit of reducing the environmental impact related to resource usage in business activities
    - Benefit of reducing the environmental impact related to environmental loads and waste emissions resulting from business activities
    - Benefit of reducing the environmental impact related to goods and services produced by business activities
    - Benefit of reducing the environmental impact related to transportation and other activities
  - **Investment benefit materialization period and basis**: The accounting period for actual economic benefits has been aligned with the depreciation and amortization period for investments (60 months). However, the accounting period for economic benefits derived from reducing personnel costs related to the environmental management system is 12 months, in line with the main thrust of the environmental management system, which is reviewed every year. With regard to estimated economic benefits, the accounting period for economic benefits derived from capital investment is the same as the depreciation and amortization period (60 months) for actual economic benefits. Benefits corresponding to a given fiscal year, such as the amount of contribution to environmental protection and the avoidance of operational losses, are recorded only for that fiscal year. The basis for accounting for economic benefits is as follows.
    - Contribution of environmental protection activities to added value derived from production activities
      The Fujitsu Group recognizes support provided by environmental protection activities to production activities as an economic benefit. Accordingly, the amount of contribution is determined by multiplying the added value derived from production activities by the ratio of the maintenance and operation cost for environmental protection facilities to the total facility cost of each site.
      Contribution = Added value x Maintenance and operation cost for environmental protection facilities / total facility cost
    - Avoidance of operational loss at business sites due to non-compliance with laws and regulations
      The Fujitsu Group recognizes the avoidance of operational loss as the amount of loss that is avoided in the event of the materialization of risk arising from neglect to make upfront investments needed to comply with laws and regulations. The number of operational loss days is determined based on the size of investment related to the environment, but shall not exceed three days.

Benefit = Added value / Operational days x Operational loss days

- Benefit of public relations activities
  This benefit is calculated by converting publicity efforts related to environmental protection activities in newspapers, magazines and TV into an advertising cost.
  Benefit=Advertising cost of newspapers, magazines and TV x Number of advertisements ran and programs broadcast
- R&D benefit
  The Fujitsu Group calculates the amount of additional earnings resulting from the contribution of R&D achievements for environmental protection purposes, such as Super Green Products and environmental solutions.

*1 Fujitsu's major consolidated subsidiaries worldwide:
Fujitsu Isotec Limited, FUJITSU IT PRODUCTS LIMITED, FUJITSU I-NETWORK SYSTEMS LIMITED, Fujitsu Integrated Microtechnologies Limited., FUJITSU INTERCONECT TECHNOLOGIES LIMITED, FUJITSU VLSI LIMITED, ECOLITY SERVICE LIMITED, FDK CORPORATION, Fujitsu Optical Components Limited, FUJITSU KASEI LIMIED, FUJITSU LABORATORIES LTD., FUJITSU COMPONENT LIMITED, Shimane Fujitsu Limited, FUJITSU PERIPHERALS LIMITED, SHIN-ETSU FUJITSU LIMITED, SHINKO ELECTRIC INDUSTRIES CO. LTD., FUJITSU SEMICONDUCTOR LIMITED, FUJITSU SEMICONDUCTOR TECHNOLOGY INC., FUJITSU TELECOM NETWORKS LIMITED, FUJITSU TEN LIMITED, TOCHIGI FUJITSU TEN LIMITED, Transtron Inc., PFU LIMITED, Fujitsu Frontech Limited, Fujitsu Mobile-phone Products Limited, FUJITSU WIRELESS SYSTEMS LIMITED, FUJITSU COMPUTER PRODUCTS OF VIETNAM, INC., Fujitsu Network Communications, Inc., Fujitsu Telecommunications Europe Limited, FUJITSU TECHNOLOGY SOLUTIONS (HOLDING) B.V.

The Fujitsu Group also aggregates data on R&D costs and benefits related to environmental solutions from subsidiaries other than those shown above. However, the data is aggregated solely for environmental solution costs and benefits, so the relevant subsidiaries are not included in the scope of disclosure for major consolidated subsidiaries.

Fiscal 2011 Environmental Accounting Results

Breakdown of Results (Investment and costs) [billion yen]

Fiscal 2011 Environmental Accounting Results - Breakdown of Results (Capital investment, costs, economic benefits)

Item		Main areas covered	Capital investment (billion yen)	Costs (billion yen)	Economic benefits (billion yen)
Business area costs/benefits	Pollution prevention costs/benefits	Air/water pollution prevention, etc.	0.79(-0.30)	4.74(-0.08)	7.11(-0.07)
	Global environmental conservation costs/benefits	Global warming prevention, saving energy, etc.	1.76(+0.06)	3.13(+0.29)	1.72(+0.34)
	Resource circulation costs/benefits	Waste disposal, efficient utilization of resources, etc.	0.09(+0.07)	2.82(-0.05)	11.05(+0.41)
Upstream/downstream costs/benefits		Collection, recycling, reuse, and proper disposal of products, etc.	0.02(+0.02)	0.92(+0.10)	0.50(+0.06)
Administration costs/benefits		Provision and operation of environmental management systems, environmental education of employees, etc.	0.62(-0.20)	4.27(+0.76)	1.54(+0.61)
R&D costs/benefits		Research and development on products and solutions that contribute to environmental protection, etc.	0.35(-0.50)	20.94(+3.79)	49.14(+10.00)
Social activity costs		Donations to, and support for, environmental groups, etc.	0.00(±0.00)	0.03(-0.03)	-
Environmental remediation costs/benefits		Restoration and other measures related to soil and groundwater contamination, etc.	0.04(-0.04)	0.13(-0.90)	0.20(+0.20)
Total			**3.66(-0.91)**	**36.99(+3.88)**	**71.25(+11.54)**

- 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.

Costs and Economic Benefits in FY 2011

The results of this accounting for FY 2011 showed costs of 36.99 billion yen (an 11.7% increase from the previous year) and the economic benefits were 71.25 billion yen (a 19.3% increase from the previous year). Thus both costs and benefits increased. Also, our capital investment was 3.66 billion yen (a 19.9% decrease from the previous year).

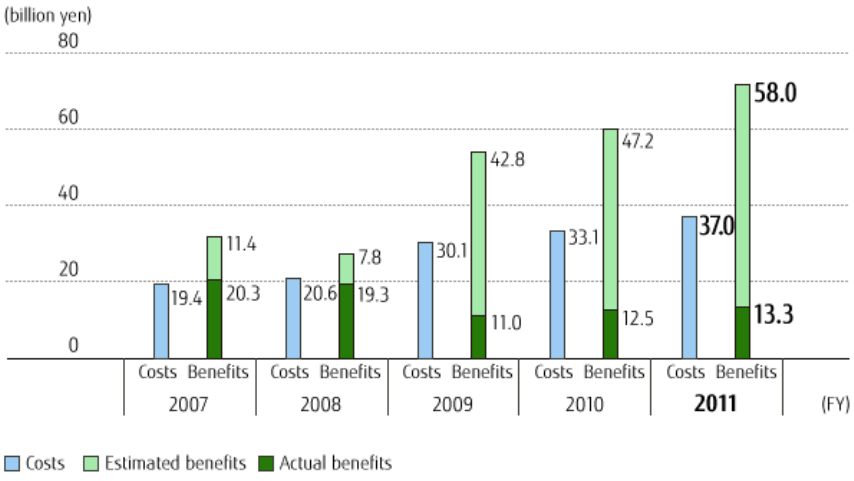
Reasons for Changes in Costs and Economic Benefits

Costs increased by about 3.9 billion yen compared to the previous year. This was due to increases of about 0.8 billion yen in management activities costs, and about 3.8 billion yen in R&D costs, although environmental remediation costs fell by about 0.9 billion yen. Environmental remediation costs decreased because soil and groundwater clean-up work was completed in FY 2010. Management activities costs increased as a result of a review of applicable cost items for environmental advertising. 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 11.5 billion yen compared to the previous year. Global environmental conservation benefits increased by about 0.3 billion yen, resource circulation benefits rose by about 0.4 billion yen, benefits from management activities increased by about 0.6 billion yen and R&D benefits increased by about 10.0 billion yen. The main reason for the increase in global environmental conservation benefits was higher actual economic benefits resulting from continuous investment in energy-efficient facilities at manufacturing sites. Our benefit from resource circulation increased as a result of reduced water supply usage following increased use of recycled water, and an increase in the gain on sale of used components at a subsidiary. The benefits from our management activities rose because of higher environmental advertising costs due to a review of applicable cost items for environmental advertising, resulting in higher estimated benefits from that environmental advertising. 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 2011. 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



The History of Fujitsu's Environmental Activities

The History of Fujitsu's Environmental Activities

1935	Park-style design adopted for new Kawasaki Plant at suggestion of Fujitsu's founder, Manjiro Yoshimura.
1938	Kawasaki Plant completed.
1972	Environmental control sections established at each plant.
1987	Ozone Layer Protection Committee established.
1989	Environmental Committee established.
1990	Environmental management evaluation system implemented.
1991	Environmental Engineering Promotion Center established.
1992	Fujitsu's Commitment to the Environment formulated. Use of CFCs and carbon tetrachloride for cleaning eliminated. Energy Saving Committee established.
1993	Product Recycling Committee established. Waste Control Committee established. Fujitsu Environmental Protection Program (Stage I) formulated. Product Environmental Assessment Guidelines formulated. Domestic Affiliated Companies' Environmental Protection Council established. Environmental Information Service (FJ-CUG) inaugurated.
1994	First issue of Eco-Plaza environmental bulletin published. Use of 1,1,1-trichloroethane eliminated. 1st Fujitsu Group Environmental Technology Exhibition held. Fujitsu Environmental Emblem designed. Overseas Environmental Information Network began operations.
1995	Environmental Management System Committee established. Recycling system established and implemented. Fujitsu Group Worldwide Environmental Protection Council established.
1996	Fujitsu Environmental Protection Program (Stage II) formulated. Environmental Engineering Center homepage placed on intranet. Chemical Emissions Reduction Committee established. First Environmental Report published.
1997	Environmental homepage established on Fujitsu website. All domestic manufacturing sites certified ISO14001 compliant.
1998	Reforestation activities started in Thailand. Green Product program launched.
1999	Environmental accounting introduced. Reforestation activities started in Vietnam.
2000	Four development and service sites in Japan certified ISO14001 compliant. Corporate Environmental Affairs Unit established. Desktop PC awarded Eco-mark for first time.

2001	Fujitsu Environmental Protection Program (Stage III) formulated. Calendar using paper from sustainable forest published. Reforestation activities started in Malaysia.
2002	A world's first: Tin-zinc-aluminum lead-free solder developed. A world's first: Biodegradable plastic parts with lower environmental load employed in notebook computers. Fujitsu Group Environmental Policy established. A world's first: Magnesium alloy recycled in-house applied in notebook computers.
2003	Support for reforestation activities employing Rhythm Forest reforestation network game initiated. Zero waste emission achieved by all 13 plants in Japan.
2004	ISO14001 integrated certification acquired by all Fujitsu Limited sites, among largest systems in japan. 100% Green Product ratio achieved for all newly developed products. Fujitsu Group Environmental Protection Program (Stage IV) formulated.
2005	ISO14001 certification acquired by all Group companies in Japan. Supply of Super Green Products began.
2006	ISO14001 globally integrated certification acquired, including overseas Group companies. Established global environmental management framework for the Group as a whole.
2007	Fujitsu Group Environmental Protection Program (Stage V) formulated. Green Policy Innovation project, which reduces our customers' environmental load through green ICT, started.
2008	Green Policy 2020 medium-term environmental vision formulated.
2009	2009 Biodiversity Action Principles formulated.
2010	Fujitsu Group Environmental Protection Program (Stage VI) formulated.
2011	Environmental Management Dashboard operations began full-scale.

Air pollution is responsible for 2 million deaths worldwide each year. This figure has raised concerns that air pollution will become the leading environmental factor in triggering early death in the future.

As a NEDO*1 collaborative research project promoted at the request of the Government of Thailand, Fujitsu has launched initiatives that will culminate in the development of an environmental monitoring system, as well as support for research into predictive modeling of volatile organic compound (VOC) diffusion and training for necessary engineers. The site of these efforts will be the Map Ta Phut industrial estate, home to Thailand's largest petrochemical complex.

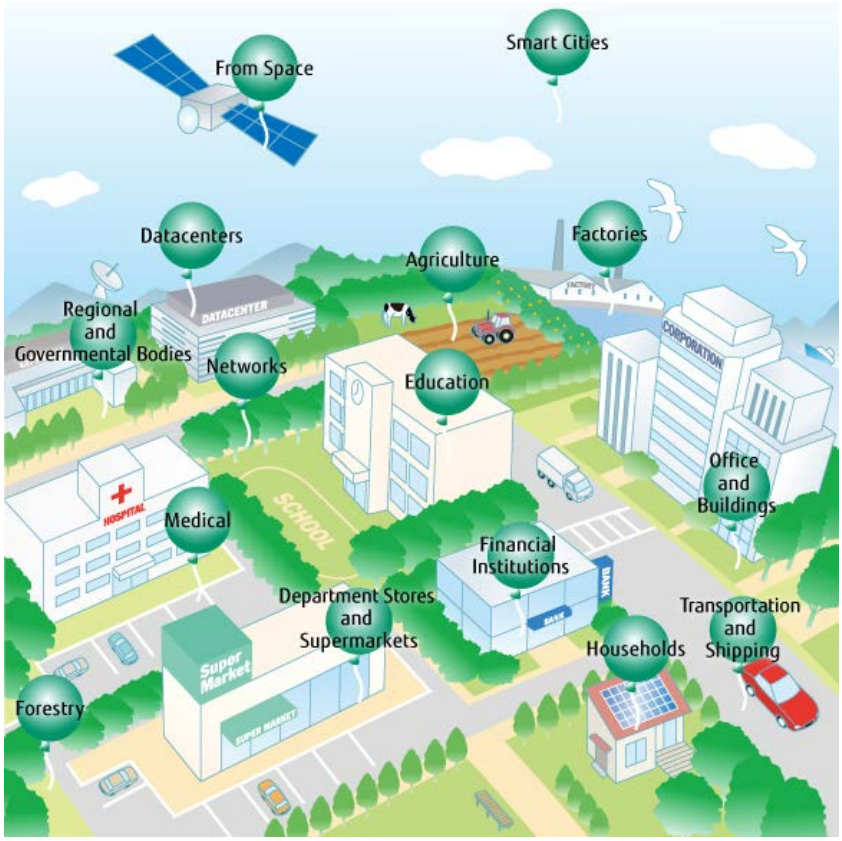
Developed expressly to collect, monitor and analyze data on environmental pollutants, this system aims to prevent air pollution, as well as new or additional adverse health effects from it, even if the trend of industrial urbanization gains further momentum. Fujitsu is also supporting the creation of a basic research platform for predictive modeling of VOC diffusion by Thailand's Chulalongkorn University. Furthermore, to ensure continuous environmental management, Fujitsu will vigorously support technical training and the transfer of knowledge to people in Thailand.

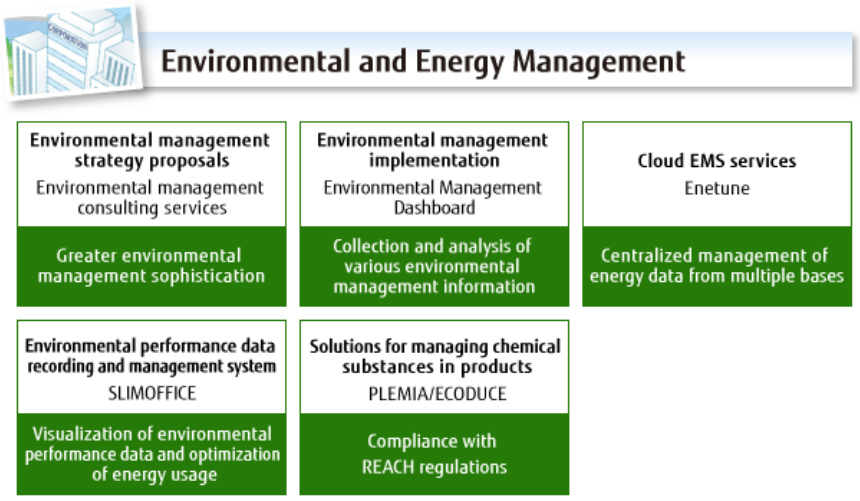
Fujitsu will keep working with the Government of Thailand, leveraging this project as a model case for a comprehensive environmental monitoring system that will assist Thailand in becoming a greener society.

*1 NEDO:
New Energy and Industrial Technology Development Organization of Japan

Fujitsu Group's Green ICT Helping Achieve a Low-Carbon, Prosperous Future

Through its advanced environmental solutions, services, and products, the Fujitsu Group's green ICT is helping to reduce the environmental burden generated by all aspects of our daily lives and by society. We are continuously widening the scope of our efforts in this field so we can help more countries and regions and more people.





Households

Energy-efficient PCs
ESPRIMO desktop and LIFEBOOK notebook PCs
Energy efficiency and conservation

Plugs that measure power, temperature, humidity and illumination
F-PLUG
Better visualization of power consumption for home electronics

PC recycling
Recycling of Fujitsu-made PCs
Contribution to resource recycling

Household energy management
Smart sensing platform (SSPF) V01
Control home electronics and energy devices over a network

Transportation and Shipping

Transport support solutions
Onboard station (digital tachograph)
CO_2 approx.-19%*1

Logistics center system
LOMOS/DJ
CO_2 approx.-58%*1

Traffic information data service
SPATIOWL
Provides real-time traffic information

Wide-area highway transportation simulator
Creation of more eco-friendly transportation environments

Office and Buildings

Energy-efficient PCs
ESPRIMO desktop and LIFEBOOK notebook PCs
Energy efficiency and conservation

Software to reduce PC power consumption
Systemwalker Desktop Patrol
CO_2 approx.-17%*1

Measurement of power consumption
Smart electrical outlets
Visualization of power usage by connectivity devices

Workflow solutions for personnel and expenses
GLOVIA smart workflow
CO_2 approx.-46%*1

e-ledger management software
Interstage List Works
CO_2 approx.-56%*1

Building management system
Futuric
CO_2 approx.-47%*1

Regional and Governmental Bodies

Resident information solutions
MICJET MISALIO
CO_2 approx.-18%*1

Automated system for issuing identifying documents
Conbrio-J
CO_2 approx.-66%*1

Education

e-Learning system Internet Navigware	**School campus administration system** Campusmate-J	**Public library package** iLisfiera
CO_2 approx.**-93**%*1	CO_2 approx.**-54**%*1	CO_2 approx.**-17**%*1

Medical

Electronic health record system with integrated clerical functions HOPE/EGMAIN-RX	**Regional medical network** HumanBridge	**Health management solution** HOPE/webH@ins-GX
CO_2 approx.**-41**%*1	CO_2 approx.**-31**%*1	CO_2 approx.**-55**%*1

Factories

Environmental performance at manufacturing sites Green manufacturing services	**Environmental management system (management of pollutant emissions)** e-FEINS	**Facility management system** Futuric
Further strengthen environmental performance and competitiveness at manufacturing sites	Reduction in environmental risk	CO_2 approx.**-47**%*1
Production scheduling system GLOVIA/SCP FA	**Production planning system for assembly work** GLOVIA/SCP FP	
CO_2 approx.**-60**%*1	CO_2 approx.**-35**%*1	

Department Stores and Supermarkets

POS system for mass retail TeamStore/M	**WebSERVE smart e-COMMERCE** Web-EDI purchasing transactions
CO_2 approx.**-31**%*1	CO_2 approx.**-35**%*1

Financial Institutions

Solutions for the financial sector ATM centeral journal system	**Currency image OCR system for financial institutions** KMASTER
CO_2 approx.**-65**%*1	CO_2 approx.**-59**%*1

Networks

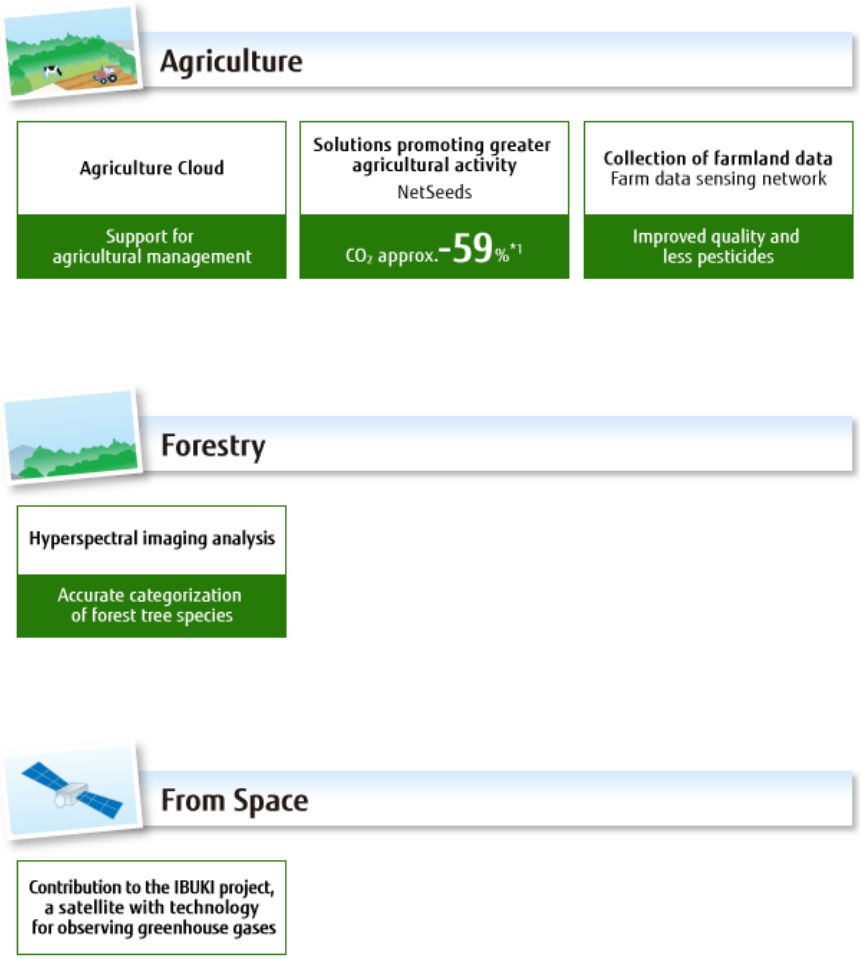
L2 switch FLASHWAVE 2440 Power consumption approx. **-64%**[*2]	**Gigabit ethernet PON system** GE-PON ONU Power consumption approx. **-41%**[*2]	**Network server** IPCOM EX2300 Power consumption approx. **-20%**[*2]
Standard switching hub SH1516C Power consumption approx. **-71%**[*2]	**Real-time image transmission system** IP-900 Power consumption approx. **-24%**[*2]	

Datacenters

Mission-critical x86 servers PRIMEQUEST 1400 S2 Lite Power consumption approx. **-79%**[*2]	**PC server (IA server)** PRIMERGY RX300 S7 Energy consumption rate approx. **-73%**[*2]	**PC server (IA server)** PRIMERGY RX200 S6 energy-saving model Power consumption approx. **-33%**[*2]
Blade server PRIMERGY BX900/BX400 Achieve operations with low power consumption	**Disk Arrays** ETERNUS DX8700 S2 Power consumption approx. **-52%**[*2]	**System operation automation and job schedules** Systemwalker Operation Manager CO_2 approx. **-29%**[*1]
More energy efficient storage operations ETERNUS SF Storage Cruiser ETERNUS SF Advanced Copy Manager CO_2 approx. **-28%**[*1]	**Private cloud-compatible software** Systemwalker Service Catalog Manager Systemwalker Software Configuration Manager Systemwalker Runbook Automation ServerView Resource Orchestrator Reduction in server units of approx. **-50%**[*3]	
Multi-point temperature management Optical fiber temperature measurement system Detailed visualization of temperature distribution in real time	**Support for green facility development** Green Infrastructure Solutions More energy-efficient datacenter facilities	**Operational automation** Systemwalker Runbook Automation CO_2 approx. **-28%**[*1]

Smart Cities

Smart networks WisReed smart network technology; smart network management solutions Collection and management of smart meter data	**Cloud-based energy management system** Enetune Centralized management of power data and forecasting of power demand for multiple bases
Energy management in living environments Smart sensing platform (SSPF) V01 Control home electronics and energy devices over a network	**Atmospheric measurement and countermeasures services** Quickly and precisely measure and devise countermeasures for corrosive substances in the air



*1:
Calculated using an environmental impact evaluation methodology developed by Fujitsu Laboratories Limited

*2:
Comparison relative to power consumption during use for earlier products.

*3:
Internal Fujitsu examples.

Case Study

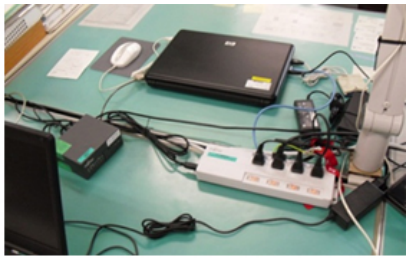
Conducting PC Power Consumption Measurement Trials for the City of Yokohama

In June 2011, as part of the effort to comply with the government directive for energy conservation in the face of looming summer power shortages, the City of Yokohama, together with Fujitsu Limited and the Fujitsu Research Institute, used smart power sockets to conduct trials that measured the effectiveness of power-saving settings on the PCs used at the city office.

The trials showed that using the power-saving setting on all the office PCs in Yokohama could reduce overall power consumption by an estimated 220,000 kWh annually.

The use of smart power sockets not only allows electric power consumption to be measured, it also visualizes in a quantifiable way the power savings gained by changing settings and improving the ways in which office equipment is used. Effective strategies for reducing power consumption during peak load hours can also be formulated. Fujitsu and the Fujitsu Research Institute will continue to use these smart power sockets to render the power consumption of office equipment visible, and help customers achieve their energy savings goals.

Smart power socket
(used for measuring power consumption)



Connecting a gateway,
a smart power socket and a notebook PC

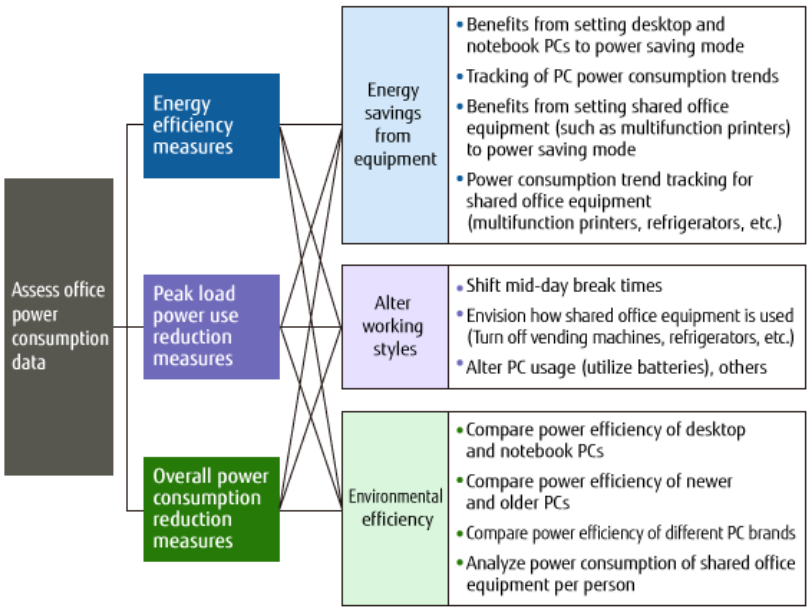
PC Power Consumption per Hour throughout the Yokohama of City and Reductions by Power-saving Settings

(Estimated Values)

Equipment	Units*	Before power-saving settings		After power-saving settings		Reduction (entire city)	Reduction rate
		Power consumption (per unit)	Power consumption (entire city)	Power consumption (per unit)	Power consumption (entire city)		
Total	24,415 units	-	873,939.2Wh	-	755,360.2Wh	-118,579.0Wh	-13.6%
Desktop PCs	7,847 units	66.4Wh	521,040.8Wh	53.4Wh	419,029.8Wh	-102,011.0Wh	-19.3%
Notebook PCs	16,568 units	21.3Wh	352,898.4Wh	20.3Wh	336,330.4Wh	- 16,568.0Wh	- 4.7%

*Number of office-use PCs (excl. Transportation Bureau and Waterworks Bureau) for the City of Yokohama City as of July 20, 2011

Examples of Points of Analysis and Proposed Measures Using Smart Power Sockets



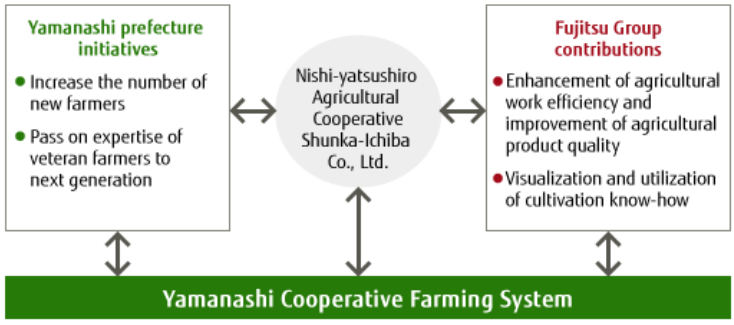
Case Study

Fujitsu's ICT Helping Revitalize Agriculture in Yamanashi Prefecture

Fujitsu utilizes ICT to provide support for primary industries with the aim of encouraging sustainable use of agricultural products and other living resources. As one example of this initiative, on March 14, 2012, we began a field trial for the cultivation of sweet corn using the farm-information sensing network developed by Fujitsu for the "Yamanashi Cooperative Farming System," to help revitalize local agriculture.

Sensor boxes incorporating temperature and humidity sensors with a simple camera were set up at a sweet corn cultivation field owned by the Nishi-yatsushiro Agricultural Cooperative and Shunka-Ichiba Co., Ltd. These boxes collect data on the temperature and humidity both inside and outside the vinyl tunnels covering the corn, and capture images of the coverings opening and closing. The data collected are analyzed to determine the ideal temperature and humidity for cultivation inside the tunnels. It also quantifies the know-how of veteran farmers, and is expected to be useful in training new farmers and assisting companies entering the business.

Sensors at a sweet corn field



- About "Green Policy Innovation": Contribute to reducing the environmental Burden of customers and society

Leading-Edge Green ICT Research and Development

We are concerned with reducing environmental burdens from the initial policy formulation stages in our leading-edge research and development, and are continuously creating technologies that contribute to saving energy and the use of next-generation sources of energy.

Basic Approach

Promote the Development of Products and Services that Contribute to Lower Environmental Burdens

To achieve the goal of reducing CO2 emissions by about 30 million tons a year in Japan by 2020, as proposed in our medium-term environmental vision Green Policy 2020, we need to develop revolutionary leading-edge technologies that are even more effective at reducing environmental impact.

Fujitsu Laboratories Ltd., which handles the Fujitsu Group's leading-edge green ICT R&D, has introduced the slogan "Further 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 help 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 to facilities, systems and solutions.

Initiatives in FY 2011

Quantitatively Evaluating CO2 Emissions Reduction Benefits from the R&D Stage

To accelerate our environmentally oriented R&D, for all of our leading-edge technologies being developed, starting from the initial R&D phases, Fujitsu Laboratories promotes initiatives to quantitatively evaluate the benefits in reduced CO2 emissions (i.e., the environmental contribution) to be expected from the use of its products and services. These efforts are implemented across all units in our laboratories, and since researchers can evaluate the technologies they are responsible for, 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 of leading-edge technologies that is balanced across all three of these axes becomes possible.

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 entire value chain
- Low-carbon technologies for ubiquitous equipment
- Energy-saving technologies for datacenters and networks
- Environmental solution technologies

Exhibiting synergies between total technology development and open innovation

- Consolidation of elemental technologies from materials and devices to solutions
- Global technology coordination

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 datacenters and networks, and the area of solutions.

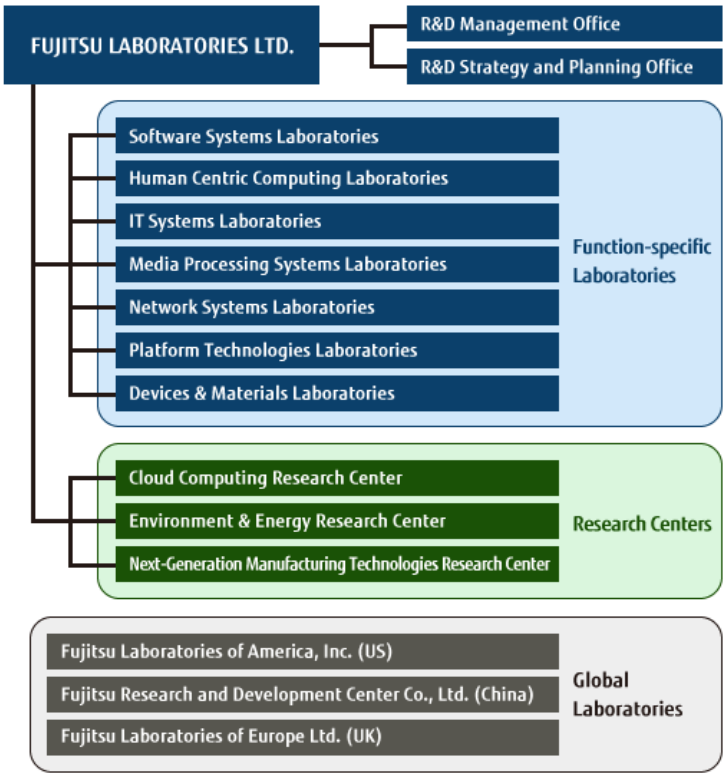
The target for the next-generation datacenter and network area is developing technologies that can double the overall efficiency of ICT equipment by the end of FY 2012 (April 2012 - March 2013). The target for the solutions area, also by the end of FY 2012, is to increase by at least 70% the development ratio for technologies that improve the effective reduction of environmental burdens.

In FY 2011 (April 2011 - March 2012), we cleared the target of developing technologies that can increase ICT equipment efficiency by 1.5 times. In the solutions area, meanwhile, we were able to achieve a development ratio of 61% for technologies that improve the effective reduction of environmental burdens, and thus met our target of 60% for the fiscal year.

While further increasing the environmental contribution of our leading-edge technologies, Fujitsu Laboratories will aim to expand the

application areas to areas such as complete systems, including those in which the individual technologies, operations and management work together.

Organization of Fujitsu Laboratories Ltd. (As of March 2012)



Case Study

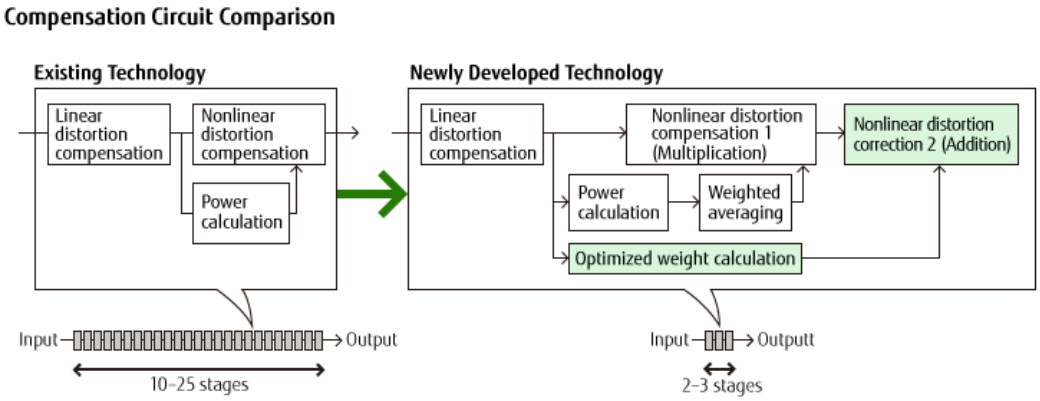
High-Performance Distortion-Compensation Circuit, Enabling Compact and Energy-Efficient Ultra-High-Capacity Fiber-Optic Transmission Systems

In September 2011, Fujitsu developed a digital signal processing algorithm to compensate for waveform distortions in signals transmitted by fiber-optic cables in long-haul transmission systems of 100 km or more.

When transferred over long distances of hundreds of kilometers by fiber-optic lines, ultrafast signals carrying data at speeds of 100 Gbps or more suffer from waveform distortion caused by nonlinear optical effects, making it difficult for the signal to be correctly received. This has prompted research into nonlinear compensation technology, which can restore the signal received with distortion to a clean waveform. Using conventional methods, however, the implementation of nonlinear compensation technology would require massive circuits, and reducing the scale required of such circuits, therefore, has been a pressing issue. In September 2010, Fujitsu developed a proprietary technology that would dramatically simplify these circuits. However, ongoing improvements in terms of circuits that are more compact and consume less electricity are still needed.

This latest Fujitsu technology will make it possible to deliver circuits that are more compact and have lower power consumption than ever before. Networks using this technology would enable the utilization of massive data volumes at ultra-high speeds, resulting in networks capable of supporting the next generations of smartphones and cloud services.

Striving toward commercialization of this technology around 2015, Fujitsu is studying a wide range of potential applications, among them the technology's use in high-capacity short-range transmissions, such as those used in datacenters and access networks.



- Fujitsu Develops High-Performance Distortion-Compensation Circuit, Enabling Compact and Energy-Efficient Ultra-High-Capacity Fiber-Optic Transmission Systems [Press Release]

Case Study

Cooling Technology That Utilizes a CPU's Waste Heat

In November 2011, Fujitsu developed cooling technology that employs waste heat generated by CPUs to produce chilled water that can be used to cool server rooms.

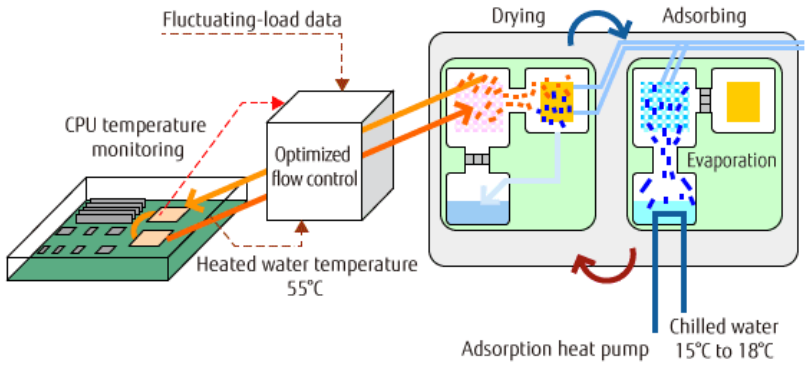
Most factories currently produce chilled water using electricity as a way to cool equipment. However, efforts are also being undertaken to produce chilled water from high-temperature waste heat.

Effectively utilizing heat from CPUs to continuously chill water as a coolant requires hot water that is consistently at 65°C or above. Accordingly, the cooler (below 65°C) waste heat from CPUs was long thought to be unsuitable for the production of chilled water. The variable loads on CPUs also result in inconsistent temperatures, another factor that has made exploiting waste heat from ICT equipment difficult. Consequently, this waste heat has typically been vented outside by air conditioning, without being used productively for cooling.

Against this backdrop, Fujitsu's new cooling technology has made it possible to continuously produce chilled water using the relatively cool 55°C waste heat that CPUs emit. Using water chilled by the waste heat from CPUs in air-conditioning systems can reduce total air-conditioning power requirements for a datacenter by roughly 20%. This means that power consumption by a single server rack can be cut by as much as 12,000 kWh per year, or a volume of CO2 equivalent to that absorbed by 360 cedar trees.

Going forward, we are working to increase the reliability of these technologies, and expanding their scale and space efficiency, with the goal of deploying them in datacenters around 2014. Moreover, Fujitsu aims to utilize low-temperature waste heat in areas beyond datacenters, like factories, office buildings, and solar power generators.

Overview of Cooling Technology Using CPU Waste Heat



- Fujitsu Develops Cooling Technology That Utilizes a CPU's Waste Heat [Press Release]

Case Study

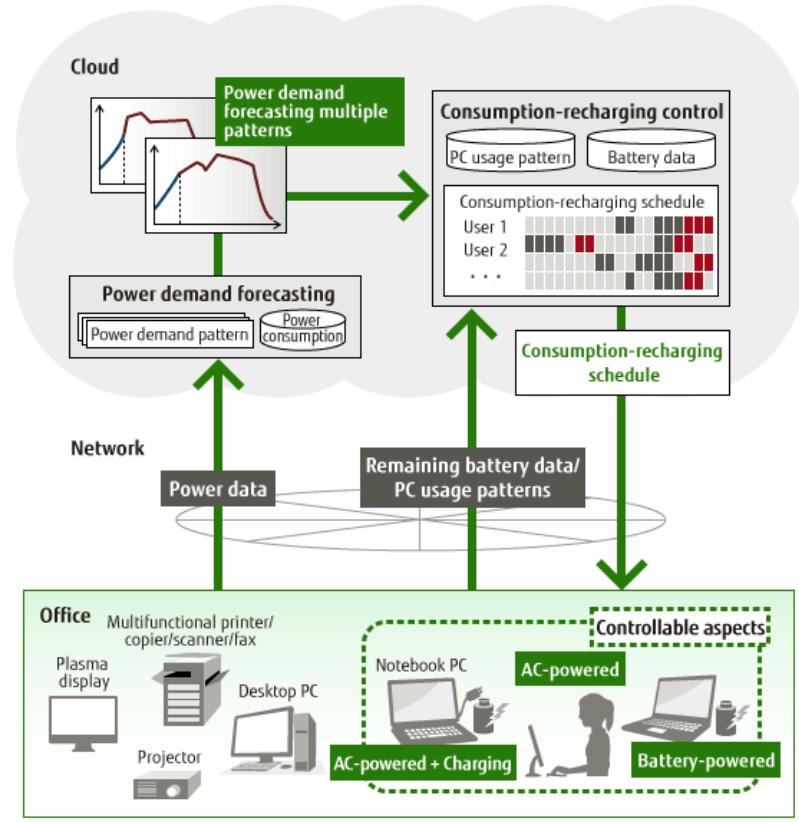
Industry's First Peak Power Demand Reduction Technology for Deployment in Smart Cities

In December 2011, Fujitsu developed the industry's first peak power demand reduction technology intended for deployment in smart cities.

There is growing expectation in Japan that new power sources will be utilized to address power supply shortages resulting from the impact of the Great East Japan Earthquake. This is likely to lead to the installation of multiple storage batteries in a variety of locations. It is anticipated that there will be greater need for a mechanism to enable peak power demand reduction and demand balancing. When the technology is actually deployed in smart cities, the ability to control the charge and consumption of electricity from multiple storage batteries across the community, as well as to cut peak power demand in stages across the entire smart city, will be essential. However, for small communities, power consumption will vary significantly depending on the number of users and electrical devices utilized, making it difficult to accurately forecast such fluctuations. Electricity consumption-recharging schedules, therefore, will need to take into consideration increases in peak power demand and the lifespan of storage batteries.

With Fujitsu's new technology, a wide range of data-including the power consumed by each office and residence, as well as other usage patterns and the charge levels of storage batteries-is collected in the cloud. By enabling cloud-based integrated control of storage batteries, peak power demand can be effectively reduced. Going forward, Fujitsu aims to deploy this technology in smart cities to help realize societies that are better able to supply their own energy needs and ensure energy supply stability.

Peak Power Reduction Technology Applied to an Office Setting



- Fujitsu Develops Industry's First Peak Power Demand Reduction Technology for Deployment in Smart Cities [Press Release]

Case Study

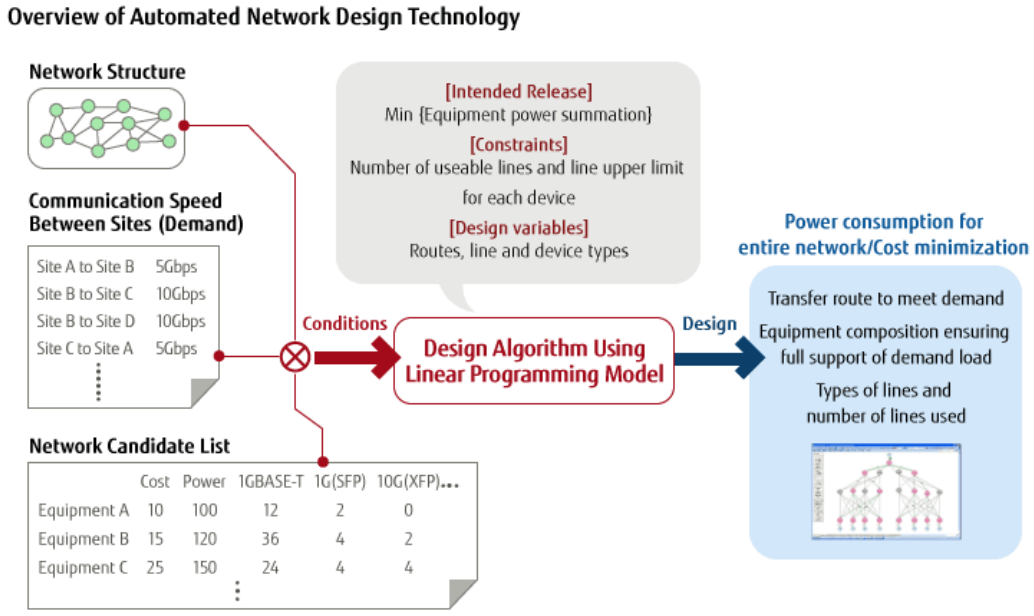
Automated Network Design Technology for Power Reductions of 20%

In August 2011, Fujitsu successfully developed an automated design technology that fulfills requirements for communication speed and network architecture required for Ethernet networks, while enabling overall network power consumption to be reduced by roughly 20% compared to previous levels.

Conventionally, network design has involved putting top priority on accommodating data traffic at peak times; thus system engineers would augment high-speed lines and design the layout of high-performance network devices to accomplish this. Depending on the network devices and line connections, engineers faced the problem of limiting power consumption when it was high, and had to consider a multitude of design conditions, such as communication speeds between sites. As a consequence, the overall picture was often difficult to grasp and excess power consumption tended to occur.

This new automated design technology not only makes it possible to reduce network power consumption but also to design low-cost networks with the customer's preferred network architecture, communication speeds and devices.

Looking ahead, we intend to further develop this technology so it can be applied to non-Ethernet networks, and conduct further research with a view to its commercial viability.



- Automated Network Design Technology for Power Reductions of 20% [Press Release (in Japanese)]

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 as highlighted below.

Eco-Friendly Product Development

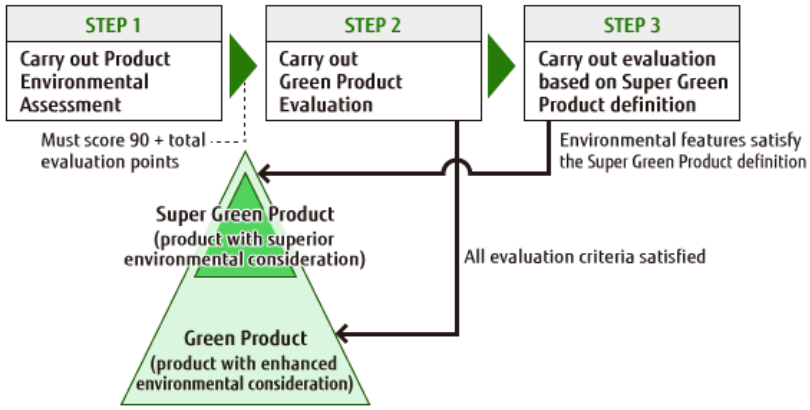
The Fujitsu Group has adopted a unified Group-wide approach to eco-design for newly designed products and works to improve environmental performance throughout the product life cycle. We have been implementing our own environmental assessments for products since 1993, and strive to develop eco-friendly products that reflect environmental considerations in such areas as energy saving, 3R design*1, 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 ecofriendly 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)."

To promote Green Product development across Fujitsu globally, we established an internal standard, the Eco Design Standard*2, that conforms to the IEC 62075*3 international standard and strives to meet the environmental requirements of the market. Fujitsu PCs and servers are designed in both Japan and Europe and are provided globally. In FY 2011, another 22 products were recognized as being Super Green Products.

Mechanism for Green and Super Green Product Evaluation



*1 3R design:
Design based on the principles of reduce, reuse and recycle

*2 Eco Design Standard:
Covered equipment is PCs, servers, and storage systems.

*3 IEC 62075:
Audio/video, information and communication technology equipment-Environmentally conscious design. This standard was published in 2008 and established as JIS C 9914 in 2010 in Japan.

Case Study

PRIMERGY RX300 S7, the PC server that improves energy consumption efficiency by as much as 73%

Companies doing business globally need to ensure the datacenters they operate in each country are environmentally friendly. Improving energy efficiency not only enables operators to process a greater volume of data within their existing power capacity without placing a burden on their cooling systems, but also leads to reduced environmental impact. Given these needs, Fujitsu's PRIMERGY RX300 S7 is the world's first single-node server to exceed 5,000 overall ssj_ops per Watt under the SPECpower ssj®2008*4 benchmark for server energy efficiency.

PRIMERGY RX300 S7

ServerView Suite is a server management solution that supports simplified and automated PRIMERGY energy management, and enables PCIe ports to be automatically turned off when not in use. Coupled with state-of-the-art technology, like power supply units boasting a 94% conversion efficiency rate, we improve energy efficiency by up to 73% over our previous products, helping Fujitsu to set a new record under SPECpower_ssj ®2008. Readily recyclable materials were also employed, and make up more than 99% of the total material utilized for the server itself.

*4 SPECpower_ssj ®2008:
A benchmark developed and sold by Standard Performance Evaluation Corporation (SPECR) for measuring the energy efficiency of mass-market computers.

VOICE

Senior Vice President, Fujitsu Technology Solutions Product Development Group
Jens-Peter Seick

For datacenters, making the most efficient use of available resources is a challenge that requires substantial investment and time. The Fujitsu Group offers a multitude of innovations that are up to the task. We will provide products tailored to our customers' efficiency and performance needs, regardless of datacenter scale.

Case Study

The ESPRIMO Q910, Reducing Carbon Footprint Across the Lifecycle

By employing a high-efficiency power unit, the ESPRIMO Q910 delivers reduced heat output and power consumption in response to customer needs for greater energy conservation. The compact design takes up less desktop space, and the eye-catching design was named a winner of the "red dot design award" in 2012.

ESPRIMO Q910

Because most compact PCs use an external AC adapter, the typical AC adapter has a standard conversion efficiency of 87%. The ESPRIMO Q910, on the other hand, offers a power supply unit that achieves 90% conversion efficiency installed on a chassis just 1.9 liters in volume, while still enabling HDD and memory expansion.

In addition, many of the models in the ESPRIMO series use halogen-free printed circuit boards, in a further effort to reduce environmental impact. The elimination of halogen and PVC*5 from chassis parts has already been adopted by the various eco-labels, but with the ESPRIMO line, Fujitsu has succeeded in removing PVC from cable insulation and the plastic parts used in fans, and also offers customers PVC-free power cords.

*5 PVC:
Polyvinyl chloride

VOICE

Fujitsu Technology Solutions Work Place Systems, Research & Development, Hardware
Peter Kastl

While it was a challenge for us to meet all of the needs involving safety, production, and serviceability, we were faced with particular difficulties in ensuring scalability.

Case Study

New ATM FACT-V X200's Default Eco Mode Cuts Power Use by About 40%

FACT-V X200 uses about 40% less power than our earlier models*6 when running in its default eco mode. When not in use for a specified time, FACT-V X200 shifts into super eco mode, automatically shutting down the unit to reduce standby power consumption by around 75%*6.

This Super Green Product was designed with the environment in mind, using recycled plastic and plant-based resin for some of its parts and aiming for a higher product recycling rate. It also offers much better operability, with a next-generation bill recycling unit offering top-class domestic currency storage capacity, compatibility with diverse operation procedures, and highly reliable design.

*6:
Compared with Fujitsu's earlier models FACT-V and FACT-V model10

FACT-V X200

VOICE

**Project Manager, Technology Department I, Financial Systems Business Group, Fujitsu Frontech Limited
Satoshi Mukaikawa**

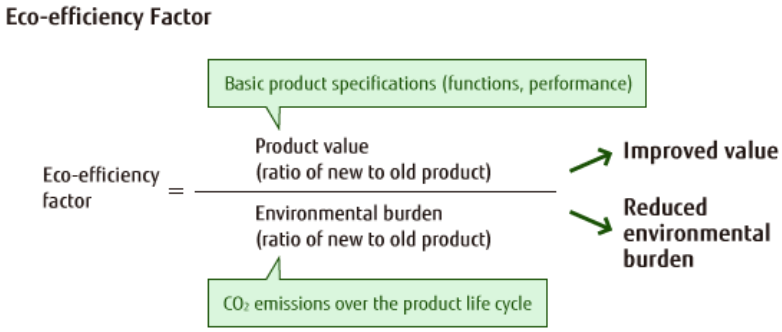
ATM components cover very extensive ground, from control units to mechanical units, firmware, middleware, and applications. We succeeded in drastically reducing power consumption by clarifying numerical targets right from the start of development, putting the engineers charged with various aspects of development on the same page, and taking committed steps to reduce power consumption at the component level.

- Eco-Friendly Products : Case Study Archives

Using the Eco-Efficiency Factor to Reduce Product Environmental Burden

We introduced the eco-efficiency factor*7, which simultaneously evaluates both environmental burden reductions and product value increases 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 2011, we also revised our targets upwards based on actual results as of the end of FY 2010. In FY 2011, we exceeded our newly established target of 3.5, with an actual result of 4.1. Product lines primarily responsible for contributing to these results included our photonics solutions, mission critical IA servers, and our base stations. These improvements were achieved in part through improvements in transmission speeds and data processing capabilities, and through reductions in product weight and energy consumption.

*7 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.

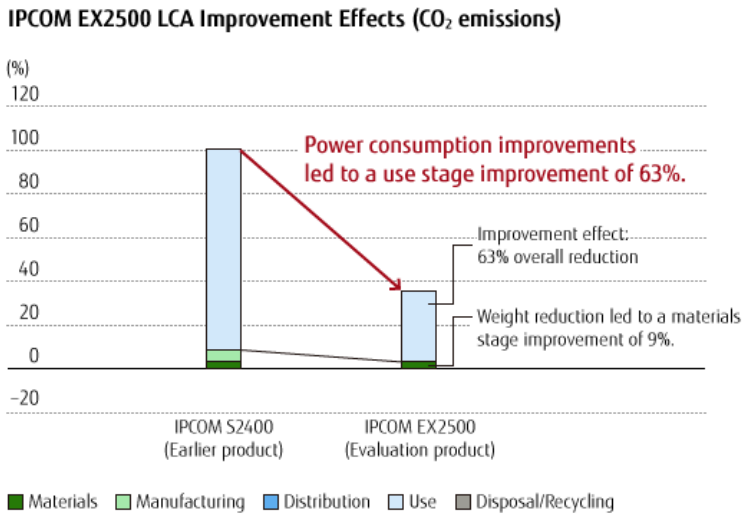


Carrying Out Life Cycle Assessment (LCA)

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*8.

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 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.

*8 Own database:
Our own unique database of unit values, created by Fujitsu Laboratories based on input-output tables.



Promoting 3R Design

Through its proprietary product environmental assessments and Green Product evaluations, the Fujitsu Group is working to apply a wide variety of 3R-friendly technologies that conserve resources and improve recyclability. Technologies being incorporated into our products that are effective in conserving resources include ways to reduce the number of parts and cables, to save space through improved performance and more tightly integrated design, and digitization of manuals and other documentation.

We are also working to improve recycling rates by utilizing readily reusable parts from the product design stage; and by putting a recycling structure in place, we promote the recovery and recycling of used ICT equipment. For example, usable parts are separated and extracted from products returned from leasing, and after checks to verify they are of the same quality as new parts, are either reused as parts in new products or as spare parts for maintenance.

Eco-Friendly Packaging

Fujitsu is working on a variety of methods for reducing use of packaging and cushioning materials. Traditionally, notebook computers were shipped packaged in individual cardboard boxes, but by placing multiple units in a single returnable container, we have reduced shipping space and succeeded in eliminating cardboard waste. For larger products, we have replaced existing foam cushioning materials with returnable air packs, significantly reducing CO2 emissions. We also use soy-based inks, which are lower in volatile organic compounds (VOCs), a known atmospheric pollutant, to print the boxes used in packaging PCs and other equipment.

Reducing Specific 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 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 regulations in Japan but also applies to global regulations on chemical substances included in products.

- **Fujitsu Group Specified Banned Substances [145KB]**
- **Fujitsu Group Specified Reportable Substances [150KB]**
- **Fujitsu Group Specified Controlled Substances [65KB]**

Management of Chemical Substances Restricted or Banned by Law

"Fujitsu Group Specified Banned Substances" comprise two separate categories: universally banned substances and substances that are banned at the national and/or regional level.

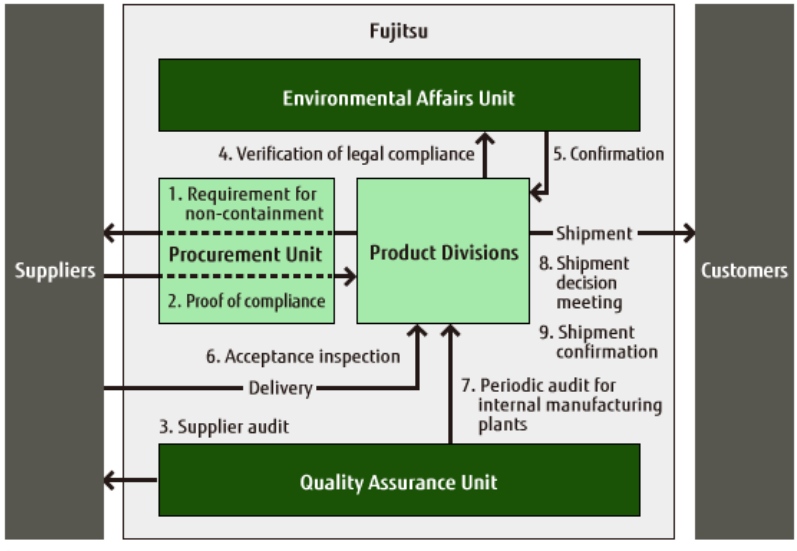
We have also established a Fujitsu Group Green Procurement Direction and strengthen control of the chemicals in our products by taking the initiative in directing our suppliers to construct chemical management systems (CMSs).

- Green Procurement

In response to regulations such as the RoHS Directive*1, 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.

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

Framework for RoHS Directive Compliance



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

Controlling Substances of Concern

The Fujitsu Group Specified Reportable Substances list includes substances that are REACH regulation*2 candidate substances*3, 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. For example, the Fujitsu ESPRIMO Q910 desktop PC, which made its market debut in June, 2012 mainly in Europe, adopted halogen-free printed circuit boards (PCBs) and a (partially) PVC-free approach.

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

*3 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 participate in activities such as the Joint Article Management Promotion consortium (JAMP) to contribute to the design, construction and widespread adoption of mechanisms that can transmit information effectively.

Among these industry groups, 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.

The Fujitsu Group is not only actively monitoring substances specified under REACH regulations; since June 2011 we have also been introducing AIS across the Group in order to better understand and manage the presence and utilization of substances suspected to contain hazardous elements. Moving forward, we hope to effectively utilize the data we have collected to make significant contributions toward minimizing the impact of chemical substances on people and the environment.

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.

- The PLEMIA/ECODUCE website (in Japanese)

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.

Recycling Activities that Conform to the Concept of Producer Responsibility

In accordance with the concept of Extended Producer Responsibility (EPR*1), 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.

*1 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.

Targets and Achievements in Stage VI of the Environmental Protection Program

Targeting a sustained 90% resource reuse rate*2 of business ICT equipment globally at Fujitsu recycling centers, in FY 2011 we achieved a rate of 94.1% (90.9% within Japan and 98.5% overseas).

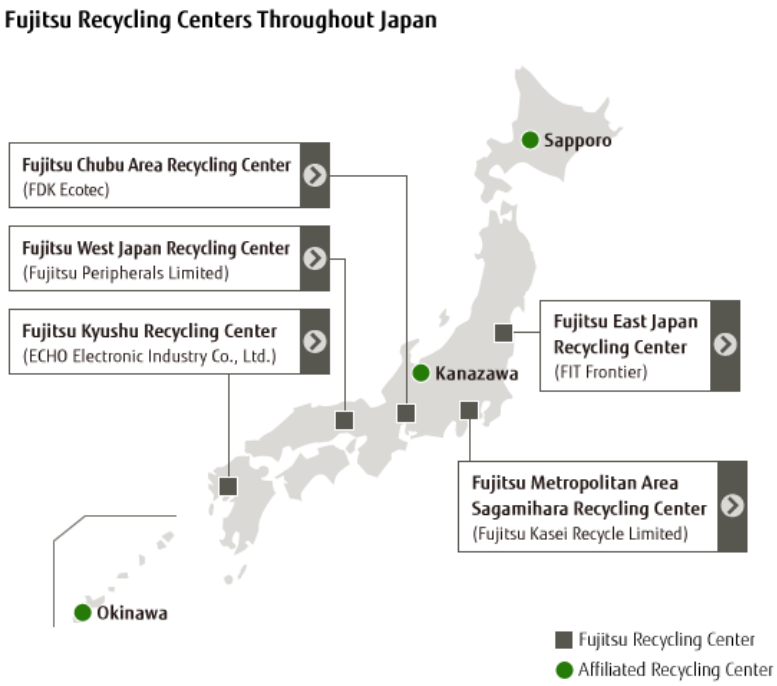
*2 Resource reuse rate:
The ratio of the amount (by weight) of recycled parts and resources to the amount of end-of-life business ICT products processed.

Promoting product recycling efforts 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).

Wide Area Industrial Waste Disposal Certificate



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 5,487 tons of recycled ICT products from corporate customers (used ICT products for business applications) in FY 2011, and achieved a resource reuse rate of 90.9%. Also, we have now collected a total of 83,358 end-of-life PCs from individual customers.

Trends in Resource Reuse Rate of End-of-Life Business ICT Products

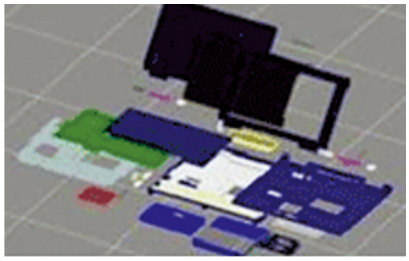
FY	2008	2009	2010	2011
Resource reuse rate	91.5%	90.8%	90.6%	90.9%

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

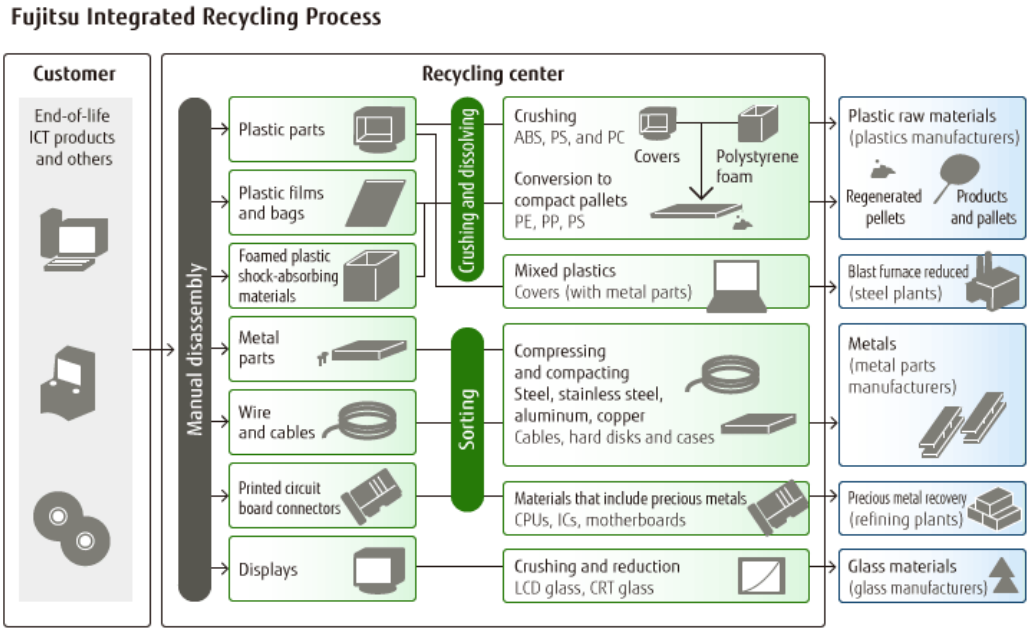
Promoting Recycling

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.

Plastic material identification equipment

Ballpoint pens and folders made from recycled plastic

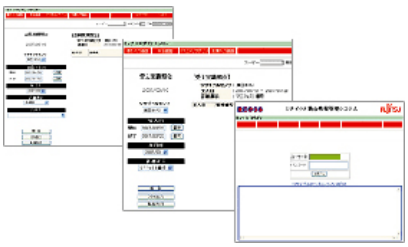
Also, to keep our customers informed of these initiatives, we distribute ballpoint pens and folders made from recycled plastic at exhibitions and other events, as well as demonstrating PCs being manually disassembled.



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.



Integrated Recycling Information Management System

Operation of Security Systems

A high level of security is maintained at Fujitsu Recycling Centers by using infrared cameras to monitor automatically for intruders and check the storage status of the accepted products.

Security system

Security camera monitoring system

Providing services to customers

We provide recycling services for our customers.

- ICT product disposal and recycling(in Japanese)

Promoting Product Recycling Overseas

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).

Visitor experiencing PC disassembly in the FTS environmental booth.

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 2011we processed 3,468 tons of waste ICT products and achieved a resource reuse rate of 98.5%.

To disseminate these activities widely, at CeBIT 2010, the world's largest ICT related trade show held in Germany in FY 2010, we both presented our recycling efforts and demonstrated PC disassembling at our booth and were honored by a visit from Germany's environment minister.

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)

Environmental Labeling and Information Disclosure

We will actively disclose environmental information about our products to customers.

Disclosure of Environmental Information on Products

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 PCs under the EPEAT system, which encourages the purchase of green PCs and is used chiefly by US government bodies. In Japan, product environmental information for computers, magnetic disk devices, displays, printers, scanners, and mobile phones covered by national green purchasing laws is published on the Ministry of the Environment's website, 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.

- EPEAT website: Information from the electronic products environmental assessment tool by the US Institute of Electrical and Electronics Engineers (IEEE)
- Ministry of the Environment's website: Information on products covered by Japan's green purchasing laws
- Energy Conservation Center, Japan website: Information on products conforming with the international ENERGY STAR Program
- List of PC Green Label System-compliant products: Information about Fujitsu Products in compliance with the PC Green Label System formulated by Japan's PC3R Promotion Association
- List of registered EcoLeaf label products: A list of Fujitsu products that have obtained the "EcoLeaf" label developed by the Japan Environmental Management Association for Industry The EcoLeaf environmental label is granted to products that quantitatively demonstrate outstanding environmental performance in carbon emissions and throughout the entire product lifecycle, from resource extraction, manufacture, distribution and usage, to disposal and recycling.
- List of products with Eco Mark certification: A list of Fujitsu products that are certified with the Eco Mark distinction developed by the Japan Environment Association

Environmental Labeling

The Fujitsu Group displays environmental labels in accordance with the ISO 14020 series of international standards governing environmental labeling. The three types of environmental labels are highlighted below.

Type I : Label usage is approved following independent certification of the environmental qualities of a product submitted for review by a company or group.

Eco Mark (Certified by the Japan Environment Association) In January 2001, Fujitsu desktop PCs became the first in Japan to receive certification. Certification has been obtained for printers. • Japan Environment Association Eco Mark	

Type II : A company or organization independently publicizes the environmental qualities of its products.

Green Policy Innovation Logo This environmental label is unique to the Fujitsu Group, and is displayed on Green and Super Green products, where special consideration has been given to environmental performance. • Green Policy Innovation Logo	
Energy Efficiency Labeling System This label is displayed on products meeting standards prescribed by Japan's Act on the Rational Use of Energy. • Energy Efficiency Labeling System	

PC Green Label System For PCs, Fujitsu displays this mark on products meeting standards stipulated by the PC3R Promotion Association. • PC3R Promotion Association	
Energy Star program The international Energy Star Program label is displayed on computers (PCs, workstations), displays, printers, and scanners registered with the program. • International Energy Star Program	

Type III : Products that quantitatively demonstrate the environmental burden posed over the entire lifecycle.

EcoLeaf Environmental Label (Japan Environmental Management Association for Industry) In May 2003, Fujitsu notebook PCs were the first in Japan to be certified under this label. • Japan Environmental Management Association EcoLeaf Environmental Label	

Solutions that Benefit the Environment

By stepping up the certification of Environmentally Conscious Solutions, we are working globally to provide solutions that reduce the environmental burdens of our customers and society.

Basic Approach

To reduce the amount of greenhouse gas emissions on a global scale, efforts will be needed not only to reduce power consumption and to develop environmental technologies, but to profoundly alter the way people live and work. ICT is indispensable to achieving these innovations, and it will be critically important to take full advantage of such ICT in the future.

The Fujitsu Group sees ICT as the way to reduce environmental burdens (which we call "Green by ICT"). From this viewpoint, we are globally promoting the provision of leading-edge Green ICT to achieve the CO2 reduction targets in our Green ICT project, called Green Policy Innovation and will contribute to reducing the environmental burden of society as a whole.

Action Policy in FY 2011

Promoting Electricity Conservation and Energy Savings in Addition to CO2 Emissions Reductions

We believe that we must actively promote the reduction of environmental burdens by using ICT to achieve the CO2 reduction targets in our Green Policy Innovation initiative. In FY 2011, customer needs related to electricity conservation and energy savings mounted in the aftermath of the Great East Japan Earthquake. In response, Fujitsu launched a campaign to help customers reduce environmental impact by offering proposals for the use of ICT to conserve electricity and energy, in addition to reducing CO2 emissions.

Efforts in FY 2011

Increasing the Certification of Environmentally Conscious Solutions

Employing ICT solutions increases power consumption due to more servers and computers being used, but such solutions can also reduce the impact on the environment by eliminating paper use and reducing the movement of people and goods for more efficient use of office and warehouse space.

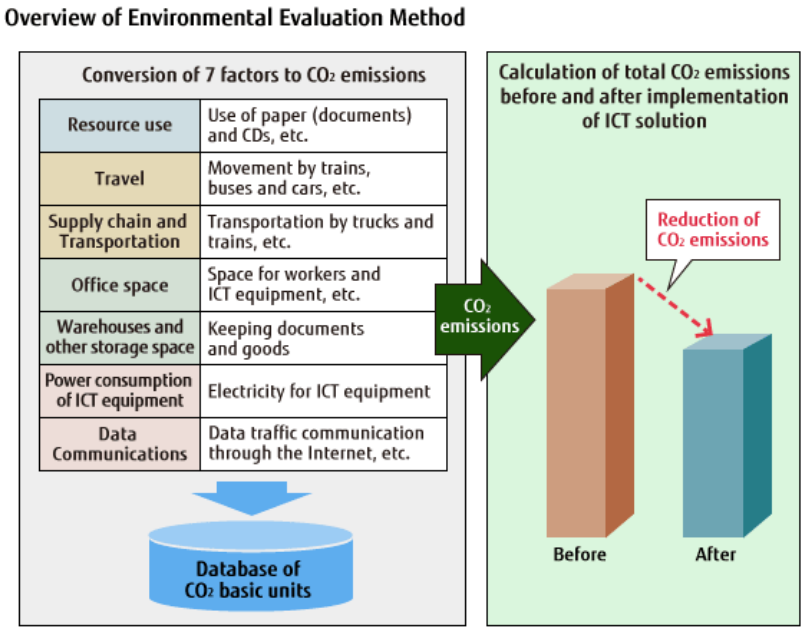
At the Fujitsu Group, we have assessed the quantitative reduction in environmental burdens (in terms of reduced CO2 emissions) from ICT adoption using an environmental impact assessment method developed by Fujitsu Laboratories Ltd., and we certify products and services that exceed the required standard as Environmentally Conscious Solutions.

In FY 2011, we enhanced support for the Environmentally Conscious Solution application process, which resulted in 28 new solutions being certified, bringing the total to 258. In FY 2012, we intend to continue expanding the scope of certified products and services and will consider program revisions, such as establishing standards from perspectives other than just CO2 emissions reduction.

Environmental Impact Assessment Method

We analyze environmental impact reductions produced by ICT solutions by classifying the implementation effects into seven categories: resource use, travel, supply chain and transportation, office space, warehouse space and other storage space, power consumption of ICT equipment and data communications. The benefits are converted into CO2 emissions using CO2 basic units (CO2 conversion coefficient) developed by Fujitsu. CO2 emissions from before and after ICT solution implementation are calculated and compared, and reduction effects are evaluated accordingly.

This approach accords with assessment guidelines published by Japan's Ministry of Economy, Trade and Industry and Ministry of Internal Affairs and Communications, and with methods (L.1410) recommended in March 2012 by the International Telecommunication Union (ITU).



- International Standardization of Methodology for Environmental Impact Assessment of ICT Goods, Networks and Services [Press Release]

Global Efforts

In order to globally promote solutions that contribute to reducing environmental burdens, in FY 2010 we launched the Environmentally Conscious Solutions certification system overseas as well. We have since completed informing overseas representatives about the assessment method and construction of the certification system itself. A remote medical system in Laos and other technologies have already been assessed under the system. Going forward, we intend to increase the number of solutions assessed and certified, and will strive for 100% coverage by the end of FY 2012 for targets under the Fujitsu Group Environmental Protection Program (Stage VI), in terms of both divisions and regions, in addition to domestic sites.

Promoting Visualization of Environmental Burden Reduction Effects from Customer ICT Utilization

In order to promote environmental impact reductions from ICT utilization, it is important that customers using ICT solutions understand how and how much they contribute to the environment. From this perspective, the Fujitsu Group makes it possible to see how ICT solutions reduce environmental impact and actively proposes this type of visibility to customers. In FY 2011, we worked to increase use of EcoCALC, a web tool for calculating environmental contributions, with a view to increasing solutions that make reduction benefits visible.

To help encourage use of the tool, we held over 40 operational presentations for sales reps and system engineers at nationwide sales branches beginning from October 2010. Over 1,500 people participated. Incorporating feedback from training participants, EcoCALC was fully updated in January 2012. The tool's specifications have been changed so that it can calculate not only CO2 emissions reductions but also energy savings and cost reductions, areas of considerable customer need.

EcoCALC updated in January 2012

Among activities to promote use, points are granted based on the number of proposals offered for making the benefits of environmental burden reduction more visible. Organizations acquiring the most points are recognized at company-wide events. As part of the Green IT Awards 2011 granted by Japan's Green IT Promotion Council in October 2011, Fujitsu received the Review Board Special Award for the development of its EcoCALC eco-contribution calculation web tool and company-wide activities aimed at achieving a more energy-efficient society.

Green IT Awards 2011 Logo

Awards ceremony

In January 2012, the scope of EcoCALC usage was expanded from the Fujitsu Group to business partners, making it possible for even more customers to visually confirm environmental burden reductions.

Going forward, we will promote horizontal dissemination of environmental solution examples and work to institute visibility for environmental burden reduction benefits in all Fujitsu solutions. We will also work to develop EcoCALC globally and make it possible for even more customers to visually track the effectiveness of their efforts to reduce environmental impact.

Case Study

Adoption of Virtualization Technology for More Efficient Operations and Reductions in Energy Consumption and CO2

Fujitsu and the National Hospital Organization Kure Medical Center have collaborated to completely upgrade the latter's medical information system to a highly secure, user-friendly thin client system using virtualization technology.

Medical record screen and web browser simultaneously displayed

With Kure Medical Center's previous medical information system, the hospital's electronic medical records (EMR) system and information system used to access the Internet (for a web browser, e-mail, and databases used in diagnosis and treatment) were each separately managed using independent networks for security reasons. The two systems could only be accessed using separate terminal, which caused operational efficiency to become an issue despite the vital importance of swift responsiveness in a medical setting. Moreover, in managing information for any of the medical departments, including the surgery department, data entered into the EMR system would need to be re-entered into the surgery department's administrative system, making administration duplicative and cumbersome. Consequently, in addition to workflow efficiency, preventing human error also emerged as an issue.

To meet these challenges, the partners set out to create a system design built on the installation of two virtualization servers-one for the EMR system, another for the information system-that enables screens from both servers to be simultaneously viewed from a single terminal. Now, through the use of a thin client system and a smart card-based single sign-on, Fujitsu and Kure Medical Center have built a secure, user-friendly medical information system. The new system enables users to securely access the Internet while simultaneously using the EMR system. The new system also has a built-in roaming function, allowing hospital personnel to call up their own files from any terminal in the hospital, thereby improving workflow efficiency.

Moreover, adoption of this system is also helping to mitigate environmental impact. Server consolidation through virtualization technology enables CO2 emissions to be reduced by 60% and, with the use of thin clients, CO2 emissions from terminals to be cut by 70%. The system has the potential to cut emissions by roughly 80%, resulting in a total projected reduction benefit of around 150 tons of CO2.

This example is just one way in which Fujitsu is leveraging ICT to support its customers' operations and help reduce their environmental burden.

Case Study

Internal Initiative Example: Saving Energy and Reducing CO2 by Replacing Hardware Products

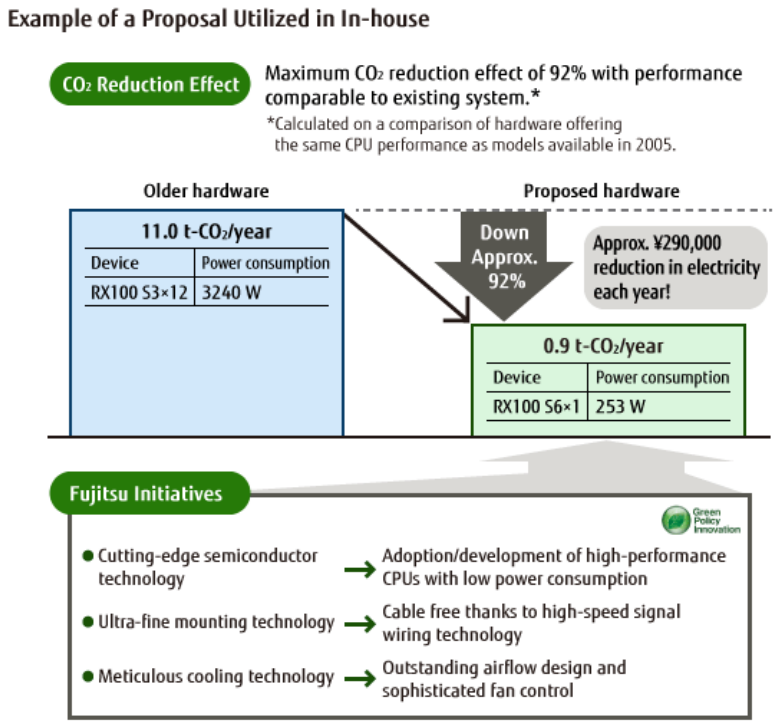
Fujitsu's Social Infrastructure Business Unit II made proposals for saving energy and reducing CO2 by replacing hardware products in order to help customers reduce their environmental impact.

We first investigated the extent of reductions in power consumption and CO2 emissions that would occur by replacing the old Fujitsu devices with new Fujitsu models. The results were compiled into a customer proposal format, which made the solution easy to propose for the division's employees. We also calculated reductions in power consumption and CO2 emissions that would occur if the customer's entire system, including competitor devices, were replaced with the latest Fujitsu products, and conveyed the benefits of such upgrades. Moreover, we tabulated on a department by department basis the number of proposals clearly stating power and CO2 reductions or reduction rates resulting from ICT implementation. These figures served to stimulate awareness in the division with regard to increasing such proposals and helped revitalize the proposal process.

As a result of this initiative, the number of proposals promoting power and CO2 reduction benefits increased by roughly 120 times compared to FY 2010. We also successfully encouraged customers to reduce environmental impact through hardware upgrades.

This series of activities received the Special Environmental Award in FY 2011 at the Environmental Contribution Awards, an internal awards program. Division employees commented that the appeal of their proposals was enhanced by showing customers specific figures for energy savings, and that they learned how to engage in environmental activities while performing sales activities.

We intend to continue this initiative and further help customers reduce their environmental impact.



- Solutions that Benefit the Environment : Case Study Archives

Providing Environmental Solutions

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

Basic Stance

In the context of increasingly severe environmental problems, our customers must promote environmental management that aims at achieving business growth and reductions in environmental burdens. Both are essential if they are to conduct sustainable business.

We at Fujitsu provide environmental solutions to support our customers' environmental management. We evaluate their environmental activities and "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 to 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.

In FY 2012, we began providing customers with the Environmental Management Dashboard, which realized peak power cuts of up to 41% for the Fujitsu Group in Japan in the summer of 2011. In addition to achieving peak power reduction targets, the Environmental Management Dashboard can also be regarded as a new management indicator for energy costs, and continues to assist customers in meeting their cost reduction targets.

- Environmental Management Dashboard
- Providing Environmental Solutions : Case Study Archives

The Fujitsu Group is actively working to promote the use of renewable energies to help prevent global warming and ensure stable energy supplies.

Use of Geothermal Heat Gaining Attention as a New Renewable Energy Source

Renewable energy has been garnering increasing attention not only for reducing CO2 emissions but also for lessening energy supply-related risks. The Fujitsu Group, too, is promoting the use of renewable energy as a key objective of its Environmental Protection Program (Stage VI). As part of its commitment, the Group has deployed and is evaluating the performance of its first geothermal heat extraction system at the Nagano Plant in Japan.

In contrast to high-temperature geothermal heat used to generate electricity, the geothermal heat utilized by the new system is low-temperature heat found at relatively shallow depths in the Earth's crust, which stays at a fairly constant temperature year round due to the insulating properties of soil.

For this reason, it has long been used to preserve food, ice and other perishable items. In Japan, where annual precipitation is high, rainwater permeates the soil to become groundwater, which is stored in ample amounts. The thermal conductivity of groundwater is high, so it is easy to extract geothermal heat from it, meaning Japan enjoys favorable conditions for this form of energy. Heat extraction systems are relatively simple, so their cost performance is superior to other types of renewable energy. Geothermal systems therefore have great potential for more widespread use in the future.

At the Nagano Plant, attention turned to the potential use of this geothermal heat in water heater equipment for air conditioners in clean rooms that run around the clock.

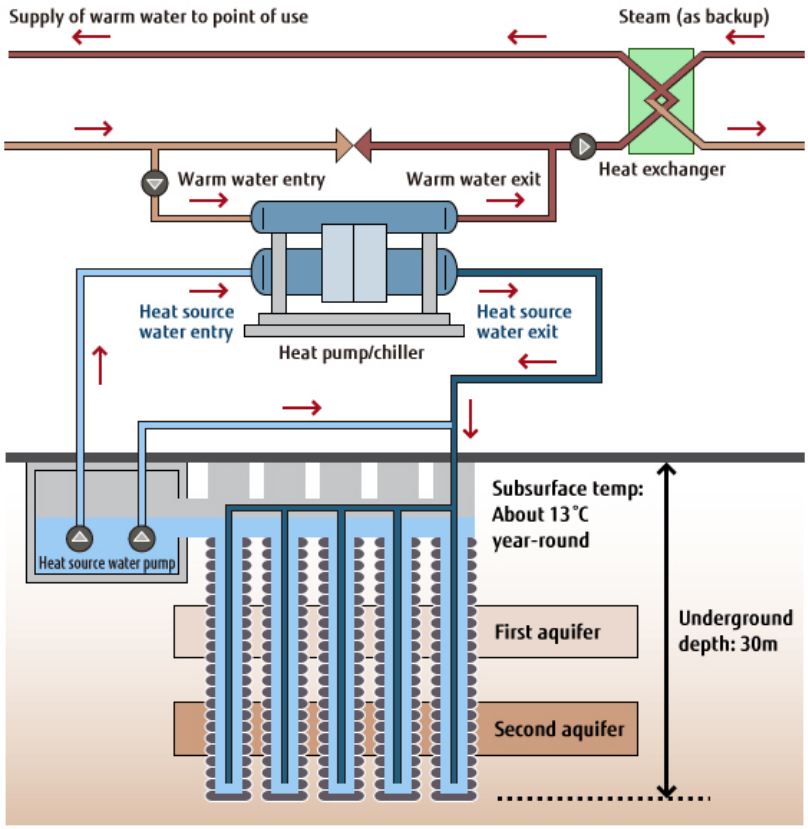
Repeated Testing for Effective Operations

The strata under the Nagano Plant has aquifers in two places, between 3 and 10 meters and between 18 and 23 meters belowground, making it relatively easy to extract geothermal heat. The system utilized has 31 heat extraction pipes, which leverage corrugated coaxial double piping techniques and are embedded in the ground. The geothermal heat that is extracted by running water through these pipes is used to produce hot water via a heat pump. There is no concern about groundwater depletion with this system because it only extracts heat-not water-from the ground.

In October 2011, we began excavation work to bury the heat extraction pipes and began operating the system at the end of January 2012. When the system first went into operation, heat could not be extracted in planned amounts, but after running tests from various angles, the cause was found to be the flow velocity of the circulating water used for heat extraction. A circulation pump was installed, and this resulted in a dramatic improvement in the amount of heat extracted. The system is currently projected to generate roughly 155W of energy per 1 meter-long pipe using this system, which should cover 90% of the air conditioning load of the plant's clean rooms.

Fujitsu Facilities Ltd., which installed and tested the system, intends to acquire and accumulate expertise in geothermal systems and establish technologies for utilizing geothermal heat.

Schematic of the Geothermal Heat Extraction System



Toward Widespread Use of Geothermal Heat

Compared to generating hot water via its existing gas boiler system, test calculations suggest that deploying the geothermal heat extraction system will enable Fujitsu to reduce annual fuel consumption by roughly 47kL and annual CO2 emissions by roughly 120 tons. Geothermal heat is expected to provide exceptional benefits for heating and cooling at public facilities, hospitals and other buildings and as a source of heat for agricultural greenhouses, which require round-the-clock temperature management.

Moving forward, we will put the system into wider use at the Nagano Plant and explore its horizontal deployment to other Fujitsu Group locations, while actively promoting its adoption in a variety of other settings.

Members of geothermal heat extraction system installation project

VOICE

Project Leader, Facility and Environment Services Division, Fujitsu Facilities Ltd.
Yasushi Yazawa

Geothermal heat offers superior stability and cost performance because it changes little from season to season or day to day. Another advantage is that dead space is not created since geothermal heat extraction pipes are embedded in the ground.

We initially struggled to extract more heat after installing the system, in part because it was our first attempt at using geothermal heat. We will develop the operational know-how to effectively harness geothermal heat, utilizing it when we embark on the horizontal in-house deployment of the system.

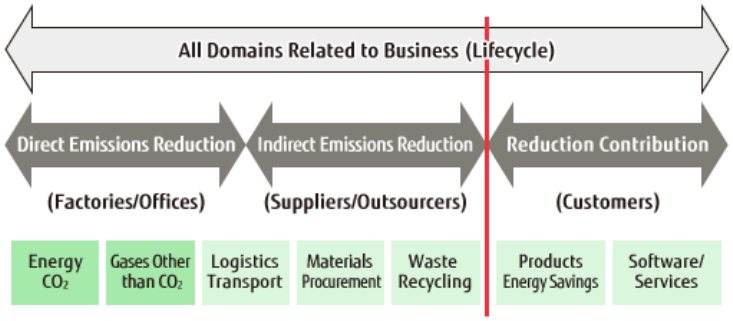
Efforts to Prevent Global Warming

We are examining all of our business operations in an effort 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 actions include reducing emissions of CO2 due to energy consumption and other greenhouse gases at our factories and offices, and reducing emissions associated with transportation.

Furthermore, we are working to prevent global warming throughout all areas of business activity by helping to cut greenhouse gas emissions from our customers and society in general by developing Green Products and Super Green Products that contribute to reducing environmental burdens and by providing ICT solutions.



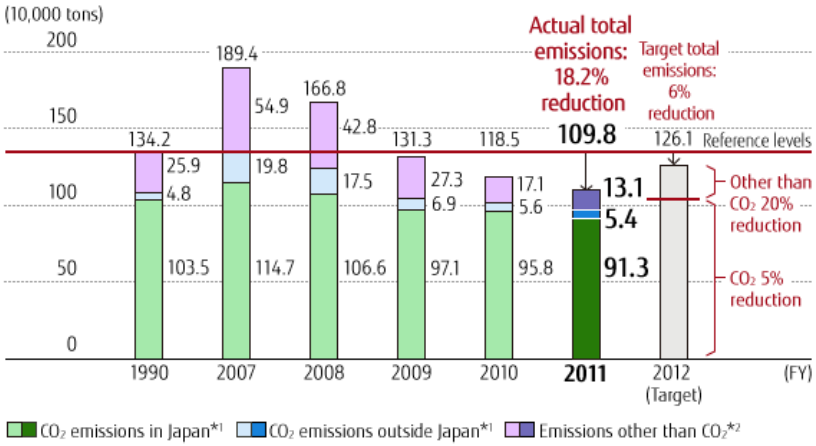
Preventing Global Warming from the Business Site

Greenhouse Gas Emission Reduction Targets and Results

We have set "reducing our total greenhouse gas emissions by 6% by the end of FY 2012 compared with FY 1990 (the breakdown for total emissions is a 5% reduction in CO2 due to energy consumption and a 20% reduction in gases other than CO2)" as a goal of the Fujitsu Group Environmental Protection Program (Stage VI).

Our actual total emissions for FY 2011 globally were about 1.098 million tons (per unit of actual sales: 2.458 tons/billion yen), which is a 7.3% or 87 thousand tons reduction from the previous fiscal year, and an 18.2% reduction from FY 1990.

Trends in Total Greenhouse Gas Emissions



*1 CO_2 emissions in/outside Japan: CO_2 conversion coefficient for purchased electric power has been calculated with a fixed value of 0.407 ton of CO_2 per MWh since FY 2002 for performance reports in our Environmental Protection Program.

*2 Emissions other than CO_2: These are converted to equivalent amounts of CO_2 using the global warming potential (GWP) of each gas. Our FY 1995 performance is taken to be the emissions in FY 1990.

Reduction of CO2 Emissions due to Energy Consumption

CO2 emissions due to energy consumption are responsible for about 88% of the Fujitsu Group's greenhouse gas emissions. Therefore, we continuously work to improve the following energy-saving measures to reduce CO2 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 via measurement of energy consumption visualization and proactive use of that data
- Use of renewable energy such as solar power

Further, we set up Low Carbon Committee 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 CO2 emissions for FY 2011 were about 967 thousand tons (913 thousand tons in Japan, 54 thousand tons outside Japan), which corresponds to a 46 thousand ton reduction from the previous fiscal year and a 10.7% reduction from FY 1990.

Case Study

Reducing Air Conditioning Load with Total Heat Exchangers for Clean Room Air

Fujitsu Facilities Ltd. renovated its Building No. 7 in conjunction with relocation of the Nagano Plant of Fujitsu Advanced Technologies Ltd. The renovation included installing total heat exchangers for processing clean room outside air. The project was started immediately after the Great East Japan Earthquake of March 2011, and the system was built with power shortages taken into account from the implementation design stage. The system reduces the air conditioning load. In addition, the total heat exchangers are equipped with humidification functionality for stability from a humidity control standpoint as well.

As a result of this initiative, power use was reduced by 17,000 kWh during the summer (from June to September) and steam was reduced by 55 tons in the winter (December to March) and in the interim periods (April, May, October, and November). This translates to an annual reduction in CO2 emissions of 16 tons.

- Reducing Greenhouse Gas Emissions Associated with Manufacturing : Case Study Archives

Reducing Emissions of Greenhouse Gases Other than CO2

Other than CO2, the Fujitsu Group mainly uses perfluorocarbon (PFC), hydrofluorocarbon (HFC) and sulfur hexafluoride (SF6) in its semiconductor divisions. Following the semiconductor industry's action plan*1, we have set a target of a 20% reduction by the end of FY 2012 for the Fujitsu Group Environmental Protection Program (Stage VI). To this end, we have changed to gases with a lower global warming potential (GWP) and continue to install equipment to remove harmful materials in new and existing fabrication lines.

In FY 2011, we reduced the amount of these emissions measured in GWP equivalent by 41 thousand tons, to about 131 thousand tons. This corresponds to a 49.6% reduction compared to FY 1995.

*1 Semiconductor industry's action plan :
Semiconductor industry target (voluntary action plan) of "reducing emissions by 10% relative to FY 1995 levels by the end of FY 2010."

Promoting the Use of Renewable Energy

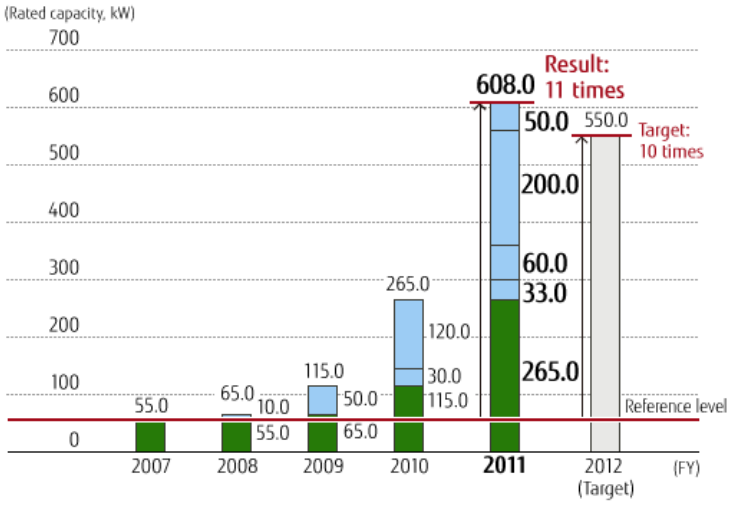
Although we have adopted renewable energy sources such as solar power generation at our business sites, in the Fujitsu Group Environmental Protection Program (Stage VI), we have set increased use of renewable energy as a new goal, and introduced the target of installing ten times as much capacity by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

In FY 2011, we installed 343 kW of solar generating capacity at four business sites in total, including 200 kW at the Sekijyo Plant of Fujitsu Telecom Networks Limited, and 50 kW at Fujitsu I-Network Systems Limited. This resulted in a total installed capacity of solar generating equipment of 608 kW at the end of FY 2011, which is 11 times that of FY 2007.

Solar power generating equipment was initially installed at the Sekijyo Plant to cope with electric power usage restrictions mandated by the Japanese government in the summer of 2011. The plant achieved a reduction in peak hour electricity demand of 33%, exceeding the mandated reduction target of 15%.

Solar panels at the Sekijyo Plant of Fujitsu Telecom Networks Limited

Cumulative Total Installed Solar Power Generation (renewable energy*)



*Renewable energy utilization ratio: Calculated based on the rated capacity of solar power 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*2, 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 across Japan, including for the office space we rent, and manages the amount used by each Group company. 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.

The amount of energy used by the Group within Japan under the Energy Conservation Law in FY 2011 was 588 thousand kl (crude oil equivalent), corresponding to CO2 emissions of about 1.026 million tons*3 based on the Act on Promotion of Global Warming Countermeasures*4, which was also revised.

*2 Energy Conservation Law :
Act on the Rational Use of Energy.

*3 about 1.026 million tons :
There are differences in ranges for tabulation that include tenants and calculations based on CO2 conversion coefficients for each electric power company for results reporting under our Environmental Protection Program.

*4 Act on Promotion of Global Warming Countermeasures :
A system for calculating, reporting, and disclosing the amount of greenhouse gas emissions stipulated by Japan's Act on 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 2011, we were validated by an external institution in line with the pilot project*5. Our emissions level for FY 2010 was verified, and we achieved our targets for the FY 2008 to FY 2010 period.

*5 External institution in line with the pilot project :
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.

Reducing Greenhouse Gas Emissions Throughout the Supply Chain

There have been increasing discussions s in recent years about how to calculate and report greenhouse gas emissions generated from a company and its supply chain. The ICT sector in particular reportedly has a major contribution to make in reducing emissions in other sectors*6. For this reason, the Fujitsu Group is placing emphasis on calculating and reporting greenhouse gas emissions for the entire supply chain, including contributions, and is actively conducting related initiatives worldwide.

Since FY 2003 we have published figures for greenhouse gas emissions from corporate activities through the Carbon Disclosure Project (CDP)*7, and are actively involved in greenhouse gas emission calculations, including supply chain emissions. In addition, we are also taking part in drafting the ICT sector guidelines*8 for the GHG Protocol, an international set of guidelines for calculating and reporting greenhouse gas emissions. In FY 2010 we took part in the product systems subcommittee of the Ministry of the Environment's investigative commission on methods for calculating greenhouse gas emissions in the supply chain. So-called 'Scope 3' calculations were conducted and issues identified. Based on these findings, in FY 2011 the Ministry of Economy, Trade and Industry and the Ministry of the Environment jointly sponsored an investigatory commission on calculating organizational greenhouse gas emissions through the supply chain. The electrical and electronics industry's basic approach was clarified regarding the fact that industry characteristics must be considered, specifically the many formats for Scope 3 calculations and reporting and the complexity and length of supply chains that often include overseas suppliers.

Against this backdrop, in FY 2012 Fujitsu will launch an in-house working group to closely consider the possibilities and issues inherent in Scope 3. We will be considering how to incorporate a Scope 3 perspective into contributions to environmental impact reductions for society as a whole.

*6 :
"2010 WHITE PAPER Information and Communications in Japan" from the Ministry of Internal Affairs and Communications (Japanese only)

*7 Carbon Disclosure Project (CDP) :
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.

*8 ICT sector guidelines :
Greenhouse Gas Protocol ICT Sector Guidance

Case Study

Participation in Great Taipei World Car Free Day

Fujitsu Taiwan, which is involved in the ICT business, participated in the 2011 Great Taipei World Car Free Day held in the Taiwanese capital of Taipei in September 2011. The event is held every year to promote environmentally friendly transit options. Special lanes are established for pedestrians and bicyclists, and Taipei residents are called on to use modes of transport with low CO2 emissions and public transportation.

Fujitsu Taiwan encouraged all its employees to commute to work in environmentally friendly ways to help reduce Taipei's CO2 emissions. As a partner in the campaign to save polar bear habitats, the company ran enlightenment activities on the importance of biodiversity as well as other proactive initiatives as an official sponsor, ultimately receiving the Taipei Mayor's Award for its efforts.


Fujitsu Group's Power-Saving Initiatives

All of our business locations in Japan are involved in electricity conservation using Environmental Management Dashboards.

Achieved over 20% energy savings during summer 2011 at Fujitsu locations serviced by Tokyo Electric Power Company and Tohoku Electric Power

In response to the Great East Japan Earthquake that struck in March 2011, the Japanese government asked large electric power users to reduce their peak electric power use from July 1 to September 9, 2011 by 15% from the level in the previous year. The Fujitsu Group set up a power conservation committee with the Company president as chairman. Following an examination of conservation targets and countermeasures, the Group then introduced power-saving initiatives to achieve an even higher reduction of 20% for business sites and factories within regions served by the Tokyo Electric Power Company, Incorporated (TEPCO) and Tohoku Electric Power Co., Inc. In addition, Fujitsu offices and factories served by The Kansai Electric Power Co., Inc. (KEPCO) reduced power consumption by over 10%, as directed by the government. Bases located in other utility service areas have also decided on initiatives to curb their electricity usage.

Measures to Conserve Electricity Using Environmental Management Dashboards

In implementing measures to conserve electricity in the wake of the Great East Japan Earthquake, the Fujitsu Group's responsibility was to determine how it could save electricity with minimal effects on business. Essentially, the Group was asked to continue to provide its customers with products and services without delay, while working to achieve its goal of using less electric power. Visualizing the state of electric power usage in real time was critical to meeting these challenges. But success also required mounting a response based on a Joint Utilization Control Scheme*1 for cutting peak usage by treating multiple factories as a single unit. This prompted the Fujitsu Group to develop and incorporate the Environmental Management Dashboard in its measures to conserve electricity.

A screen displaying power usage

The Environmental Management Dashboard displays on a user-friendly portal screen the state of electric power use every hour at each business facility, discrepancies from target values, comparisons with power use the previous year, and predictions of demand for each day based on production plans. For factories under the Joint Utilization Control Scheme, when it appears that the electric power consumption target value is about to be exceeded as a result of the air temperature or state of operation of production lines, factories under the scheme must take immediate action to mutually adjust their electric power consumption. Real-time monitoring then takes place via the Environmental Management Dashboard.

By rigorously monitoring electricity savings and formulating and executing related measures in this way, we were able to reduce electricity consumption beyond our target of 20% within the TEPCO and Tohoku Electric service areas. We not only cut peak power use but also generated considerable cost savings from reductions to total power consumption.

*1 Joint Utilization Control Scheme:
Under electric power consumption caps set by Article 27 of the Electricity Business Act, multiple business facilities of a large electric power user jointly control the maximum electric power used. It is an initiative which has been confirmed to cut maximum electric power use by a group of business facilities. For example, when business facility A discovers that its power cap is about to be exceeded, business facility B cuts down energy use by an equivalent amount.

Main Power Saving Initiatives of the Fujitsu Group

From July to September 2011, power conservation measures were implemented at Fujitsu Group locations in Japan, led by large-scale sites, as well as Fujitsu plants and tenant office buildings nationwide.

1. Approximately 4,100 of the roughly 10,000 servers used for Fujitsu's development and business operations were either relocated to datacenters outside the regions serviced by TEPCO and Tohoku Electric, or had usage temporarily suspended.
2. Fujitsu reduced the number of production facilities and shifted operations of some manufacturing processes to nighttime.
3. At its buildings and offices based in commercial buildings that it occupies as a tenant, Fujitsu curtailed the use of elevators and lighting, adjusted the temperature of air conditioners, and suspended the use of water heaters and refrigerators.

The Fujitsu Group had succeeded in reducing year-on-year power consumption by between 20% to 41% at offices and factories (excluding exempted sites) located in areas serviced by TEPCO and Tohoku Electric. In addition, Fujitsu offices and factories served by KEPCO reduced power consumption by over 10%.

Case Study

All Fujitsu's 100 thousand PCs set to power-saving mode

As a measure to save energy in summer of 2011, all PCs used by the Fujitsu Group in Japan were set to power-saving mode. First, Systemwalker Desktop Patrol, a client management software tool, was used to collectively verify the settings of all of the roughly 100 thousand PCs targeted. Steps were then taken for non-compliant PCs to promote a settings change. Applying power-saving mode to all PCs is estimated to cut power consumption by around 11,000 kwh per day across the Fujitsu Group.

About Systemwalker Desktop Patrol

Systemwalker Desktop Patrol is a client management product for conducting centralized management of ICT assets such as PCs, printers and software licenses, as well as automatic security patch application/audits and other operations. In August 2009, amid recent growth in environmental consciousness in Japan and revisions to the country's Act on the Rational Use of Energy, Fujitsu unveiled Systemwalker Desktop Patrol V14g. In addition to conventional client management features, this latest version has new functions for visualizing power usage, carbon emissions and operating status designed to reduce wasteful PC power consumption.

Systemwalker Desktop Patrol V14g makes it possible to automatically retrieve PC power-saving settings, verify if these conform to the power conservation policy set by the system administrator or organization, and prompt the user to change the settings if needed. Settings can also be set automatically to comply with the policy.

- Systemwalker Desktop Patrol V14g

Example of results report on power-saving settings audit

Reducing Electricity Consumption by 10% in KEPCO Service Area in Winter 2011

During the winter of FY 2011 as well, major power consumers in the Fujitsu Group and our business locations carried out electricity conservation activities based on a request received from the government. The goal was to reduce power consumption year on year during the four-month period between December 1, 2011 and March 31, 2012; specifically, a 10% reduction in peak power use in the KEPCO service area, and 5% in other service areas.

As a result, in the KEPCO service area, we reduced peak power consumption by at least 10% over the entire four-month period from December to March, successfully achieving our target. In addition, the Fujitsu Group as a whole achieved its target by reducing peak power consumption by at least 5%.

Future Activities to Save Electricity

Even during periods in which the government does not request reductions, the Fujitsu Group will utilize Environmental Management Dashboards and engage in established electricity conservation efforts at domestic business locations and factories within a scope that does not affect business activities. We will conduct electricity conservation activities in accordance with government requests during the summer of 2012 as well.

Going forward, we intend to help customers reduce and level power consumption, using this initiative as an environmental reference model.

Environmental Activities in Factories

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 Fujitsu 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.

Development of Green Production Technology

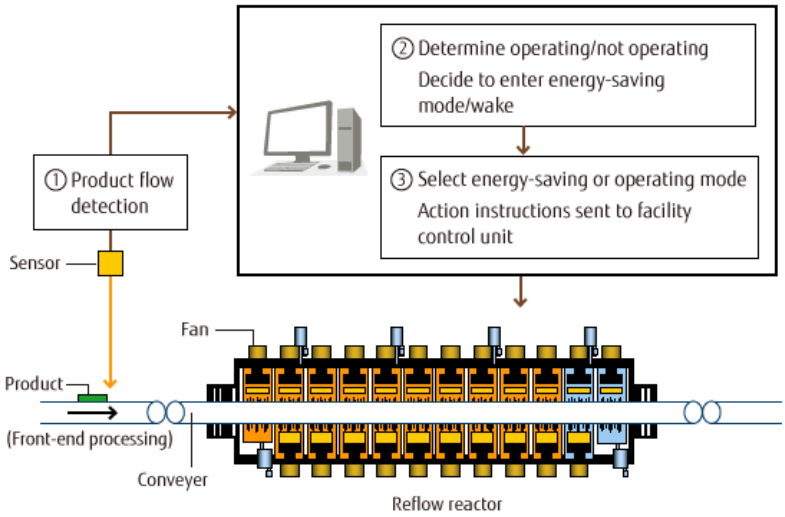
Assembly, processing and other production-related processes and equipment account for roughly 40% of overall CO2 emissions at Fujitsu factories. In a move to cut energy consumption associated with production, we are working to visualize power usage particularly around surface mount technology (SMT), assembly and testing processes. Improvements are then implemented beginning with processes and facilities where the most efficient reductions in power consumption are possible.

Case Study

Reducing Standby Power by Operating Reflow Soldering Furnace on a Just-in-Time Basis

In reflow furnaces, power is always supplied to the heater even if no products are being processed. As a result, the heater used for soldering accounts for the bulk of the power consumed by this equipment. To reduce the use of standby power while this equipment is idle, we moved to develop a "just-in-time" (JIT) scheme for reflow furnaces that supplies the required amount of energy as needed. Information from products input for front-end processing, derived from sensors that detect when products pass by, determines whether the system should be active or idle. Standby power usage is reduced by putting the system into optimal energy-saving mode, which minimizes the hot-air fan speed, slows down the conveyer and turns system power off. This JIT scheme is currently applied to one reflow furnace at the Oyama Plant of Fujitsu Telecom Networks Limited, where it has reduced energy consumption for this equipment by 13%. This translates into an annual savings of roughly 150,000yen in energy costs and a reduction in CO2 emissions of around 4 tons. Plans call for extending this scheme to reflow furnaces at all Fujitsu sites, a move that is projected to cut annual energy costs by 12,000,000yen and CO2 emissions by 320 tons.

Overview of "Just-in-Time" Conversion of a Reflow Soldering Furnace



Case Study

Reducing Compressor Power Consumption by Cutting Air Use at Product Warehouses

Fujitsu has moved to reduce wasteful use of air at production-related facilities, specifically product warehouses. This initiative is designed to reduce energy consumption from compressors by lowering the use of compressed air at factories. Previously, to prevent moisture levels inside desiccators (industrial dryers) from rising, a fixed and often excess supply of air was piped in irrespective of moisture levels within the warehouse. With the installation of sensors to detect moisture, we are striving for more optimized air usage by automatically controlling the volume of air supplied. To prevent moist outside air from getting in and to reduce air leaks, we apply draft-sealing tape to entryways and take other steps to keep facilities airtight. These measures have reduced air usage by roughly 50% compared to pre-improvement levels.

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

In the Green Process activities at semiconductor fabrication factories, 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 approach in those activities as well.

Cost Green (CG) Index

We employ an originally developed "Cost Green (CG) Index" that can identify materials for which targeted measures would be most effective in terms of both cost and environmental burden. The index is calculated by multiplying three numerical values for each material, including chemicals and gases-the unit price, volume used per product unit, and degree of environmental impact determined in-house. The number derived then forms the basis for reduction activities.

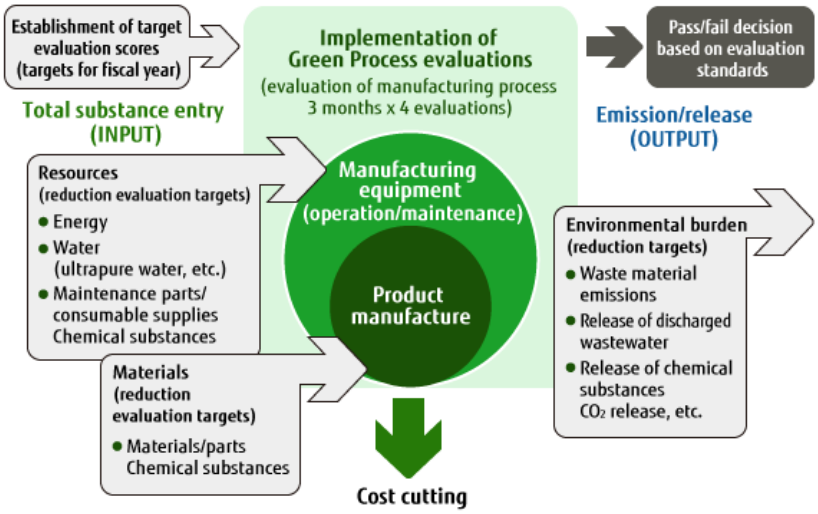
Method for Calculating Cost Green (CG) Value

This index describes the product of input volume used per product, the cost, and the environmental impact*1

*1 Environmental impact :
Measured on a scale of 1 to 10, with higher scores denoting worse environmental performance

Adoption Benefits

- **Reduced Environmental Impact from Factory Inputs**
  Reducing inputs such as raw materials, chemical substances and energy in upstream manufacturing activities makes it possible to reduce waste, chemical substances and energy consumption efficiently, and to thereby further reduce a manufacturing site's environmental impact.
- **Reduced Manufacturing Costs**
  Total inputs, including raw materials, chemical substances and energy, can be tracked and reduced, so operational benefits in the form of reduced manufacturing costs can also be expected.
- **New Assessment Indicators for Manufacturing Processes**
  Cost reductions, quality improvements, and delivery deadline compliance, the main assessment items for manufacturing processes, are joined by a new item, environmental impact reduction, which generates new added value. Activities will be carried out on an ongoing basis, with each factory setting targets and assessing relative achievement every quarter for each manufacturing line.



Case Study

Reducing Sealing Plastic with New Molding Technology
Fujitsu Integrated Microtechnology Ltd.

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

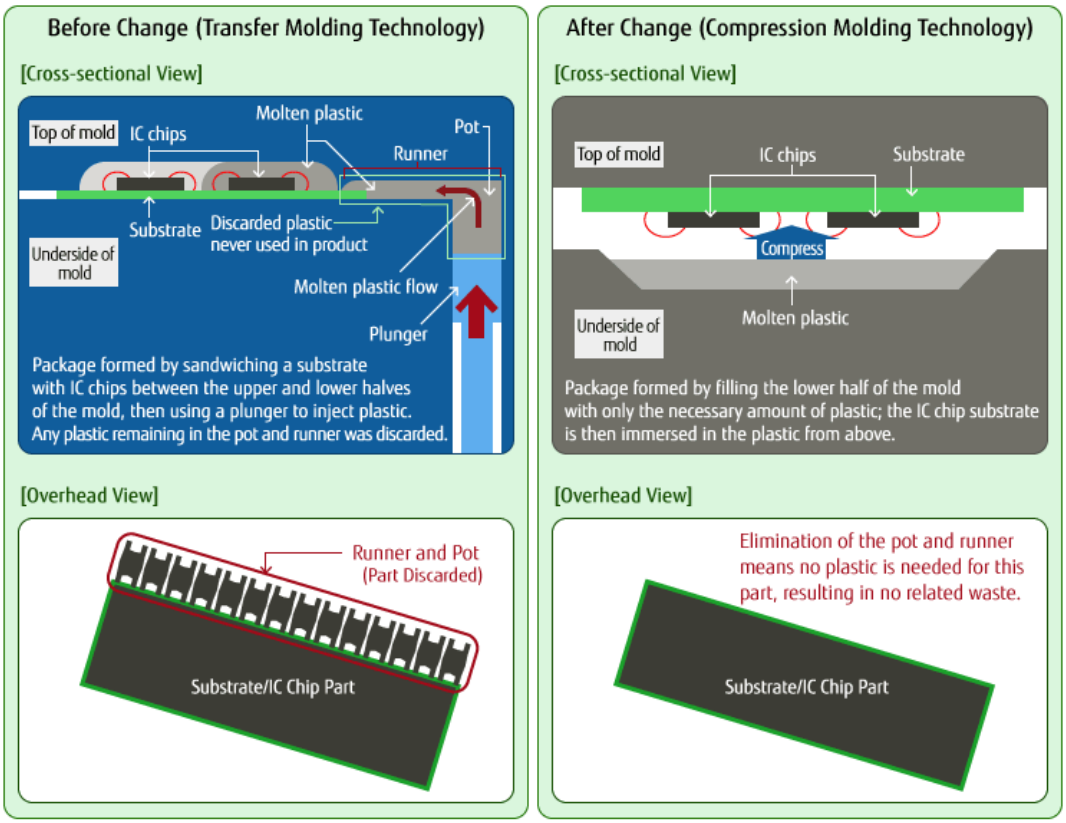
For example, the Miyagi Plant has instituted a new compression molding technology for the molding process in the IC chip packaging process (process for sealing chips with plastic), replacing the transfer molding technology that has been widely used to date. This has eliminated sealing plastic that had gone to waste and has reduced plastic usage and waste volume.

With conventional transfer molding technology, the process involved injecting plastic from a hole called a pot through which a plastic tablet is pressed and through a narrow tube called a runner to the chip. As a result of this process, plastic would remain on the pot and the runner, and this would become waste.

The new compression molding technology inputs only the necessary amount of plastic in a mold on the underside and then submerses the IC chip substrate into the plastic from the top and compresses it to perform the molding process, which renders conventional pots and runners unnecessary. This eliminates the plastic that had remained on those parts and thrown out as waste.

Moreover, switching to the new method has reduced bonding wire deformation, which had occurred when melted plastic was poured through, and has enabled more surface area of the substrate to be sealed at once, improving both quality and efficiency.

Since October, when the new technology was applied, plastic use has declined per unit of production (per component) in processes using the new method compared to before. In particular, since November, production volume has been increased and both CG values and resin costs per component have declined by 25-40% range, close to the rate that was expected (roughly 36%).



- Green Process : Case Study Archives

Reducing the Amount of Waste Generated

Basic Approach

Working towards a recycling-minded society, our 3R*2 policy encourages all employees to separate waste materials into different categories for effective recycling.

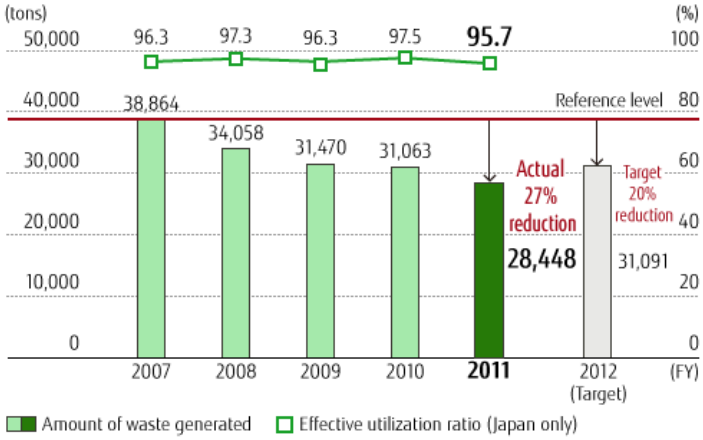
*2 3R :
Reduce, Reuse, and Recycle

FY 2011 Performance

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

We generated 28,448 tons of waste (per unit of actual sales: 0.064 tons/billion yen) in FY 2011, which was an 8.4% reduction from the previous fiscal year's level and a 27.0% reduction from the FY 2007 level. The reasons for these reductions include the conversion of waste paper and waste acid to valuable materials, and in-house processing of alkali wastewater.

Amount of Waste Generated



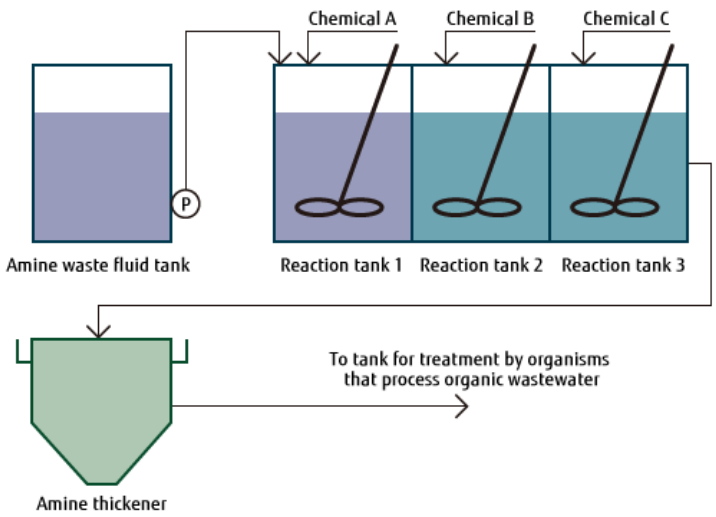
Case Study

Shinko Electric Industries Co., Ltd.
Internal Processing of Organic Amine Waste Fluids

Shinko Electric Industries Co., Ltd. previously processed all the waste stripping fluid (organic amine alkali chemicals) that was used to strip dry film laminate, which is necessary for patterning (a semiconductor production process), as industrial waste.

After repeated experimentation, the company established an internal processing technology and succeeded in making it possible to process the waste fluid in-house. As a result, industrial waste volume was reduced by 777 tons annually.

Method for Internal Processing of Amine Group Organic Alkali Waste Fluids



- Reducing the Amount of Waste Generated : Case Study Archives

Achieving Zero Emissions at Domestic Group Companies

The Fujitsu Group promotes zero emissions*3 activities at Group companies in Japan. One business location did not achieve zero emissions status. We will continue considering ways to achieve zero emissions at this location.

*3 Zero emissions :
Refers to effectively using 100% of waste and eliminating waste earmarked for landfills or simple incineration.

Effective Use of Water Resources

Basic Approach

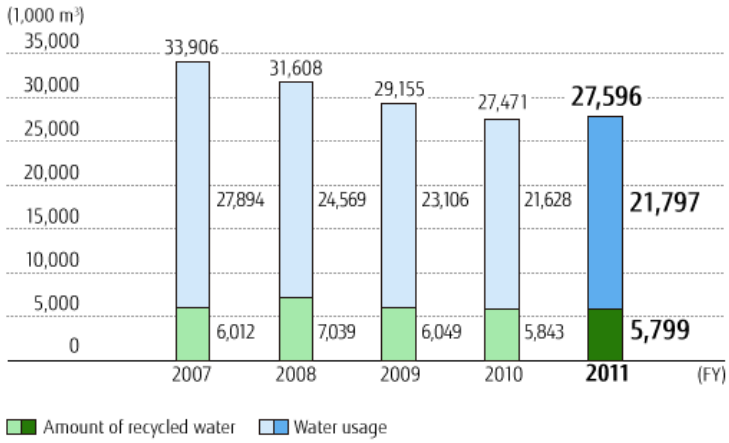
We are working to reduce our use of water resources through recycling and reuse of service water, the use of rainwater, and other measures.

Results for FY 2011

Our water use for FY 2011 was 21,797 thousand cubic meters (per unit of actual sales: 49 cubic meters/billion yen). This was 0.8% higher than FY 2010 but 5.7% lower than FY 2009.

The ratio of recycled water to total water use was 26.6% in FY 2011, which was about the same level as the 27.0% ratio in FY 2010.

Trends in Water Use



Chemical Substances Management

Basic Approach

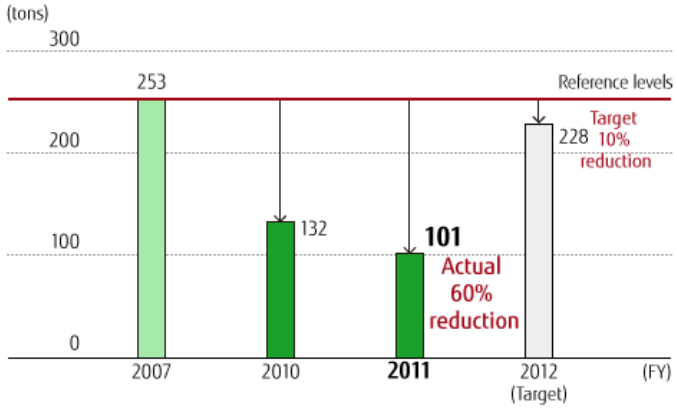
Prevention of environmental risks that could lead to environmental pollution or adverse health effects due to the use of harmful chemical substances has been established as our basic policy for chemical substances management. We manage the amounts used for about 1,300 chemicals, and we work to reduce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

Results for FY 2011

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 2011 were 101 tons, which was a 60% 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 PRTR 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.

Compliance with the Revised Chemical Management Law

Following revisions to the Chemical Management Law*4, more chemical substances are now covered by the MSDS*5 system and the PRTR*6 system (revisions applied to the MSDS system from October 2009, and to the PRTR system from April 2010).

Responding to these revisions, the Fujitsu Group has asked its suppliers to cooperate in the delivery of chemicals, and based on the revised PRTR system it is carrying out initiatives to obtain an accurate grasp of the amounts of chemicals transported and emitted. Emissions of chemical substances covered by the PRTR system were 24 tons, and per unit of actual sales were 0.054kg/billion yen).

*4 Chemical Management Law :
A law to promote correct understanding, management, and reporting of amounts of designated chemicals emitted into the environment

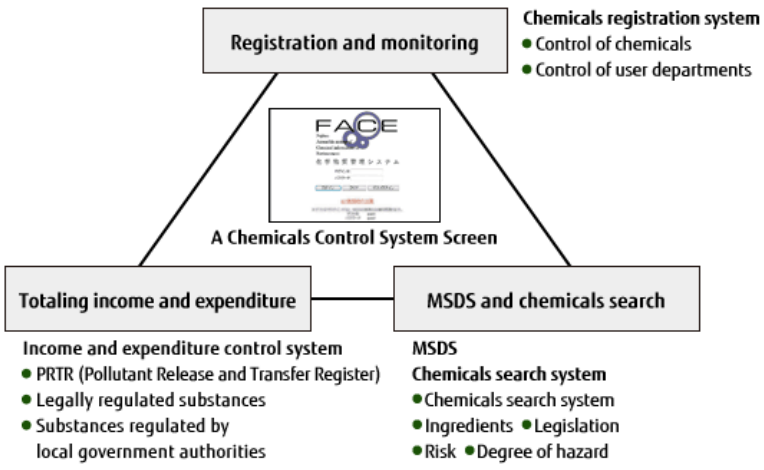
*5 MSDS :
A system that requires attachment of a Material Safety Data Sheet to chemical deliveries

*6 PRTR :
Abbreviation of Pollutant Release and Transfer Register. This system requires the registration and reporting of data relating to the emission of harmful chemicals into the environment and volumes within transported waste.

Operation of "FACE," the Chemical Infomation System

The Fujitsu Group operates a Chemical Information System called "FACE." It can be used not only to register and monitor chemicals at every site but also to manage MSDS and control income and expenditure in conjunction with purchasing data and inventory data, FACE is helping the Group to strengthen its chemicals data and make it more efficient.

Overview of Chemicals Control System



- Basic Policy for Chemical Substances Management : Case Study Archives

Preventing Air and Water Pollution

Preventing Air Pollution

We have set voluntary controls that are more stringent than emissions standards under related laws and ordinances in order to prevent air pollution and limit acid rain. Regular measurement and monitoring is conducted based on these controls. Efforts are made to appropriately process sulfur oxide, nitrogen oxide and other harmful substances and reduce emissions through measures such as controlling incineration at facilities that emit smoke, using fuels with low sulfur content, and managing operations at exhaust gas processing facilities. In addition, emission of dioxins has been prevented by suspending use of (completely phasing out) all in-house incineration facilities as of January 2000.

Preventing Water Pollution

In order to preserve the water quality of surrounding waterways, including rivers, groundwater and sewers, we have set voluntary controls that are even tougher than related laws and ordinances and conduct regular measurement and monitoring on this basis. We are working to appropriately process harmful substances and other regulated substances (COD, BOD, etc.) and reduce discharges of them by ensuring appropriate chemical use, preventing chemical leaks and permeation, and managing the operations of water treatment and purification facilities, among other measures.

Preventing Ozone Layer Depletion

Elimination of Ozone-depleting Substances

The Fujitsu Group has completely eliminated use of ozone-depleting substances in manufacturing processes (parts cleaners and solvents) by utilizing precision aqueous cleaning systems and no-clean soldering technologies. Refrigerant CFCs used in air conditioning equipment (freezers, etc.) are being replaced with non-CFC refrigerants when equipment is upgraded, and measures are also taken to prevent leaks.

Achievements in Abolishing Ozone-depleting Substances

Ozone-depleting substance	Date of elimination
Cleaning freons (CFC-113, CFC-115)	End of 1992
Carbon tetrachloride	End of 1992
1,1,1-trichloroethane	End of October 1994
Substitute freons (HCFCs)	End of March 1999

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 in this area from a medium- to long-term perspective. To achieve this, at the end of FY 2011 we recorded as a liability on the Group's consolidated balance sheet 8.94 billion yen in soil-pollution cleanup costs, high-level polychlorinated biphenyl (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 (additional costs likely forthcoming with the recent detection of PCB in monitoring wells at the Suzaka Plant).

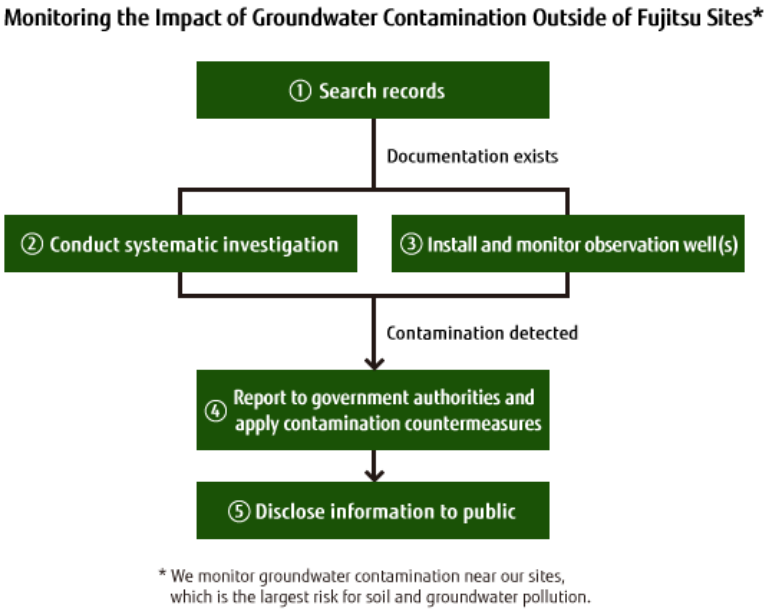
For processing waste with high levels of PCBs (transformers and capacitors), we have registered in advance with Japan Environmental Safety Corporation (JESCO), which processes PCB waste under Japanese government supervision, and perform this processing based on JESCO plans.

Preventing Soil and Groundwater Pollution

Fujitsu conducts soil and groundwater contamination surveys, implements countermeasures, and discloses the resulting data.

Basic Approach

We review as necessary 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, in parallel with performing planned surveys and, if contamination 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.



Status of New Soil and Groundwater Pollution Measures Undertaken in FY 2011

A voluntary survey in FY 2011 revealed soil and groundwater contamination at one site. We reported the state of contamination at this site and explained our countermeasures to local citizen and authorities.

- Groundwater Contamination Survey Results and Status of Cleanup Measures at Fujitsu Group Business Sites in Japan (in Japanese) [250KB]

Measures to Clean Up Soil and Groundwater Pollution Due to Past Business Activities

We have dug wells to monitor groundwater contamination near our sites where soil or groundwater pollution has been found. We continuously monitored seven such sites in FY 2011.

The table below lists the largest of the most recent measurements for chemicals with levels recognized to have exceeded legal limits in FY 2011 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 counting to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	5.3	0.04
Oyama Plant	Oyama City, Tochigi Prefecture	We are counting to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	6.107	0.04
			Trichloroethylene	0.043	0.03
Nagano Plant	Nagano City, Nagano Prefecture	We are counting to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	0.21	0.04
Suzaka Plant*1	Suzaka City, Nagano Prefecture	Soil survey underway to determine cause of contamination	Polychlorinated biphenyl	0.0028	Must not be detected
Shinetsu Fujitsu	Shinano machi, Kamiminochi Gun, Nagano Prefecture	We are counting to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	0.12	0.04
Fujitsu Optical Components	Oyama City, Tochigi Prefecture	We are counting to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	0.13	0.04
			Trichloroethylene	0.172	0.03
FDK Sanyo plant	Sanyo-Onoda City, Yamaguchi Prefecture	We are counting to clean up VOCs by pumping and aeration.	Cis-1, 2-dichloroethylene	0.055	0.04
			Trichloroethylene	0.12	0.03
FDK Washizu Plant	Washizu, Kosai City, Shizuoka Prefecture	We are counting to clean up VOCs by pumping and aeration.	Trichloroethylene	0.17	0.03
			Tetrachloroethylene	0.06	0.01

*1 Suzaka Plant :
Contamination was confirmed at the Suzaka Plant in FY 2011. However, because countermeasures were scheduled to begin in FY 2012, it was not included in the number of business sites with ongoing cleanup and countermeasures.

Environmental Activities in Offices

We strictly observe all laws concerning the environment and also work to save energy and achieve zero waste emissions, not only at our production sites but also at all our business offices.

Green Office Systems

Along with ensuring legal compliance with environmental regulations, the Fujitsu Group vigorously promotes environmental activities at its business offices, including efforts to save energy, achieve zero waste emissions and contribute to society.

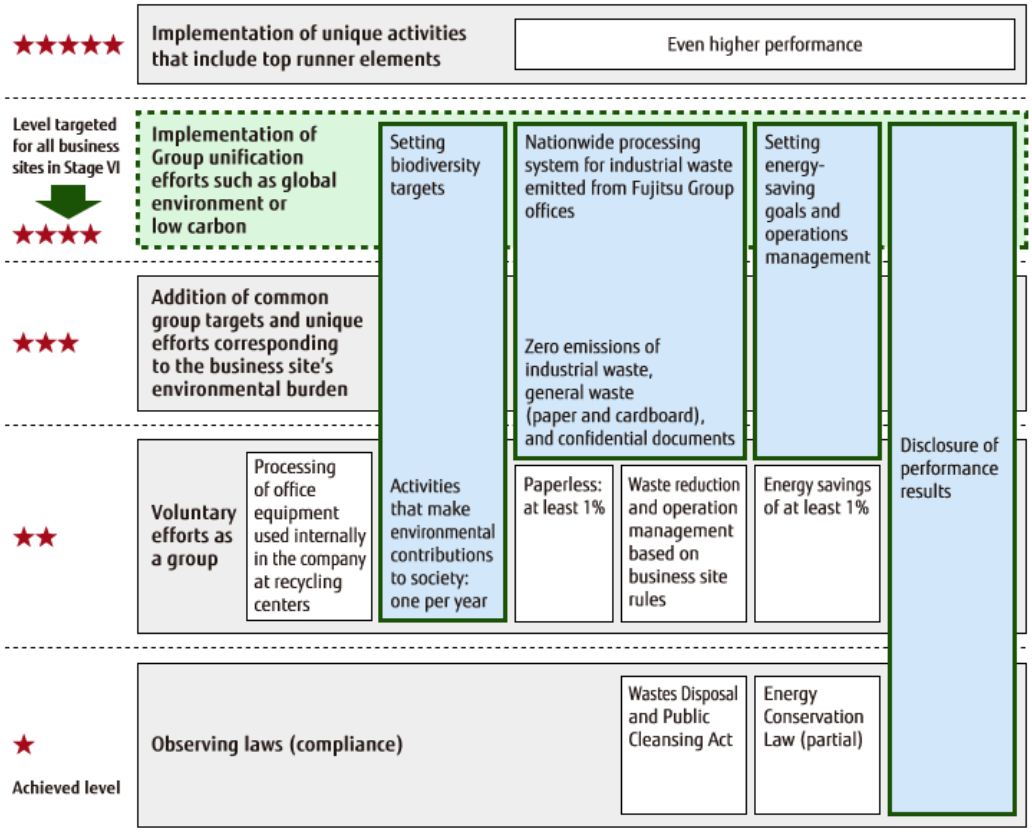
As part of this effort, we initiated our Green Office system in FY 2007. This system comprehensively evaluates aspects such as the level of environmental consideration and independent efforts at each office, and renders visible this evaluation by assigning one of three levels in the Fujitsu Group Environmental 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 worked 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*1 of waste materials from all 371 sites, in what was the largest effort of its kind in Japan.

In the Fujitsu Group Environmental Protection Program (Stage VI), which started in 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, in tandem with initiating activities to achieve this goal, we sought 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 FY 2011 we collected system proposals based on the results of this survey and are looking into implementing trials based on those proposals in FY 2012.

By operating this system, we plan to render visible the details of the activities carried out by our offices, construct databases that allow the activities to be shared with and rolled out to other offices, and thereby continue to raise the level of environmental activities throughout the Fujitsu Group.

*1 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



Creating a Database of Environmental Activity Measures, and Utilizing Checklists

Through Green Office system implementation, we check and create a database of the progress and status of measures targeting energy efficiency, waste reduction, paperless operations and other goals at all applicable offices, and produce a checklist of key measures.

These checklists are proving useful not only as a reference for potential measures to adopt when offices set their environmental objectives and targets, but also for invigorating and enhancing activities by making visible operational improvement issues and measures that require investment.

Reducing Waste from Offices

On-Site Waste Disposal Auditing

The major environmental law to which all offices in Japan are subject is the Waste Management and Public Cleansing Act.

To confirm that ICT equipment and other types of industrial waste are being properly dealt with, the Fujitsu Group has developed and operates a structure under which Fujitsu Recycling Centers, as waste processing specialists for in-house ICT equipment, have been established wherever Group companies operate. Under this framework, we perform standardized Group-level checks through periodic, on-site audits. Specifically, a member of the Fujitsu Corporate Environmental Strategy Unit visits the recycling centers 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.

In addition, to sustain and improve security levels with respect to confidential document disposal, we implement on-site validation once a year of Japan Security and Recycle Network, a company that processes confidential documents based on a nationwide paper recycling system.

- Reducing the Waste Generated in Office : Case Study Archives

Reducing CO2 Emissions in Offices

Efforts by the Fujitsu Group to reduce CO2 emissions are guided mainly by promotion of the measures detailed below.

- Energy-saving equipment measures (for Group-owned buildings)
- Adjust appropriate room temperature for office air conditioning (28°C in summer and 20°C in winter)
- Extinguish unnecessary lighting, shorten air-conditioner use outside of regular work hours (uniform quitting time, etc.)
- Set energy-saving mode for PCs, turn off display when away from desk
- Turn off standby mode power in AC adapters, use smart power sockets
- Implement nighttime operation control for PCs, shared terminals, development terminals and other equipment
- Consolidated access points
- Perform in-house and request external evaluations of energy efficiency

Case Study

Fujitsu Finland Head Office Granted the WWF Green Office Logo

The head office of Fujitsu Finland Oy has been granted the WWF Green Office logo. To meet the qualifications for this recognition the company had to conduct environmental assessments, establish environmental targets, demonstrate tangible environmental achievements and take an active stance in internal environmental communication. Moreover, before being granted the Green Office diploma, the company had to pass an office inspection by a WWF Green Office expert.

Fujitsu Finland remains committed to taking assertive action to contribute to the global environmental activities of the Fujitsu Group.

Green Office Logo

Case Study

Videoconferencing System Brings Good Global Communication

Fujitsu Technology Solutions, based in Germany, has installed videoconferencing systems in 49 of its key offices, connecting its businesses across the European continent, the Middle East, Africa, and India. This move is intended to improve global communications, and reduce the time and carbon footprint required for business travel.

Over 2,000 video conferences have been held since the system began operating on December 1, 2011, through the end of April 2012. Use of the system has grown steadily since its introduction, and employees participating in video conferences have experienced better communications, while improving day-to-day productivity without having to actually visit distant offices.

The company's domestic German sales division used the system for its FY 2012 kick-off meeting, with over 600 people at 11 locations participating by video conference. This event is designed to raise employee motivation and build team cohesion, and the system helped the speech by CEO Rolf Schwirz come alive for the participants. The system has thus been extremely useful not only in improving communications, but in enhancing cooperation among teams scattered across multiple locations.

- Reducing CO2 Emission in Offices : Case Study Archives

Green Procurement with a Centralized Global Procurement System

To provide our customers with products and services that have minimal environmental impact, the Fujitsu Group is promoting green procurement together with our business partners through a centralized global procurement system as it strives to protect the global environment.

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, as we strive to protect the global environment.

- Fujitsu Group Green Procurement Direction

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*1

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. To assist those partners unable to establish certified EMS in a short timeframe, we provide them with the Fujitsu Group's own EMS, and offer support until certification is obtained. We also periodically survey the status of their EMS implementation by using our original survey form.

*1 EMS:
Environmental management system

Promoting Our Business Partners' Efforts to Limit or Reduce CO2 Emissions and to Conserve Biodiversity

We have been promoting the limitation or reduction of CO2 emissions and the conservation of biodiversity under the Fujitsu Group Environmental Protection Program (Stage VI) (FY 2010 to FY 2012), and we ask all of our business partners to implement activities regarding these two themes. In this way, the Fujitsu Group is working to embed its environmental initiatives across the entire supply chain.

We have set a target of 100% implementation (based on the number of companies) 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 to assess the initiative stage of our business partners' actions, and request that they carry out activities in line with this index to achieve the target.

To encourage business partners to limit or reduce CO2 emissions, we have created a tool that enables them to calculate emissions from power consumption. The tool features a function that automatically calculates CO2 reduction plans each month. In particular, business

partners that previously did not have quantitative targets for CO2 emissions reductions are now using the tool to ascertain their current emissions and formulate new reduction targets.

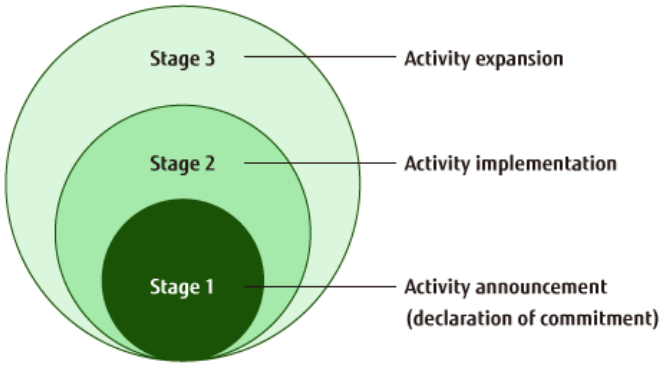
We provided business partners with our guidelines for biodiversity conservation, introducing detailed informative explanations of activities and typical activity examples, and our checklist tool that readily evaluates the current status of their activities. These materials are intended to facilitate understanding of the importance of biodiversity conservation, instill awareness of the relationship between everyday environmental activities and biodiversity, and encourage business partners to tackle the issue in a highly accessible way.

We not only ask business partners to engage in initiatives, we also hold seminars on these two subjects to discuss why efforts are necessary and where to begin while providing specific examples. In FY 2010 and FY 2011, a total of seven seminars were held, in 70 business partners participated.

As result of these efforts, we achieved an implementation rate of over 80%, our target for the end of FY 2011. We are aiming for 100% in FY 2012, strengthening ties with business partners in order to make further improvements in these areas.

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.



TOPICS

Participatory Environmental Protection Activities for Business Partners

On October 30, 2011, the environmental protection activity led by the Purchasing Unit was held at the Higashitoyoda Nature Preserve in Hino, Tokyo, and elicited the participation of numerous business partners. The Fujitsu Group has conducted many environmental protection activities, but this was the first involving the direct participation of business partners.

The activities were planned and held to serve as a springboard for business partners to launch their own biodiversity conservation initiatives.

Thirteen people from ten business partners participated, and a total of 15 people from Fujitsu took part as well, including the presidents of the Purchasing Unit and Corporate Environmental Strategies Unit, and middle managers from the Purchasing Unit. The day's activities included cutting down bamboo grass and clearing away fallen trees. During breaks in the work, nature observations were conducted in the preserve, which renewed awareness of the importance of regular, manual woodland preservation activities. Fujitsu intends to continue this kind of activity going forward.

Environmental protection activities

Establishment of Our Business Partners' CMS*2

We request our business partners to establish a chemical substances management system (CMS) based on the JAMP*3 guidelines on management of chemical substances contained in products. If their management system is inadequate when we audit their manufacturing sites for parts supplied to the Fujitsu Group, we will provide support for correctional efforts that aim to strengthen their management system in the supply chain. Once business partners were recognized a CMS has been established, we periodically check the operational status of the system. The Fujitsu Group will continue CMS development efforts of this kind to ensure that strict legal compliance is maintained.

*2 CMS:
Chemical substances management system

*3 JAMP:
Joint Article Management Promotion-consortium

Collaborating with Business Partners in Chemical Substances Management

In order to comply with new chemical regulations in Japan and globally, starting with Europe's REACH regulations, we started surveys in June 2011 based on the AIS*4 and MSDSplus*5 formulated by JAMP. Ahead of the surveys, in May, Fujitsu held seminars on creating AIS sheets for 73 processing-related business partners in Japan. And in June, we also held seminars for 17 business partners in greater China. The seminars included computer-based study and instruction on how to prepare AIS sheets.


A seminar held in Japan

ProcureMART*6, a Fujitsu Group product for online procurement, is used to connect the Fujitsu Group with its business partners, which enables purchasing activities and chemical substance surveys to be conducted with a single interface. Management of chemical substance information sent from business partners is accomplished by utilizing another Fujitsu Group product, PLEMIA/ECODUCE*7, and information is shared within the Group.

The Fujitsu Group is actively involved in standardization activities for green procurement surveys being promoted by industry bodies like JAMP. We intend to continue raising the efficiency of such supply chain surveys going forward.

*4 AIS:
Information transmission sheet for conveying information on chemical substances in molded products.

*5 MSDSplus:
Information transmission sheet for conveying information on chemical substances in chemicals and preparations.

*6 ProcureMART:
Service that allows procurement processes for production materials to be conducted online.

*7 PLEMIA/ECODUCE:
Fujitsu's chemical substance management system

Raising Product Value with Environmental Technologies (Soliciting Proposals for Environmental Technologies)

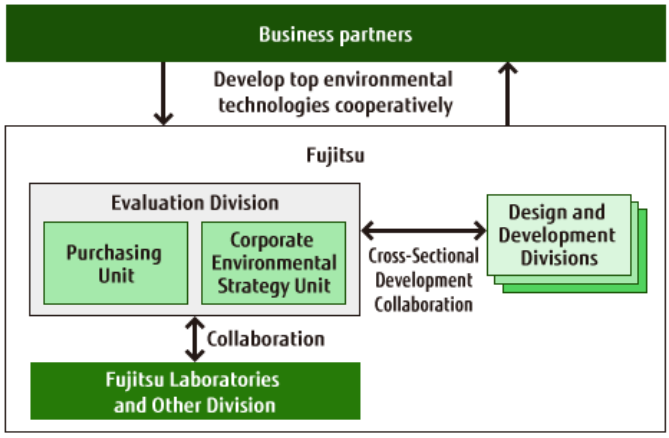
Fujitsu solicits proposals from business partners on environmental technologies and materials to achieve Green Policy Innovation, our project to help customers reduce their environmental impact using Green ICT. Outstanding proposals are suggested to design and development divisions for timely, horizontal adoption across Fujitsu.

Proposals made by business partners are evaluated in our specialist divisions and exceptional proposals are considered for adoption. All information is stored in an internal database that can be accessed and further developed across Fujitsu. We remain committed to proactively adopting outstanding environmental technologies and materials, and will continue to develop and promote products with exceptional environmental performance.

Refer to the following URL for details on the types of environmental technologies Fujitsu is seeking and how proposals are made.

- About the Environmental Technologies Proposal Application

Infrastructure for Achieving Green Policy Innovation



Environmental Considerations in Transportation

We are promoting the rationalization and streamlining of transportation while keeping the whole global supply chain in mind. We are also working to reduce the CO2 emissions associated with transportation.

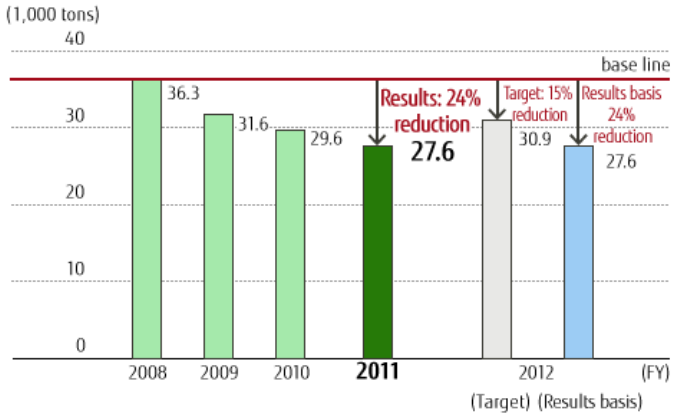
Promoting Global Green Logistics Activity

We are working on Green Logistics Activities which strive to reduce CO2 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 collaborations with our business partners and strive to reduce the environmental burden associated with distribution across the whole supply chain.

Our goal was to reduce CO2 emissions in domestic distribution by 15% 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 a 24% reduction (this includes fluctuations in amounts distributed and the effects of the March 2011 earthquake) compared to FY 2008 in FY 2011. Our CO2 reduction efforts will continue in FY 2012, with sights set on a 24% reduction relative to FY 2008 based on the latest distribution volume data.

We have also started to measure the CO2 emissions in international transportation and the transportation CO2 emissions at overseas sites, and thus are promoting green distribution activities globally.

Trends in CO_2 Emissions from Domestic Transportation in Japan (Fujitsu Group)



Expanding Modal Shifts

The Fujitsu Group is working to reduce CO2 emissions through an ongoing modal shift. This entails effectively utilizing rail transport and switching from air to surface transport in everything from procurement of parts and materials to product distribution.

Fujitsu acquired Eco Rail Mark certification in March 2011, and we will continue to vigorously promote the use of rail transport in FY 2012.

In FY 2011, we further promoted expanded use of rail transport by switching from truck to rail for shipments to KDDI Corp., in addition to shipments for NTT DOCOMO, INC.

Reducing Truck Numbers

In November 2011 we began revising our domestic transport network for personal computers for individual customers and consolidated routes with Tokyo as the hub. This has allowed us to transport computers for individuals together with personal computers for corporate customers on main transport lines from our factories to Tokyo, increasing truck load rates and reducing truck numbers.

Innovations in Maintenance Logistics Service Infrastructure

Fujitsu is working to improve customer service and promote environmentally sensitive green logistics through innovations in maintenance parts and service infrastructure. As part of these efforts, we are relocating parts centers that manage maintenance parts nationwide. Moving parts centers closer to customers and field customer engineers (CEs) has enabled us to shorten the time required to deliver parts to customers.

In addition, we are also promoting an approach in which field CEs go to parts centers and carry back maintenance parts with them, which also serves to reduce the delivery time from parts center to customer while cutting CO2 emissions.

International Transport Initiatives

The Fujitsu Group began measuring CO2 emissions from international transport in FY 2008, and is now actively working to reduce emission levels.

Our activities include modal shifts (shifting from air to ocean transport), shortening transport distances, raising container packing rates, and reducing air transport frequency.

Loading a container

Fujitsu Ten Ltd. uses a loading method that effectively utilizes container space by standardizing previously irregular sizes of outer packaging for international transport between Group companies and for procured materials. This initiative was then extended to shipments originating with overseas suppliers, which has served to further reduce the number of containers used.

Initiatives at Group Companies

At major Group companies in Europe, North America and APAC, we have begun measuring CO2 emissions from international and regional transport.

Fujitsu Technology Solutions (FTS) is promoting green logistics activities by measuring CO2 emissions related to the transport and taking steps to reduce them.

Shorter Product Transport Distances

FTS is reducing transportation distances by evaluating and conducting direct shipments wherever and whenever possible. For computer displays, typical examples of reduced distances are China to the Middle East, China to Turkey and China to South Africa. For PRIMERGY servers, we were able to route shipments directly from Japan to the APAC region instead of routing them from Japan to Germany and then to APAC. In Germany, we established direct shipments from the factory in Augsburg to the customer without passing through any distribution centers.

Promoting Modal Shifts

We are shifting transport volumes from air freight to sea or rail transportation. Specifically, we were able to increase the sea freight share from Asia to Europe (shift from air to sea) for components used in our FTS factory. In addition, we increased the transport by rail of computer systems from Germany to Mongolia (shift from air to rail).

Packaging and Container Loading Improvements

Efforts to optimize transport volumes by improving package shapes and packing methods are resulting in a higher degree of capacity utilization. Examples for products and routes are mobile base units shipped by sea freight from China to Germany, and a reduction in CTO LIFEBOOK packaging for air freight from Japan to Germany.

Consolidating Shipments for More Efficient Transport

Consolidation of several smaller consignments into one bundled shipment, either by aligning order volume or collecting smaller shipments from different suppliers, results in fullcontainer loads. This approach was used for the sea freight route from China to Germany, with the bundling of several small component consignments into one container load.

Reducing the Use of Cardboard and other Packaging Materials

To reduce the whole environmental burden of the distribution process, we are promoting 3R*1 efforts for packaging products and parts.

Reducing the Use of Cardboard and other Packaging Materials

The Fujitsu Group has been replacing cardboard and other materials used to package products with reusable alternatives. This has reduced the use of cardboard and other cushioning packaging materials.

GreenEcoBelt*2

*1 3R:
Reduce, Reuse, and Recycle

*2 GreenEcoBelt:
Jointly developed by DHL Supply Chain Ltd. and EcoBiz Co., Ltd.

Information and communications technology (ICT) can be a powerful tool for biodiversity conservation. The Fujitsu Group is striving to employ ICT in biodiversity conservation initiatives in various fields.

Putting ICT to Work in Biodiversity Conservation

ICT excels at tasks like efficiently collecting, analyzing, and interpreting voluminous data, as well as using such data to optimize work processes. These characteristics can also be of great use in biodiversity conservation. For instance, ICT can be utilized on the preservation frontlines not only to enable efficient work but also to yield greater results. The Fujitsu Group is working on new ICT applications for biodiversity conservation.

ICT in Action 1	ICT in Action 2	ICT in Action 3
Goal: Evaluate the Effectiveness of Natural Feeding Grounds for Japanese Cranes	Goal: Harvest Top-Quality Grapes	Goal: Make Time-Consuming Professional Vegetation Surveys Fun and Easy

ICT in Action 1: Goal: Evaluate the Effectiveness of Natural Feeding Grounds for Japanese Cranes

Japanese Crane Conservation Project in Hokkaido's Tsurui Village

Natural Feeding Grounds for Japanese Cranes

A special national treasure, the Japanese crane, or tancho, is designated as a vulnerable species. The Wild Bird Society of Japan set up natural feeding grounds for this species at its Tsurui-Ito Tancho Sanctuary in Hokkaido's Tsurui Village in hopes of preventing its extinction due to the spread of infectious diseases at crowded feeding stations during the winter. However, accurate studies on the use and effectiveness of the natural feeding locations were needed.

Researchers had been using the time-consuming method of setting up video cameras in the field for subsequent retrieval, so investigations were limited to roughly biweekly studies for each location. To assist, Fujitsu installed a video surveillance system that leveraged a multi-sensing network. This enabled the Japanese cranes' activities to be recorded every 10 minutes and the data to be transferred to a nature center. The leap in survey accuracy also newly revealed that feeding sites are actually used by multiple flocks of cranes, whereas it had previously been thought that each flock claimed exclusive territory for feeding.

In addition to ongoing video monitoring of the sanctuary's natural feeding grounds, the project will serve as a platform for enlightening the public on Japanese crane conservation and community network-building. Specifically, tie-ups with organizations like local elementary and junior high schools will be used to promote environmental education, while tourism will also be leveraged to disperse information.

VOICE

Chief Ranger, Wild Bird Society of Japan Preservation Projects Tsurui-Ito Tancho Sanctuary
Shigeo Arita

Japanese cranes depend on human feeding during the winter. The Wild Bird Society of Japan is working with volunteers from around the country to create natural winter feeding grounds so that the cranes can forage for food on their own in the wild.

Thanks to installation of the multi-sensing network, we can continuously monitor the feeding grounds. This helps us gauge the effectiveness of our conservation efforts as well as make improvements. We will use the system to expand our initiatives to preserve Japanese cranes' wintering grounds.

- Fujitsu Supports ICT-Enabled Japanese Crane Conservation in the Kushiro Wetland Area [Press Release]
- Activities Report: Actions to Protect Japanese Cranes Near the Kushiro Marshlands(in Japanese)

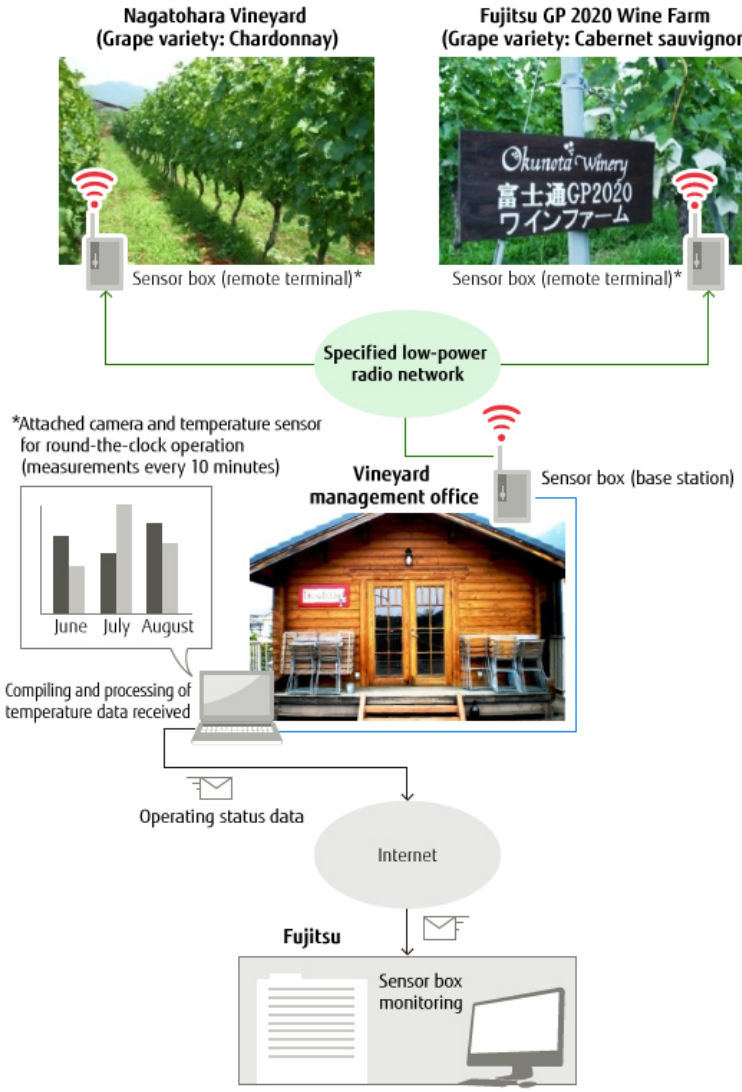
ICT in Action 2: Goal: Harvest Top-Quality Grapes

Vineyard Temperature-Sensing Project in Yamanashi Prefecture's Kofu City

Wine vineyards in Kofu City, Yamanashi Prefecture bloom in mid-June and approach harvest in September. Vineyard temperatures play a major role in determining optimum harvest and pest-control timelines. For example, the best time to pick grapes for winemaking can be determined from the cumulative difference between the daily high and low temperatures since the flowering date. In addition, grape pigment levels can be determined from the cumulative duration of time each day when the temperature drops below 22 degrees Celsius from the hottest summer day to the harvest date. However, due to the difficulty in acquiring detailed and accurate temperature data, farmers had been relying on long years of experience and instinct to make these decisions.

Fujitsu launched a temperature-sensing field trial in June 2011, spurred by a consultation about temperature measurement from a vineyard where its employees had been participating in an agriculture experience program. Utilizing a multi-sensing network, we outfitted the vineyard with sensor boxes from which the administrative office received temperature data every 10 minutes around the clock. We also utilized a temperature data collection and analysis program to realize accurate assessment of vineyard temperature trends.

Using these sensing methods substantially reduced temperature measurement man-hours. Accurate temperature data also enabled effective pest control, which led to better wine quality and less pesticide use. In fiscal 2012, we will take the ongoing agricultural sensing system field study to the next level by adding rain and humidity gauges as part of efforts to contribute to ICT use in agriculture.



VOICE

Representative Director, Okunota Winery
Masakazu Nakamura

The installation of a multi-sensing network has now made it possible to check changes in temperature at the vineyard every 10 minutes without ever leaving our office. This benefit, in turn, has enabled us to take appropriate steps to fight off harmful microbes that could stunt grape growth. As a result, although the average wine vintage in Yamanashi Prefecture in 2011 was not very good, Okunota Winery was recently able to produce its finest vintage. In fiscal 2012, we are collecting data on measured rainfall and humidity as well. In this way, we are utilizing ICT in our quest to produce high-quality wine.

- Fujitsu Launches Sensor-based Agricultural Support Efforts at Wine Farm in Japan's Yamanashi Prefecture(in Japanese) [Press Release]

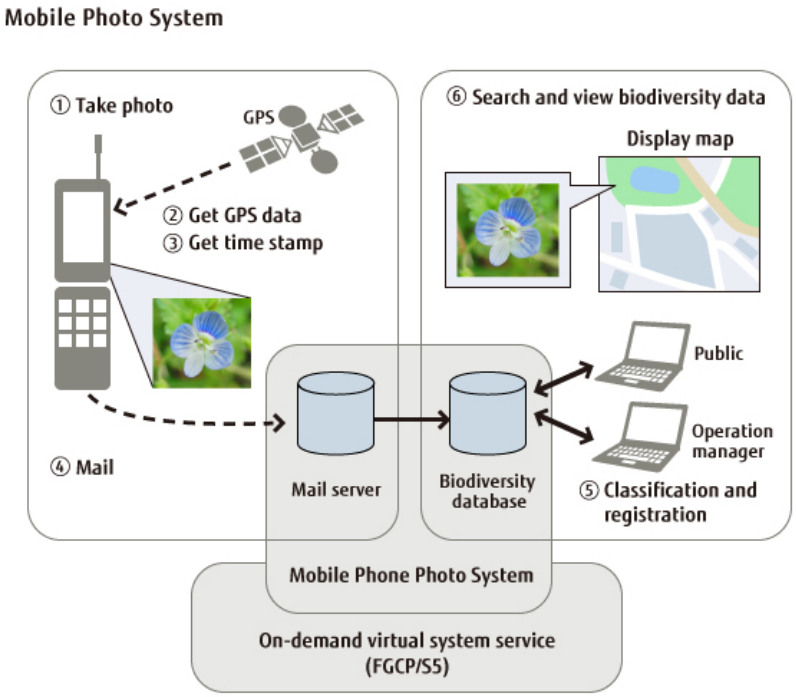
ICT in Action 3: Goal: Make Time-Consuming Professional Vegetation Surveys Fun and Easy

Tamagawa River Vegetation Survey Using Mobile Phone Photo System

It is important to have an accurate understanding of the wildlife and vegetation inhabiting a region when considering measures to conserve its biodiversity. This information has conventionally been obtained through studies led by experts who go out in the field and construct mesh maps of the area, but this process is extremely laborious and time-consuming. In 2011, Fujitsu set out to make vegetation studies easy and fun, utilizing photographs taken with GPS-equipped mobile phones to conduct a study of vegetation along the Tamagawa River in Kawasaki City in cooperation with the municipal government and NPOs.

For the survey, we divided around 28km of the Tamagawa River Basin in Kawasaki City into roughly 7km segments and participants into four groups to photograph the vegetation in each of the segments using mobile phones. One of the great things about this survey was that many people were able to participate and image and positional information was easily collected thanks to the use of everyday equipment-mobile phones. Things learned from the survey include that wild radishes only exist downstream of the Shintamagawa Bridge on Daisan Keihin Road, whereas wild chrysanthemums are only found upstream of the Tokyu Railway Toyoko Line bridge.

By continuing to leverage ICT to support vegetation surveys, the Fujitsu Group aims to make scholarly contributions to both vegetation taxonomy and conservation ecology, while sparking interest in biodiversity through activities in which a wide range of people can enjoy taking part.



VOICE

Assistant Manager for Coproduction Promotion, Tama River Policy Promotion Section, Greenery Development Department, Construction and Greenery Development Bureau, City of Kawasaki
Ryuji Inada

We are thankful for understanding and cooperation on the Tamagawa River vegetation survey, and are carrying out our operations in collaboration with the community while utilizing Fujitsu's ICT. Using familiar mobile phones to conduct the latest survey made it fun for all involved. Compiling survey results was also a breeze and it was clear that the system is easy for anyone to use. We intend to make good use of the survey results, while continuing to advocate partnerships with civic, corporate, and government organizations.

- Utilizing ICT in Tamagawa River Vegetation Surveys(in Japanese) [Press Release]

Conservation of Biodiversity

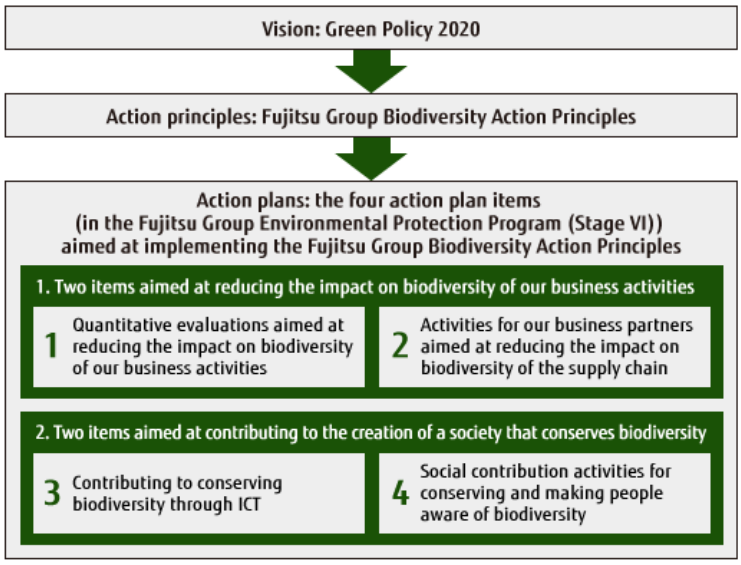
We have set conservation of biodiversity as a priority area in the Fujitsu Group Environmental Protection Program (Stage VI), and are promoting activities aimed at realizing this goal.

Basic Concepts

Only the bounty of nature makes our daily lives possible. From the provision of food and forests, to climate regulation, water purification and recreation, the value to humankind of the functions nature performs is 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 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. We then established four related action plan items in the Fujitsu Group Environmental Protection Program (Stage VI), which started in FY 2010.



- Fujitsu Group Biodiversity Action Principles

Conservation of Biodiversity in Our Business Activities

In the Fujitsu Group, we are trying to reduce the environmental burden that results from our business activities based on an awareness of the consequences our actions have for biodiversity.

We have prepared Group guidelines on biodiversity for all phases of a product's life cycle; namely research, design, development, procurement, production, transportation, marketing, utilization and recovery. The guidelines outline the specific measures we must take for each of these phases and all our employees can refer to them to understand precisely how their work relates to biodiversity and what they need to do to reduce their environmental impact.

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

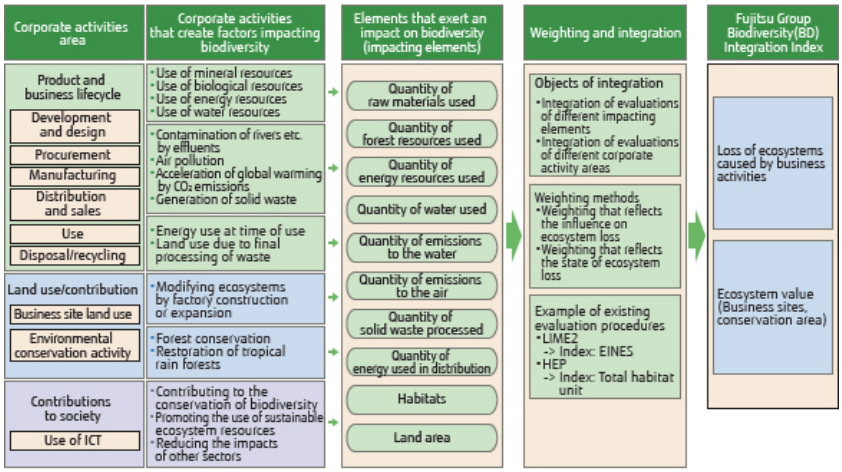
To conserve biodiversity, it is important to evaluate the quantitative impact of business activities on biodiversity and to promote activities that reduce that impact with targets set appropriately.

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 understood 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 land 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 gases 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. This approach can 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. In FY 2011, we achieved a 4.6% reduction compared to FY 2009, mainly through decreases in energy resource usage and waste processing. Going forward, we will strengthen our activities that reduce the impact on biodiversity.

Framework for Quantitative Evaluation Using the Fujitsu Group BD Integration Index



Office Land Use Assessments

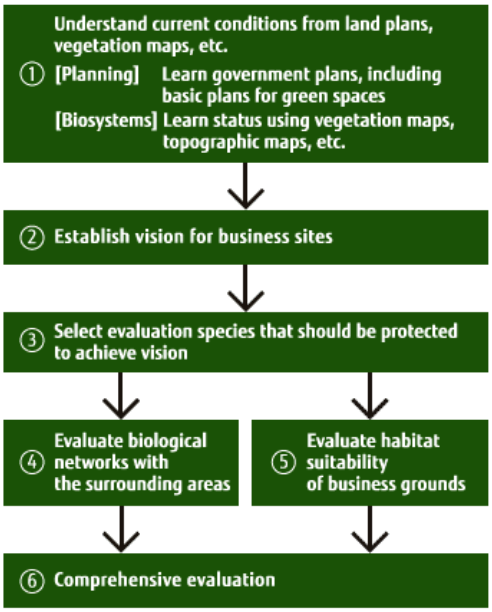
The properties on which Fujitsu offices and plants sit occupy a certain area within their local communities. In building local ecosystem networks, it is thus important that we position these properties as "patches" within these networks, consider how the properties should be maintained, and implement measures for their conservation. To do this, we need to implement a PDCA cycle in which we first conduct a quantitative assessment of the current density of biodiversity on our properties, enact conservation measures based on those assessments, and monitor and evaluate the results.

Fujitsu, in collaboration with Fujitsu FIP Corporation and Professor Akira Tanaka of the Department of Environmental and Information Studies, Tokyo City University, has developed KANTAN HEP, a procedure used to select which regional wildlife should be conserved by designating species of value. Assessments are then performed of those species' habitats in terms of ease of living.

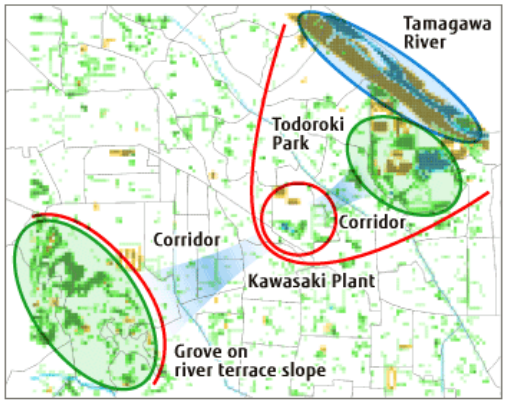
This methodology was applied at Fujitsu's Kawasaki Plant (Nakahara-ku, Kawasaki, Kanagawa Prefecture) and an assessment conducted.

The Kawasaki Plant, which occupies approximately 15 hectares, is located between the Tama River and a forested incline that makes up part of the river's fluvial terrace, and can be considered one area (or "patch") that comprises the ecosystem network of the region. Selected for this assessment as regional wildlife requiring conservation were the great tit (forest), the giant mantis (grassland), and the common kingfisher (waterside). The continuity of the habitat for these three species in the area around the plant was then assessed, and the land within the plant premises was then weighed for its suitability as a habitat by using a Habitat Suitability Index (HSI*1) scorecard to evaluate vegetation, water, activity and rest, and breeding conditions.

Flow of Evaluation



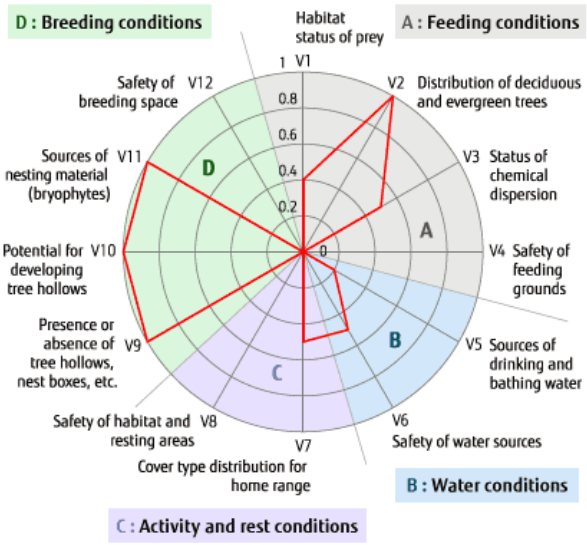
Ecological network centered on Kawasaki Plant



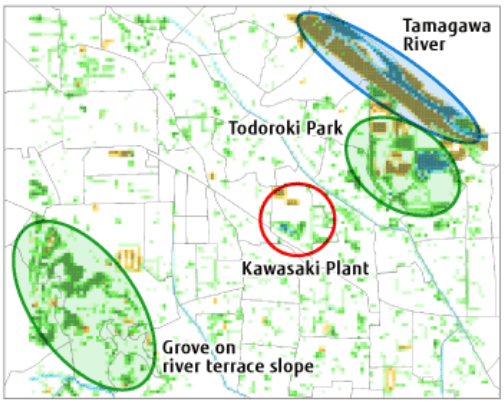
The assessment regarding the great tit, for example, revealed that safety was low in terms of vegetation, water, activity and rest, and breeding space, and the plant is now considering placing certain areas off-limits as a means of conservation. Assessment of the continuity of habitat for the great tit in the area around the Kawasaki Plant showed some continuity with areas along the Tama River and green areas in nearby Todoroki, but it was also learned that no continuity could be found with the river's fluvial terraces and hillside forests.

Application of this methodology is not only useful in efforts to conserve biodiversity on property where offices and plants are located. Through cooperation with governments, local residents, NPOs, and other companies, it can be helpful in considering specific conservation measures needed to build regional ecosystem networks.

Examples of assessment of the great tit in forests



Ongoing assessment in surrounding areas



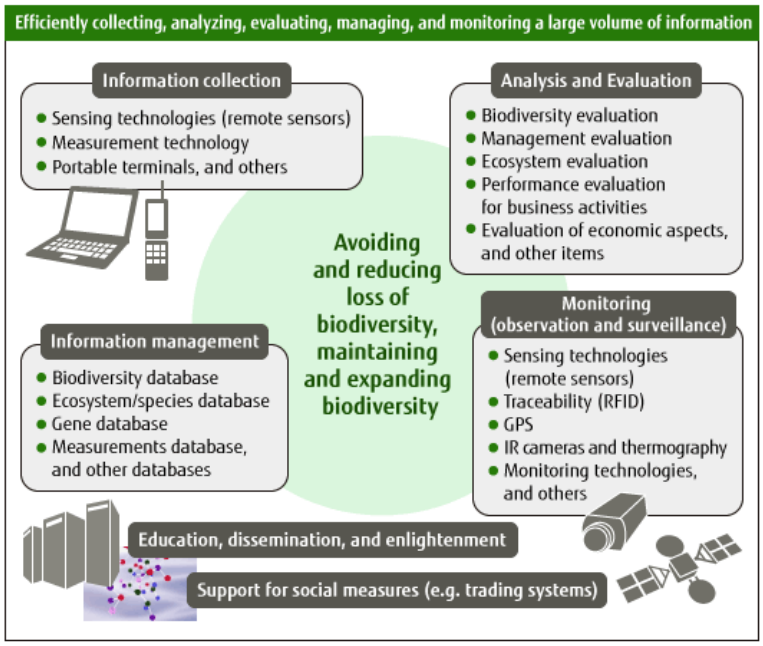
*1 Habitat Suitability Index (HSI) :
An index used to provide a quantitative assessment of wildlife habitats.

ICT and Biodiversity

Contributing to the Conservation of Biodiversity Using ICT

Using ICT to appropriately collect, analyze, assess, and manage complex, wide-reaching information on biodiversity makes it possible to avoid or reduce the loss of biodiversity, and to contribute to its maintenance and expansion.

The Possibility of Conserving Biodiversity through ICT



Examples of the use of ICT in biodiversity conservation include a nationwide survey of dandelions and a survey of vegetation along the Tama River, both using a mobile photo system. A multi-sensing network has also been used to contribute to conservation of the Japanese crane.

An example of the use of ICT in agriculture, one of the provisioning sides of ecosystem services, is the application of a multi-sensing network at Yumekyo Grape Farm Ltd., a winery located in Yamanashi Prefecture.

- Highlight - Biodiversity Conservation That Leverages ICT -

Contributing to Spreading these Efforts Throughout Society

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 Ec- 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.

In FY 2011, 31 Fujitsu Group employees and family members experienced forest planting and forest maintenance at these sites firsthand, and also took study tours of primary forests and mangrove forests.

Maintenance Experience: Tours of Primary Forests

An eco tour in progress

Mangrove Tree Planting in Thailand

Similar to actions in 2010, in April and July of 2011 42 employees of Fujitsu System Business (Thailand) (FSBT), an ICT solution company, planted mangrove saplings in Chonburi Province as part of at marine conservation and ecosystem restoration efforts. Planting of mangroves has become an annual part of FSBT's environmental conservation program, and through these activities, FSBT is working to fulfill its responsibility as one of Thailand's leading green ICT companies.

Planting Mangrove Sapling

Environmental and Social Contribution Activities

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 at our offices, stores, and plants throughout Japan, as well as at our overseas sites. We also participate in everyday social contribution activities, such as collecting used plastic bottle caps, stamps and prepaid cards.

Case Study

Neighborhood Cleanup Activities (Tatebayashi System Center)

Each year as part of its Environment Month events, labor and management at Tatebayashi System Center jointly hold a cleanup of the area around their facility. In FY 2011, a total of 189 employees participated in picking up trash along nearby roads and neighboring parks, weeding roadside plantings, and other activities.

Case Study

Oita Cleanup and Campaign to Recycle Fallen Leaves, and Solar Eco-Lantern Project (Oita Systems Laboratory)

On January 26, 2012, a total of 25 employees participated as the Oita Systems Laboratory held a cleanup day and a class on making eco-friendly solar lanterns, as part of its contribution to the local community.

First, at lunchtime they cleaned up the riverside park, streets, and roadside plantings in the area around the laboratory, picking up fallen leaves and making mulch. After work, they held a class on making eco-friendly solar lanterns, some of which they donated to Oita Prefecture in order to help protect the himeyuri, a variety of lily that has been designated a Class I endangered species in the prefecture.

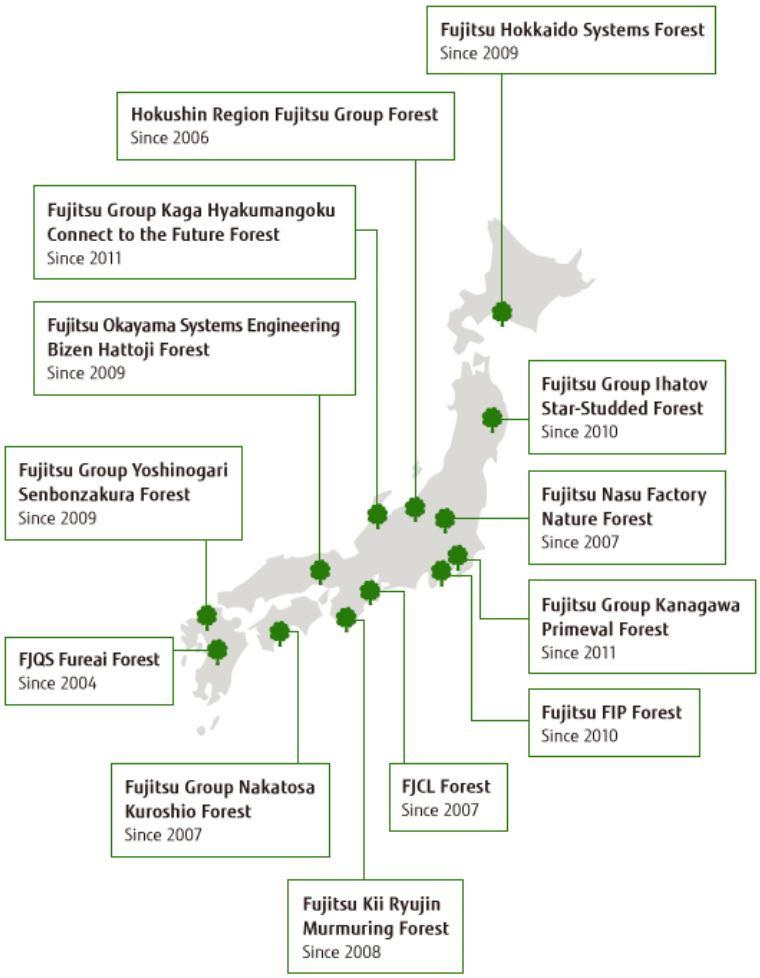
Nature Conservation

The Fujitsu Group is working on forest conservation, urban woodland preservation, seashore cleanup and similar activities to promote the maintenance and recovery of biodiversity and to defend nearby natural environments.

Forest Conservation Activities

The Fujitsu Group carries out forest conservation activities throughout Japan. Among these, 13 locations participate in the "Corporate Forest" program promoted by local governments and implement forest conservation activities as "Fujitsu Group Forest." We also engage in planting activities around the world that help to conserve biodiversity.

Fujitsu Group Forest



Case Study

Clearing Underbrush in the FJQS Fureai Forest

As part of its contribution to the local Kyushu community, in 2004 Fujitsu Kyushu Systems (FJQS) established a 10-year plan to work with Aso Green Stock, a public-interest foundation, to plant, maintain, and preserve forest land. By 2008, the FJQS Fureai Forest was completed, with 15,000 trees planted across 7.8 hectares. Currently, under a plan running through 2012, the project focuses on clearing underbrush as part of the management and preservation phase.

Clearing Underbrush in the FJQS Fureai Forest

Satoyama Preservation

In Japan today, urban woodlands (or Satoyama) are plagued by a variety of problems, such as abandoned farmland and an increase in invasive species, causing the original Satoyama ecosystem to gradually disappear. The Fujitsu Group undertakes a number of activities aimed at protecting urban woodlands in places like natural parks and greenbelt preservation areas.

Case Study

Shishitsuka Satoyama Preservation Program

The Fujitsu Group, with the cooperation of people from The Society of Nature and History of Shishitsuka, participates in programs to preserve Shishitsuka Satoyama in Tsuchiura City, Ibaraki Prefecture. On July 2, 2011, as part of an effort to revive the Satoyama wetlands, a number of giant pussy willows (salix chaenomeloides) were cut down, since their fallen vegetation can accumulate and cause the wetlands to shrink. Canada Goldenrod, a non-native grass which grows to about the height of a child, was also uprooted, as it is fast-growing and can eventually fill an entire wetland.

Shishitsuka Satoyama Preservation Program

Case Study

Honey Smile Project

In FY 2011, Fujitsu Coworco Ltd. began its Honey Smile Project, aimed at addressing the falling honeybee population by increasing the number of cultured bee colonies while giving due consideration to biodiversity. This project involves growing milkvetch and other flowers which provide important sources of nectar needed by honeybees for pollination, building and placing hives adjacent to the plantings. Through this effort, honeybees carry the pollen back to the hive, while also helping to pollinate the flowers. The fruits and seeds that result become food for small animals, and their droppings then provide nutrition for a wide variety of plants and animals, creating a cycle of life that repeats and forms an ecosystem. Our abundant lives are made possible by the bounty of nature, and as part of its role as a corporate citizen, Fujitsu will continue to contribute to society through these kinds of activities.

Fujitsu Coworco Ltd. Honey Smile Project

Case Study

Volunteer Efforts to Learn About Regional Environmental Issues

In March 2012, the Sydney office of Fujitsu Australia and New Zealand (FANZ) participated in a volunteer environmental project on Goat Island, near the center of Sydney. Landcare Australia, an NPO, called for participation in this environmental preservation program, which aimed to return Goat Island to its pre-exploration state by restoring the natural landscape and repairing facilities on the island. Participation in the project has led to a greater awareness of environmental issues among FANZ employees. One commented, "I learned a lot about the environmental problems that threaten our world today," while another noted that "By participating in this program in our own community, I learned about the local environment, and it was a great opportunity to deepen my understanding."

Environmental Education and Enlightenment Training Outside the Fujitsu Group

Environmental Education for the Next Generation

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 2011, we gave lessons at 49 locations, including elementary schools, junior and senior high schools, and community centers, for 3,143 people. Lessons touched on topics such as the "PC 3R" exercise (in which students learn about 3R while dismantling a PC), the My Earth card game (in which students study global environmental problems), and how electricity is produced and ways to measure when it is being wasted.

Also, to respond to the demand for more of these lessons, we held an instructor development course in FY 2011 in which a further 3 Fujitsu Group employees learned how to deliver the lessons in the Kansai area. As of April 2012, 85 instructors are providing these environmental lessons at locations throughout Japan.

On-Site Environmental Classes in FY 2011

Class Theme	Classes Given	Participants
PC 3R exercise (learning about 3R while dismantling a PC)	41	2,684
My Earth (card game that teaches about global environmental problems)	6	261
How electricity is produced and how to measure when it is wasted	2	198
Total	49	3,143

Tadonaka Elementary School in Kuwana City, Mie Prefecture (PC recycling)

Ochiai Junior High School in Shinjuku-ku, Tokyo (PC dismantling)

Hachioji Miyakami Elementary School in Hachioji City, Tokyo (My Earth)

Kawasaki Science Challenge in Kawasaki City, Kanagawa Prefecture

Case Study

Environmental Summer School (Fujitsu Kasei Limited)

Fujitsu Kasei holds an environmental summer school program focused on the theme of learning the secrets of recycling by disassembling computers.

The aim of the program is to deepen the students' understanding of environmental issues as they disassemble personal computers, and to provide an opportunity for them to think about, and act on, things they can do in their everyday lives to benefit the environment. Since FY 2010, the program has been held for students in elementary school grades four through six in Sagamihara, Kanagawa Prefecture. The program held on August 11, 2011, saw 26 local children participate.

TOPICS

Fujitsu Receives Certificate of Appreciation from the Forestry Agency for its "Birdie for Green" Project in Support of Reforestation and Recovery from the Great East Japan Earthquake

The "Birdie for Green"*1 program is a reforestation and biodiversity preservation effort promoted through the Fujitsu Ladies golf tournament, part of the Ladies Professional Golf tour.

As part of efforts to support the recovery of regions affected by the Great East Japan Earthquake, the 2011 Fujitsu Ladies golf tournament made a donation to the Great East Japan Earthquake Recovery and Reforestation project of the National Land Afforestation Promotion Organization, a public interest corporation. Fujitsu was presented with a certificate of appreciation from the Director General of the Forestry Agency in recognition of this donation.

At the presentation ceremony, Yoshitsugu Minakawa, Director General of the Forestry Agency, presented the certificate of appreciation to Fujitsu Senior Executive Vice President Masami Fujita, and encouraged further efforts, noting that he expects much of Fujitsu through its reforestation-based environmental preservation activities.

Photo commemorating the certificate

Photo of the certificate

*1 Birdie for Green :
An environmental preservation initiative of the Fujitsu Ladies golf tournament, in which the number of saplings to be donated is calculated based on player performance, with an equivalent amount of money donated for forest restoration and conservation of biodiversity. In 2009 and 2010, reforestation and maintenance work was done in the Fujitsu Ladies' Forest, located on the island of Borneo in Malaysia.

Environmental Management

We are continuously working to improve our ISO 14001*1-based environmental management systems and to promote group-wide environmental management

*1 ISO:
Environmental Management Systems (EMS) standard determined by the International Organization for Standardization (ISO). Certification is granted to environmentally aware organizations that develop systems for ongoing reductions in their environmental footprint.

Fujitsu Group's Environmental Management Systems

Fujitsu has constructed environmental management systems (EMS) based on the ISO 14001 international standard and is promoting environmental improvement activities across the Group. After acquiring ISO 14001 certification for Japanese consolidated subsidiaries at the end of FY 2004, we expanded this effort to include overseas subsidiaries and acquired global integrated certification in FY 2005.

By constructing EMS along with a global supply chain, Fujitsu has further strengthened its global governance. This also allows Fujitsu to promote even more efficient and highly effective environmental activities; not only grasping our achievement status for 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, environmental communication and preservation activities, and conducting management reviews.

EMS Implementation and Operational Status

As of the end of FY 2011, Fujitsu has 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.

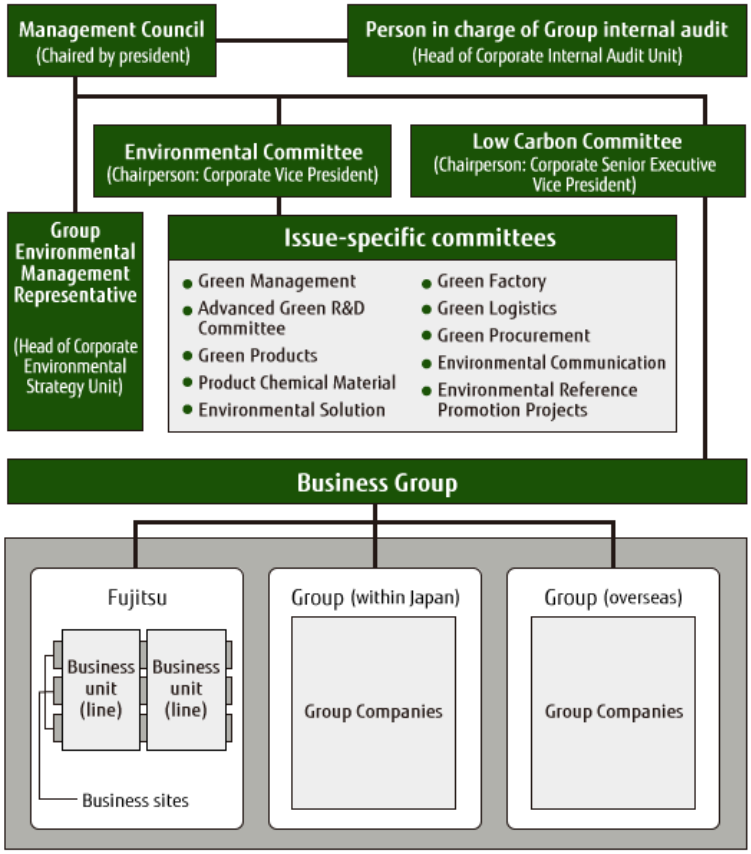
Environmental Promotion Structure

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, and other areas. The other 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 Advanced 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 advanced technologies that will boost the efficiency of ICT products and improve the environmental load reduction effects of solutions.

The Environmental Committee's deliberations are also 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

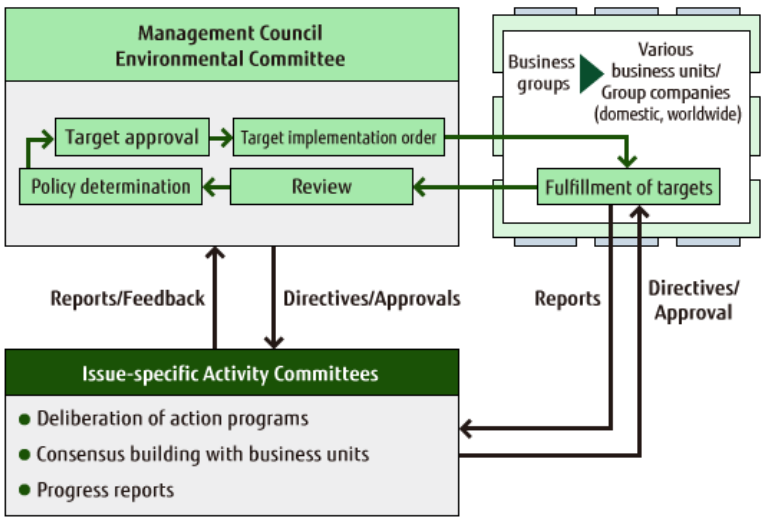


Activity Flow

The Environmental Committee is the highest body for proposing, deliberating, and deciding upon environmental matters relating to all Group companies. The committee's main duties are to discuss the Fujitsu Group's environmental policies and the environmental objectives of all Group companies, and check on the status and results of environmental management activities, making corrections if necessary.

The issue-specific committees are subcommittees set up by the Environmental Committee to make a dedicated response to specific issues. Their main role is to discuss targets for the Environmental Protection Program, check on the progress being made for each target and promote further activity toward achieving them. Issue-specific committees' progress reports are approved and directed by the Environmental Committee.

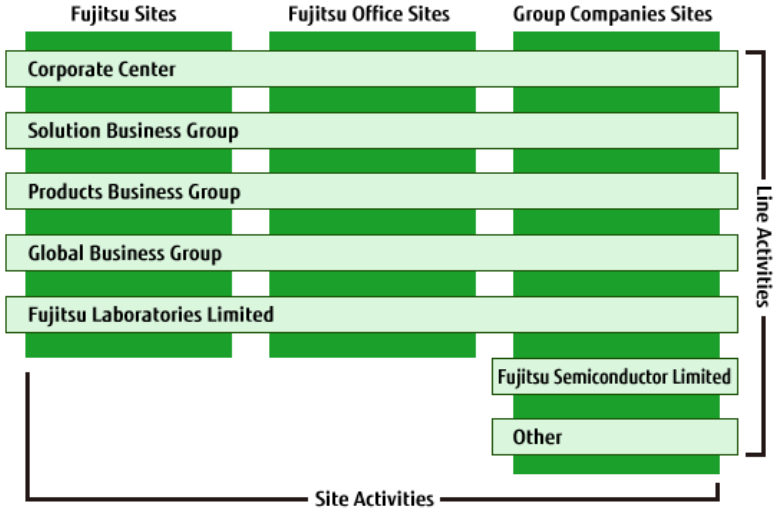
Action Implementation Flow



Management Based on the Line/Site Matrix Structure

The Fujitsu Group carries out its environmental management along the same framework lines as its corporate management. To this end, we are pursuing environmental management within a matrix structure combining (1) "line activities" directly tied to the business operations of various divisions and companies (including Super Green Product development and the development and sales expansion of Environmentally Conscious Solutions) and (2) "site activities" to tackle common themes affecting each factory or business location (such as energy conservation and waste reduction).

In this way, along with minimizing the environmental burden of our own business activities, we promote reductions in environmental burdens more generally through the sale of our products and services.



Case Study

Banksia Environmental Award Won by Fujitsu Australia and New Zealand

In November 2011, Fujitsu Australia and New Zealand (FANZ), a leading provider of green ICT solutions in Australia, won the "Banksia Environmental Award for Leading in Sustainability - Setting the Standard for Large Organizations" award, widely considered Australia's most prestigious environmental award. In bestowing this honor, the Banksia Environmental Foundation has acknowledged FANZ's contribution to sustainability over the years. Established as an NPO in 1989, the foundation promotes awareness of the importance of the environment and sustainability through its awards and related activities. The award judges commented that: "This was an extremely impressive entry, with compelling evidence that supports the integration of sustainability principles into the corporate culture. The breadth and scale of the FANZ program is comprehensive with results being reflected both internally and externally. FANZ has strong environmental credentials with the potential to influence significant energy and greenhouse gas reduction with customers."

Continuous Improvements to Environmental Management Systems

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 Fujitsu to consolidate a wide variety of information such as plans, 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. We also utilize a Web-based conferencing system, a global communications platform being promoted throughout Fujitsu, for remote communication in EMS operations.

Efforts to Improve Environmental Performance

Fujitsu has been working on creating a system to evaluate the status of target achievement, compliance and operating management to improve environmental performance at factories.

We continuously make efforts to strengthen environmental governance by promoting the Fujitsu Group 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 2011, we carried out internal audits for factories, offices, and other facilities at 449 locations both in Japan and overseas from June to December 2011. For this audit, we scrutinized the trends and results with the FY 2010 internal audit and the external audit and found four major points to be focused on: (1) adherence to compliance, (2) the status of efforts for the Fujitsu Group Environmental Protection Program (Stage VI), (3) the setting of environmental targets linked to our core business, and (4) human resources development plans and implementation status. Also, we continuously implement mutual audits between different sites and 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 347 indicated matters, of which none were classified as major, 25 as minor, and 322 were observations.

The number of indicated matters decreased by 62 from the previous year. In terms of content, 55% involved adherence to compliance, operational control, and environmental objectives and targets. The matters concerning compliance with various laws involved industrial waste. Matters related to operational control involved failure to fully implement, or a lack of in some cases, voluntary rules. Matters related to environmental objectives and targets involved inconsistencies with upper-level policy.

External Audit and Results

In FY 2011 an external audit was carried out from September 2011 through January 2012. In Japan, we were audited by the Japan Audit and Certification Organization for Environment and Quality (JACO). JACO identified no matters for the Fujitsu Group as a whole. In addition, JACO made 77 observations for individual Group companies. Outside Japan, we were audited by DNV BUSINESS ASSURANCE JAPAN K.K. DNV also identified no matters for the Fujitsu Group as a whole, but they identified 16 minor matters and 41 observations. We have completed remedying these matters as of the end of FY 2011. Audit findings were shared throughout the Group, and we are confirming the status of these matters in the FY 2012 internal audit. ISO 14001 recertification, conducted every three years, also took place in FY 2011. Recertification was granted in March 2012.

Fujitsu started discussions with audit organizations in September 2008 about the introduction of an Environmental Performance Evaluation (ISO 14031) in our internal audit to improve the quality of our environmental activities. In FY 2011, this performance evaluation was applied on a trial basis at 13 production sites, and in FY 2012 will be extended to major manufacturing Group companies in Japan.

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 2011, there were14 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 (1) violations related to solid waste processing manifests or outsourcing contracts, or (2) water quality standard values being exceeded (BOD*2 excess in factory effluents).

Going forward, Fujitsu will strengthen reeducation efforts and its monitoring structure pertaining to solid waste to avoid any possible legal violations. In parallel, we will increase the number of official inspectors. Efforts around water quality will also be standardized, resulting in stricter voluntary targets at more business sites.

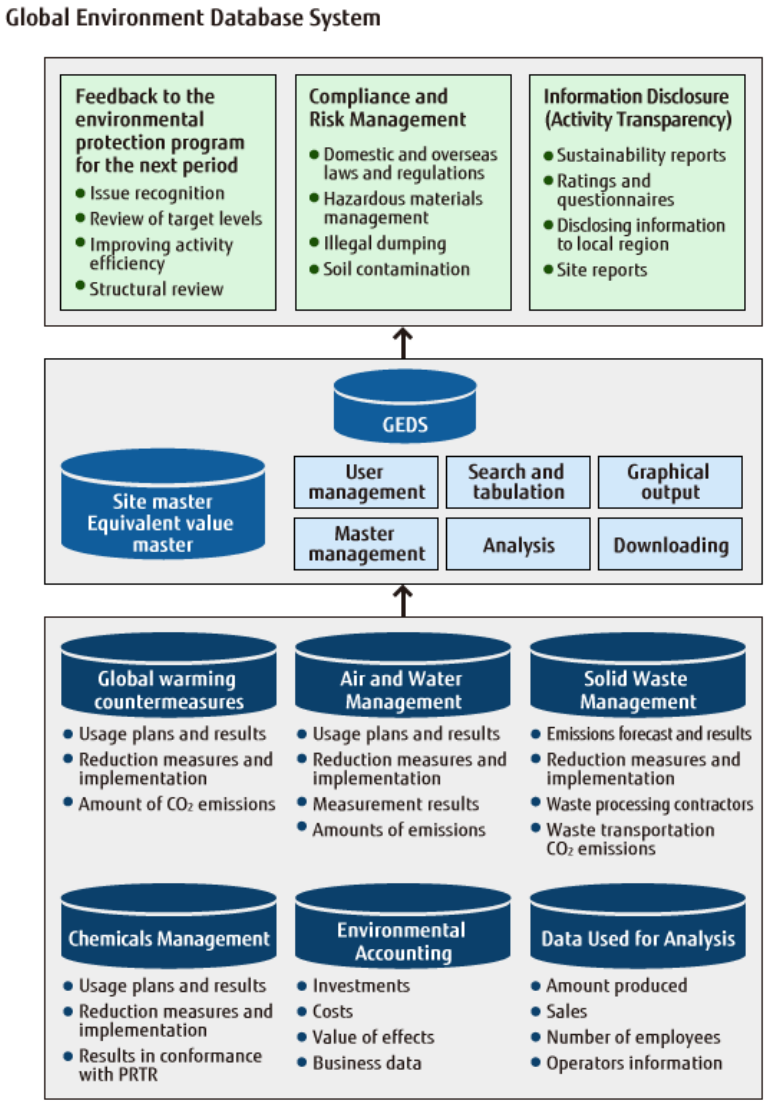
*2 BOD:
Biochemical oxygen demand.

Environmental Management Information Systems

To improve the efficiency and visibility of environmental management, the Fujitsu Group makes aggressive use of unique environmental management tools that take full advantage if ICT.

Use of the Global Environment Database System

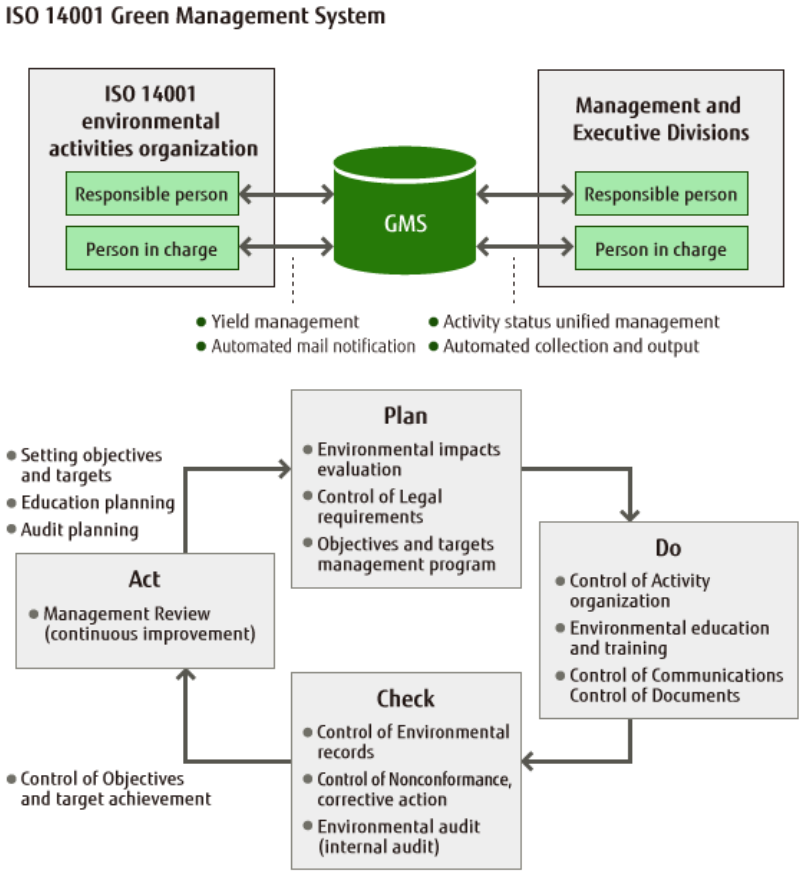
The Fujitsu Group uses the Global Environment Database System (GEDS) to collect the environmental burden (performance) information for the Fujitsu Group companies and business sites worldwide and to manage plans, results, and policy information uniformly.



Use of the ISO 14001 Green Management System

The ISO 14001 Green Management System (GMS) is used to exercise unified control over the operational status of the EMS, and to monitor the situation involving improvements to, and legal compliance with, nonconformance issues notified at environmental audits; communications activities; direct and indirect effects and risk/countermeasure levels identified in environmental impact assessments; the setting of environmental management goals and objectives; and the implementation of the environmental management program itself.

This enables corrective measures and objectives to be soundly managed, and effectively ensures continual improvement of the activities with reduced risks.



In-House Educational and Enlightenment Activities

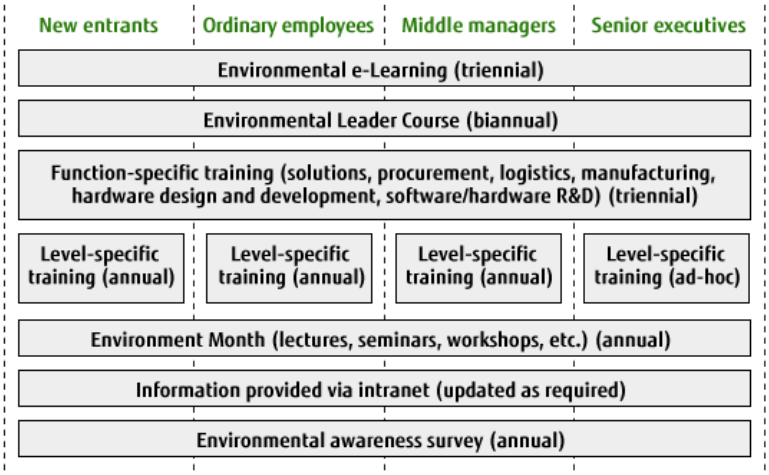
The Fujitsu Group is implementing a wide range of environmental education and enlightenment efforts for employees in all divisions.

Our Environmental Education System

To ensure that our environmental activities take firm root through the participation of all employees, 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. Based on this belief, 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 employees at each level, including 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), software development, procurement, logistics, manufacturing, hardware design and development, and hardware and software R&D. 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



Environmental e-Learning for All Group Employees

At the same time as promoting proactive efforts for environmental protection activities by every one of our employees in our main business, in 2010 we also implemented an environmental e-Learning program for all Group employees to support the implementation of environmental protection activities that conform to the ISO 14001 international standard as well as informing of, making understood, and implementing the Fujitsu Group Environmental Protection Program (Stage VI).

Environmental e-Learning program screenshot

The Basic Course, in which all Group employees participate, is available in 11 languages. Through it, employees learn about the Fujitsu Group Biodiversity Action Principles and the Group's efforts in the area of biodiversity conservation. In addition to the Basic Course, we have also implemented six other function-specific courses to encourage employees to engage in environmental actions appropriate to their duties as well as biodiversity conservation activities based on the Fujitsu Group Biodiversity Guidelines.

Note that by implementing this education in an e-Learning format, we calculate that this will also have the effect of reducing CO2 emissions by about 6,500 tons compared to earlier concentrated education formats.

Overview of Environmental e-Learning

1. Objective

- Publicizing, understanding, and practicing the Fujitsu Group Environmental Protection Program (Stage VI)
- Encouraging every employee to make proactive efforts toward environmental protection in the course of their own work

2. Targets and Content

The program is composed of the Basic Course, in which all employees worldwide participate, and six function-specific courses. Tests are implemented after the courses to determine how well employees have understood the material, and courses are completed by earning a certain number of points on that test.

Target participants for the Basic Course: All employees and executives of Fujitsu Group at home and abroad

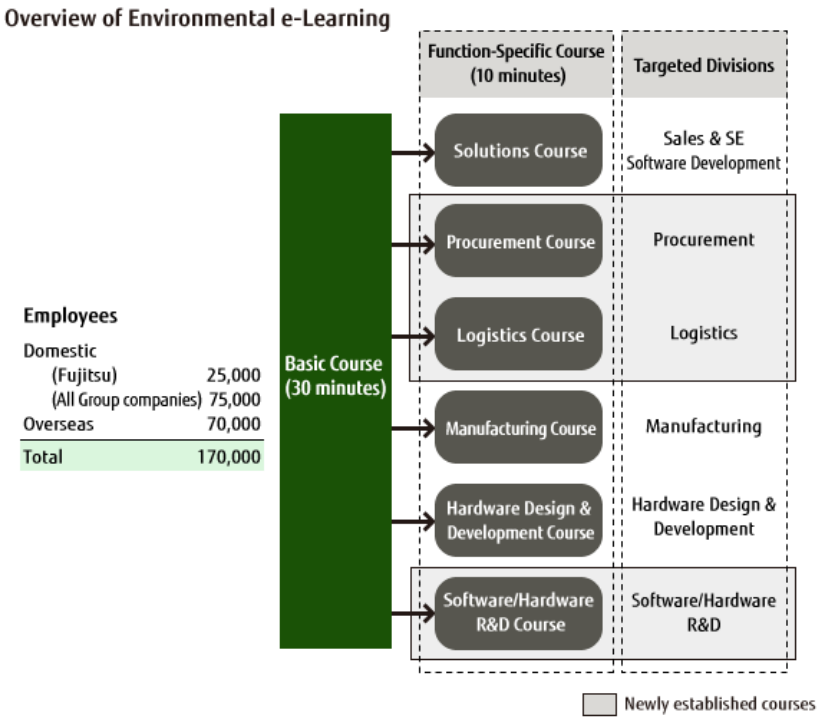
The course covers the relationship between our daily lives and global environmental issues, what each of us can do at work or in our day-to-day lives, trends in global environmental issues and the Fujitsu Group's efforts to address environmental issues including the Fujitsu Group Environmental Protection Program (Stage VI) and other activities, and contributions to building a society in which conserving biodiversity becomes a reality.

Target participants for the function-specific courses: All employees and executives of the Fujitsu Group in Japan

1. Solutions Course: Domestic sales and SE divisions, software development divisions
   Looks at providing green ICT that contributes to our customers and society, green solutions, promoting recycling of ICT products, etc.
2. Procurement Course: Domestic procurement divisions
   Reduction of CO2 emissions in cooperation with suppliers, biodiversity conservation activities, etc.
3. Logistics Course: Domestic logistics divisions
   Reduction of CO2 emissions in the distribution and transport process, lessening of the impact of distribution and transport on biodiversity, etc.
4. Manufacturing Course: Domestic manufacturing divisions
   Approaches and points to focus on in lessening the environmental impact of manufacturing plants (greenhouse gases, chemical substances, waste materials) and in working to lessen their burden on the environment
5. Hardware Design and Development Course: Domestic design and development divisions
   Contributing to customers through environmentally friendly product design, lessening the impact of design and development on biodiversity, etc.
6. Software/Hardware R&D Course: Domestic software/hardware R&D divisions
   Introducing an environmental perspective to the R&D process

3. Schedule / Method of Implementation

- June to December, 2010
- Using the Fujitsu Group's common learning platform "Fujitsu NetCampus," the program was rolled out successively across each company. Progress and results are managed using Fujitsu's "Internet Navigware."



Environmental Education for Engineers

The Fujitsu Group carries out a range of environmentally related education, such as equipment-dismantling training for engineers and tours of recycling centers for members of the Sales Division

Promoting Awareness Through Environment Month

The Fujitsu Group holds a number of events to raise environmental awareness among our employees in conjunction with Environment Month (June), which is sponsored by Japan's Ministry of the Environment.

Development of Environmental Learning Materials

In order to share with the outside world the environmental education expertise it has developed for its employees, Fujitsu has teamed up with Fujitsu FOM Limited to create a set of learning materials for environmental education entitled "Global Environmental Issue Keywords," and has been marketing them since May 2008 in the form of books and e-learning materials.

The program incorporates a broad spectrum of issues, including basic knowledge of global environmental issues, the environmental business of other companies, and ICT's contribution to the environment, all from the viewpoint of providing a broad understanding not only to those involved in environment-related businesses, but to all employees in the Fujitsu Group.

Global Environmental Issue Keywords book and e-Learning screenshot display

In-House Award Scheme

Fujitsu presents awards recognizing outstanding Group environmental preservation efforts.

Environmental Contribution Award and Environment Contest

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

Environmental Contest 1st prize - Fujitsu Sponsors a Play Pump

In FY 2011, The top Environmental Contribution Awards were for the introduction of a system for utilizing geothermal heat at the Nagano Plant, an initiative promoting biodiversity conservation through use of multi-sensing networks, and an energy-saving initiative. In the Environmental Contest, the top award went to the project noted below, with awards also going to another 25 proposals selected from among those submitted by Group companies around the world.

Special Environmental Award

Since FY 2008, the Fujitsu Group has offered a Special Environment Award program, intended to encourage Group sales and SE teams to promote the use of ICT solutions in helping customers reduce their environmental load.

The program originally focused on visualizing the effects of CO2 reduction through introduction of ICT, and enhancing the solutions business through pursuit of such opportunities. In FY 2011, a new evaluation item was added to assess the ability to achieve customer cost reductions through energy conservation (reductions in electricity consumption). Organizations notable for their activities in these areas were recognized by Fujitsu's president at the Company's April 2012 Solutions Business Expansion Conference.

Awards ceremony

Commemorative photo

Environmental Communication

The Fujitsu Group is committed to bidirectional communication with all stakeholders and pursues a variety of different opportunities to this end.

Information Disclosure via Sustainability Reports and the Fujitsu Website

In 1996, the Fujitsu Group began publishing an Environmental Report, focusing on the records and results of environmental protection activities carried out by the Group. The report reflects Fujitsu's commitment to making such information publicly available, thereby increasing the transparency of the Group's activities. In 2003, social aspects were combined with the Environmental Report for the publication since then of the Fujitsu Group Sustainability Report. The 2011 Fujitsu Group Sustainability Report was awarded the Prize for Excellence in Environmental Reporting as part of the 15th Environmental Communication Awards, sponsored by Japan's Ministry of the Environment and the Global Environmental Forum. The report was recognized for its excellence in disclosing information relating to Fujitsu Group's environmental management strategy and initiatives, as well as its efforts for environmental protection and sustainability. The Environment page of the Fujitsu website, meanwhile, contains the contents of the Sustainability Report, as well as specific details of individual initiatives, and is frequently updated with the latest information.

Site Report Publication

Fujitsu production plants, business sites and Group companies publish environmental reports in an effort to further understanding of their environmental initiatives among local residents and customers.

Events & Seminars

Main Conventions in which Fujitsu Participated in FY 2011

Convention	Location	Date
Japan		
Kumagaya Eco-Life Fair 2011	Kumagaya	May 2011
Interop Tokyo 2011	Chiba	June 2011
The Best 100 Surprising Ecological Items of 2011	Kyoto and Tokyo	August 2011
Tokyo International Conference for Sustainable Future	Tokyo	September 2011
CEATEC JAPAN 2011	Chiba	October 2011
Fujitsu Ladies 2011	Chiba	October 2011
Carbon Offset Matching in Kochi	Kochi	October 2011
Aomori ICT Cloud Festa	Aomori	October 2011
Eco-Life Yamagata	Yamagata	October 2011
Ishikawa Dream Future Expo	Kanazawa	October 2011
The Children's University of Kawagoe, Special Lecture	Kawagoe	November 2011
Eco Products 2011	Tokyo	December 2011
Kawasaki International Eco-Tech Fair 2012	Kanagawa	February 2012
Carbon Market EXPO 2012	Tokyo	March 2012
Overseas		
Japan - China Green Expo 2011	China	June 2011
Green ICT Global Business Promotion 2011	Thailand	August 2011
International Greentech & Eco Products Exhibition & Conference Malaysia 2011	Malaysia	September 2011
ITU TELECOM WORLD 2011	Switzerland	October 2011

Eco-Products 2011 (Tokyo)


Kawasaki International Eco-Tech Fair 2012 (Kawasaki)

Environmental Efforts at Events and Seminars

At the Fujitsu Forum, annual meeting of shareholders and other seminars and events, Fujitsu actively utilizes green electricity as a carbon offset for its electricity usage. Other environmental efforts at such venues include reducing the amount of paper used and utilizing eco-friendly materials.

In FY 2011, Fujitsu purchased a Green Power Certificate for a total of approximately 26,000kWh of electricity.

Environmental Efforts in Catalog Printing

When printing catalogs, Fujitsu utilizes environmentally friendly materials, including certified eco-friendly paper and ink, and ecologically sound printing methods. These efforts help reduce CO2 emissions as well as harmful liquid waste and other printing byproducts.

Communicating with Stakeholders

The Fujitsu Group works to establish proactive communications, as a way of growing together with its stakeholders.

Environmental Dialogues with Stakeholders

Fujitsu conducts environmental dialogues as a means of informing a broad range of stakeholders about Fujitsu Group's environmental activities, improving those activities through mutual dialogue, and building a trusting, cooperative relationship with society.

Dialogues Held in 2012

1st Dialogue : held on March 21, 2012

[Participants]

- Atsuko Suzuki
  Representative Director, Environmental Business Agency
- Hiroki Hondo
  Professor, Graduate School of Environment and Information Sciences, Yokohama National University
- Yumiko Kawamura
  Senior Corporate Officer, Fundraising &Marketing Division, WWF Japan
- Junko Edahiro (Facilitator)
  President, Institute for Studies in Happiness, Economy, and Society

[Opinions]

Atsuko Suzuki

- I think the use of ICT to support activities involving the public are an important initiative. An example is the survey of dandelion distribution using mobile phones.
- My idea of an environmentally progressive company is one that links environmental activities directly with the strengths of its main business. Fujitsu should pursue environmental management that emphasizes the unique aspects of the company.

Hiroki Hondo

- Fujitsu has obviously worked steadily on its activities and has developed a solid framework for them. I think, however, that the company should communicate more about the reasons for its involvement in these activities.
- The Sustainability Report would make more impact on readers if it focused on the key points that Fujitsu really wants to communicate, rather than on simply including every activity.

Yumiko Kawamura

- I am satisfied that Fujitsu is responding sufficiently to environmental concerns, but I think the company could make a greater impact by developing symbolic activities.
- From a communication perspective, it is important to set a clear target and consider what is to be communicated and to whom.

2nd Dialogue: held on April 17, 2012

[Participants]

- Miyako Maekita
  Representative of Sustena
- Yasunari Matsuno
  Associate Professor, Department of Materials Engineering, Graduate school of Engineering,The University of Tokyo
- Kana Yamashita
  Deputy Director, Director, Climate Security Program, Conservation International Japan
- Junko Edahiro (Facilitator)
  President, Institute for Studies in Happiness, Economy, and Society

[Opinions]

Miyako Maekita

- While I believe Fujitsu to be a leader in its environmental activities, the issue remains that its efforts have yet to be apparent in society at large.
- Perhaps you could arrive at more creative initiatives by incorporating the needs of the average consumer in your research.

Yasunari Matsuno

- A company's environmental activities will be short-lived if seen only in terms of their societal benefits. I think Fujitsu's greatest strength lies in its ability to contribute to the environment through its core solutions business.
- Smart grids are one potent solution to global warming and energy issues, and an area I would like to see Fujitsu pursue further.

Kana Yamashita

- I think Fujitsu's efforts to involve even its suppliers in its biodiversity activities represent a progressive initiative.
- That said, I also think Fujitsu is lacking in alliances with NGOs and in building a global viewpoint. There is a need among emerging nations for use of ICT in forest conservation, ecosystem surveys, and agricultural support.

3rd Dialogue: held on June 28, 2012

[Participants]

- Toshihiko Goto
  Chair, Environmental Accounting Research Group
- Seita Emori
  Chief, Climate Risk Assessment Section, Center for Global Environmental Research, National Institute for Environmental Studies
- Rie Asaba
  Chairman of the Board of Directors, NPO Kawaguchi Citizens Environmental Council
- Junko Edahiro (Facilitator)
  President, Institute for Studies in Happiness, Economy, and Society

[Opinions]

Toshihiko Goto

- Fujitsu's efforts in terms of traditional environmental efforts focusing on the company itself are, I think, nearly perfect.
- What society is looking for going forward, however, are efforts that involve the entire value chain. To ensure the company's own environmental management efforts move ahead smoothly, Fujitsu will need to look at the extent to which it can grasp the issues and come up with measures in response.

Seita Emori

- Considered in the long term, I think the Green by ICT initiative holds great potential to transform the systems of society through greater efficiency.
- Fujitsu needs to deliver a message based on a broader perspective, one that addresses how it hopes to change society, and what kind of company it wishes to be.

Rie Asaba

- I now understand how ICT is involved in many aspects of daily life, and how it also ties into benefiting the environment.
- I'd like to see Fujitsu use its delivery of on-site environmental classes to convey how ICT contributes to the environment. By not only simply describing environmental issues, but enabling employees to explain in their own words how the company contributes, Fujitsu can make it easier for children to imagine how they might contribute to the environment in the future.

We will continue to hold these dialogues going forward, putting these views to use in improving our activities. We are also working to deepen our understanding of the social issues involved, and will look at expanding into more specific collaborative efforts.

Cooperation with External Organizations

The Fujitsu Group works to reinforce environmental management through participation in external organizations.

Collaborating with External Groups to Promote Green ICT

The Fujitsu Group is committed to reducing environmental impact on a global scale by promoting widespread use of Green ICT through proactive initiatives with external organizations, including international standardization bodies.

For example, methods for measuring positive environmental impact produced by Fujitsu Group solutions had not been standardized internationally. So Fujitsu took part in the ITC and Climate Change Group (SG5 WP3) of the International Telecommunication Union Telecommunication Standardization Sector (ITU-T), an international standardization body in the electrical and electronics sector. The group's findings were published in March 2012 as the "Methodology for the Assessment of the Environmental Impact of Information and Communication Technology Goods, Networks and Services (L.1410)."*1 At the national and regional level as well, we serve as chair of the Green IT Promotion Council's Committee of Survey and Analysis in Japan and joint chair of the ICT for Energy Efficiency (ICT4EE) Forum's Working Group 2 in Europe, contributing to the development of more practical methods for assessing environmental impact. These initiatives have made it possible for CO2 reductions produced by ICT to be assessed under an international framework, which is expected to promote further utilization of the technologies.

Further, the Fujitsu Group joins in activities to evaluate the sustainability of our products using internationally recognized methods. For example, the IEC TC 111 committee creates environmental standards for electrical and electronics products, and we are actively involved in the Japanese committee of its Working Group 4, which drafts international standards for calculating greenhouse gas emissions. In addition, for the IEC TC 100 committee, which is responsible for international standards for audio, video and multimedia systems and equipment, Fujitsu serves as technical secretary for TA 13, which is in charge of environmental regulations, and chair of the Japanese committee.

*1:
Ministry of Internal Affairs and Communications of Japan press release (in Japanese)

External Organizations

Green ICT

Promoting and diffusing Green ICT and standardization activities

- Green IT Promotion Council
- ICT4EE

Climate Change

Carrying out proposals to achieve a sustainable low carbon society

- Japan Climate Leaders' Partnership (Japan-CLP)
- ITU and Climate Change, the climate change group of the International Telecommunication Union Telecommunication Standardization Sector (ITU-T)
- International Electrotechnical Commission (IEC)
- Greenhouse Gas Protocol (GHG Protocol)

Biodiversity

Promoting the conservation of biodiversity by corporations

- Business and Biodiversity Initiative
- Japan Business Initiative for Conservation and Sustainable Use of Biodiversity (JBIB)

Product Chemicals and Eco Design

Investigating frameworks to effectively communicate information on chemical substances contained

- The Japan Article Management Promotion Committee (JAMP)
- The Japan Green Procurement Survey Standardization Initiative (JGPSSI)
- Japan Environmental Management Association for Industry (JEMAI)

Environmental and Social Contribution

Promote environmental and social contribution activities

- WWF (World Wide Fund for Nature) Japan
- Nature Conservation Society of Japan (NACS-J)
- Wild Bird Society of Japan
- Japan International Forestry Promotion and Cooperation Center (JIFPRO)

Environmental Communication

Promote environmental communication

- Nippon Environment Club
- Japan for Sustainability (JFS)

Environmental Activities

- Communications and Information Network Association of Japan
- Japan Electronics and Information Technology Industries Association (JEITA)
- KEIDANREN (Japan Business Federation)

etc.

Participation in Environmental Campaigns

Through participation in environmental campaigns, each employee works to protect the environment starting with their everyday spaces and activities.

Participation in the Challenge 25 Campaign

The Fujitsu Group in Japan participates in the Challenge 25 Campaign, which is a nation-wide movement to mitigate global warming-a goal each of our employees supports fully by making efforts to conserve energy at work and in the home.

The 6 Challenges

The Challenge 25 Campaign proposes "6 Challenges." These constitute specific steps toward reducing CO2 emissions and can be performed by anyone in the home or office, etc.

- Challenge 1: Choose an environmentally friendly Lifestyle
- Challenge 2: Choose energy-saving products
- Challenge 3: Choose natural energies
- Challenge 4: Choose environmentally friendly buildings and houses
- Challenge 5: Support activities and products that lead to the reduction of CO2 emissions
- Challenge 6: Participate in community activities to prevent global warming

At the Fujitsu Group, we are proactively working to meet these 6 Challenges.

Air Conditioner Settings

Air conditioners are set to certain temperatures year-round. 28°C in cold weather and 20°C in hot weather.

In the summer, we implement "Cool Biz" dress-code practices and ask that our customers and partners also dress lightly when visiting us. In fiscal 2011, with the implementation of power-conservation measures following the Great East Japan Earthquake, the Fujitsu Group took it one step further, introducing a "Super Cool Biz" casual business dress code between May and October.

Power Conservation Lights-Down Campaign in 2011

Each year, the Fujitsu Group participates in the "CO2 Reduction / Lights-Down Campaign," a global-warming prevention effort launched by Japan's Ministry of the Environment in 2003. This campaign calls for people to turn off lights at landmark facilities and in the home.

In fiscal 2011, lights were turned off on two special days-the day of the summer solstice on June 22 and the Tanabata Festival on July 7, which is also Cool Earth Day. In addition, given the need to conserve energy after the Great East Japan Earthquake, a call went out to turn lights down throughout the day and at night between June 22 and August 31 as part of "Day and Night: Power Conservation Lights-Down 2011."

In support of this objective, on June 22 and July 7, in the two hours between 8 PM and 10 PM, the Fujitsu Group turned off its neon advertising signs and office lighting. Efforts did not end with these two special days, as the Group continued its efforts to curb electricity use by turning off or reducing unnecessary lighting, and implementing other measures to further conserve power.


Fujitsu Integrated Microtechnology

Fujitsu Isotec

Sapporo Systems Laboratory

Green Curtain Project

The Fujitsu Group is working to prevent global warming. As part of that effort, every summer our offices roll out our green curtain project, which works to keep indoor temperatures down by growing plants along exterior walls and windows. In 2011 the green curtain project, which began in 2006, was implemented at 14 Fujitsu Group offices.

The green curtain project involves growing bitter melon, morning glories, gourds, and other vine plants along exterior walls and windows to block the hot sunlight and lower room temperatures by creating shade. Employees can watch the seedlings, which they plant themselves, grow taller each day-a relaxing experience that also teaches them the joys of gardening. Bitter melons are later harvested and distributed to employees free of charge and is also consumed locally in special dishes served at employee cafeterias.

Case Study

Fujitsu Kawasaki Plant

Each year, Fujitsu's Kawasaki Plant work with Kawasaki City and the municipal government of Naka Ward to grow bitter melon as green curtains. This year, 261 employee volunteers carried out the planting and by summer had grown an enormous curtain measuring 4.5m high by 30m wide. 130 of the harvested bitter melons were then distributed to employees free of charge, while more went into some 336 meals served in the employee cafeteria as part of efforts to consume the produce locally.

Activity dates: May 25 to September 30, 2011
Location: Kawasaki City, Kanagawa Prefecture

Fujitsu Kawasaki Plant

Case Study

Fujitsu Akashi Plant

The Akashi Plant began participating in the green curtain project in 2009, so this marks its third year. We have planted a green curtain in the cafeteria, which is used by many employees, in the hopes that it would be relaxing to see indoors while also helping to keep the area cool. The curtain measures 125m^2 and is capable of absorbing 420kg of CO2.

Activity dates: June 1 to September 30, 2011
Location: Interior of the Akashi Plant, Akashi City, Hyogo Prefecture

Fujitsu Akashi Plant

Case Study

Fujitsu Oita Systems Laboratory

At the Oita Systems Laboratory between May and September 2011, we implemented a green tunnel project with help from all of our green supporters in the building.

In fiscal 2011, we planted bitter melon and Japanese morning glories. In addition to conserving power by providing shade and through evapotranspiration, of particular note is the relaxing effect of walking through the tunnel. The huge harvest of bitter melons was given to the employees. The Japanese morning glory seeds we harvested were provided to various regions as part of a "morning glory bank" initiative, and will be used to further expand our green curtain movement.

Activity dates: May 23 to mid-September, 2011
Location: Oita City, Oita Prefecture

Fujitsu Oita Systems Laboratory

List of External Awards and External Evaluations

The Fujitsu Group's various initiatives for developing a sustainable society have been highly appraised by external observers.

(As of June 2012)

Major External Awards and Evaluations Received by the Fujitsu Group and Its Employees

Recognition	Date	Sponsor(s)	Initiative
21st Century Achievement Award, Environmental Category	June 2012	Computerworld	Response to the Great East Japan Earthquak
Social and Environmental Green Evaluation System(SEGES), Superlative Stage	April 2012	Organization for Landscape and Urban Green Infrastructure	Fujitsu Numazu plant's greening activities
15th Environmental Communication Awards Recipient of Prize for Excellence in Environmental Reporting	February 2012	Japan's Ministry of the Environment and Global Environmental Forum	2011 Fujitsu Group Sustainability Report
Kawasaki Environmental Show-Window Award	February 2012	Kawasaki City, Kanagawa Prefecture	Introduction of environmental reference model
Low CO2 Kawasaki Pilot Brand '11	February 2012	Kawasaki City, Kanagawa Prefecture	ESPRIMO D570/B enterprise desktop PC and proximity sensor-equipped VL-178SRL ECO Plus display
2nd Kanagawa Global Warming Prevention Awards for its development of technology to reduce greenhouse gas emissions	February 2012	Kanagawa Prefecture	Development of energy-saving PC server
2nd Kanagawa Global Warming Prevention Awards for itsaccomplishments in reducing greenhouse gas emissions	February 2012	Kanagawa Prefecture	Construction of Fujitsu FIP Corporation's Yokohama Data Center
Ranked 10th in the 15th Nikkei Environmental Management Survey	January 2012	Nikkei Inc.	Environmental measures and environmental management initiatives
Banksia Environmental Award for Leading in Sustainability-Setting the Standard for Large organizations	November 2011	Banksia Environmental Foundation	Long running contribution to sustainability by Fujitsu Australia New Zealand (FANZ)
Ranked 1st in the Top 12 Green-IT Vendors list	October 2011	Computerworld	For reducing energy consumption and introducing technology to conserve energy and lower carbon emissions in ICT equipment as a "green-IT vendor"
Ranked 13th in Newsweek Green Rankings 2011	October 2011	Newsweek	For consideration of corporate environmental impact, environmental management and information disclosure policies
Second Contest of Corporate Ikimono-Nigiwai (Biodiversity) Activities Special Recognition Award	October 2011	Contest for Corporate Ikimono-Nigiwai (Biodiversity) Activities Organizing Committee	Fujitsu Group Malaysia Eco-Forest Park (Activities to regenerate tropical rainforests in Borneo, Malaysia, aiming to conserve biodiversity)
Green-IT Award 2011 Review Board Special Award in the category of "Savings in Society's Energy Consumption by IT"	October 2011	Green IT Promotion Council	Creation of "EcoCALC" eco-contribution estimation web tool and pro-active usage across the Group aimed at realizing an energy-saving society
FY 2010 Environmental goo Grand Prize Incentive Award, Business Division	May 2011	NTT Resonant Inc.	Environmental activities by Fujitsu (environmental website)