Reducing the Environmental Load of Factories and Business Offices

Advancing eco-friendly manufacturing through comprehensive environmental protection activities in our factories.

Applying the Green Factory and Green Office Systems

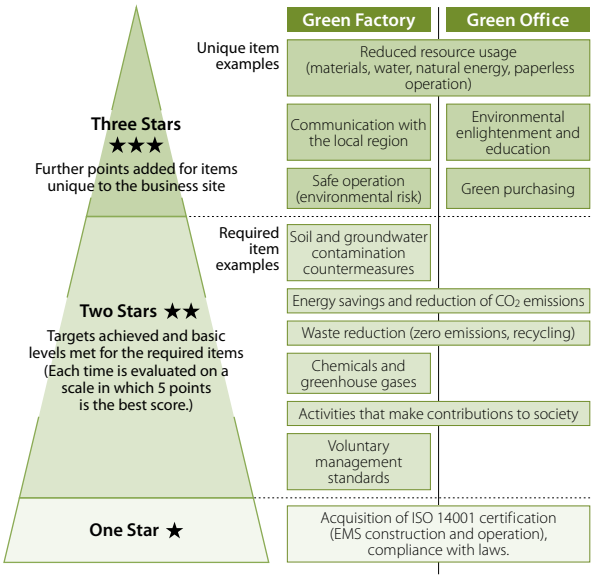
The Fujitsu Group's approach has been to work with our Green Factory Construction concept for environmentally conscious factories. Now, to advance this construction of green factories even further in our Stage V Environmental Protection Program, we have developed our Green Factory and Green Office systems, which render visible by comprehensive evaluation our level of environmental awareness and voluntary efforts.

In our Stage V Environmental Protection Program, we propose achieving a two star (★★) or higher level in the Green Factory or Green Office system at every one of our business sites by the end of fiscal 2009, that is, we will apply these systems not only to manufacturing facilities, but to office divisions as well. This aims at achieving this certification level in comprehensive evaluations at all business sites and at continuous improvement in our level of environmental awareness.

We saw fiscal 2007 as a period for preparing for these efforts and we implemented the evaluation standards and an operational trial. We promoted efforts towards energy savings and zero emissions* of waste materials and achieved a two star or higher level at all 67 sites.

*** Zero emissions**
Reducing landfill and simple incineration to zero by 100% effective reutilization of waste materials.

Certification Levels



Green Process Activities – Reduction of Environmental Load in Manufacturing Processes

Our Green Process activities are intended to save energy and reduce the amounts of chemical substances used and waste produced in manufacturing processes.

In a Green Process activity, we strive to reduce the environmental load (waste, chemical substance emissions, energy usage) of a manufacturing process by optimizing (and reducing costs) of raw material inputs, chemical substance usage, energy usage, and other aspects, and/or switching to alternatives with lower environmental load.

In these activities, we first assign an environmental load index (CG index*), an originally developed method, as a yardstick for determining target values for specific materials, chemical substances, and energy used in the manufacturing process, and then apply the PDCA cycle to guide activities at each quarter. These diverse efforts range from reviewing manufacturing technologies and particular processes to daily improvements from the workers themselves.

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

Green Process Example
Improving Polishing Quality in the Semiconductor Manufacturing Process

We manufacture ICs for AV equipment, home appliances, PCs, OA equipment, and other products at the Fujitsu Microelectronics, Ltd. Aizu Wakamatsu plant, a Fujitsu Group semiconductor manufacturing site.

At this plant, we worked to reduce the number of product surface flaws that occur in the polishing stage of the wafer process as a Green Process activity theme. In this effort we found that there is a tendency for the occurrence of flaws to depend on the shape of the grooves in the polishing pads used in the polishing process. On further investigation, we found that at the same time as reducing the occurrence of flaws, we could also increase the life of the polishing pads by optimizing the shape and depths of the grooves.

Furthermore, in the conditioning disks used to restore the surface of the polishing pads to their original conditions, we also improved quality of polishing pad restoration by adopting disks that reduced the variations in setting precision.

In addition to improving the polishing quality with this effort, we also extended the useful lifetime of the polishing pads. As well as reducing both the frequency of polishing pad replacement and the volume of waste polishing pads, this also led to a reduction in the total amount of polishing compound used in polishing tests at pad replacement. Compared to the situation prior to this effort, the polishing pad CG value was reduced by 60.2% and the polishing compound CG value was reduced by 21.5%.

We are aiming to increase this effect even further by deploying this effort at our Mie plant and Iwate plant.

Efforts to Prevent Global Warming

Basic Approach

We are working to reduce emissions of greenhouse gases associated with all our group business activities. These efforts include reducing emissions of CO_2 due to energy consumption and other greenhouse gases at our factories and offices and reducing emissions associated with transportation (see page

62). Furthermore, we are working to prevent global warming throughout all areas of business activity by contributing to reduced emissions of greenhouse gases by our customers, industry, and society in general by developing IT products that achieve energy savings and by providing IT solutions that have the effect of reducing environmental load (see the section starting at page 13).

Reducing Greenhouse Gas Emissions Associated with Manufacturing

In our Stage V Environmental Protection Program, we established the goals for annual CO_2 emissions from energy consumption of (1) holding emissions levels to under those of 1990 for business sites in Japan and (2) reducing emissions per unit of actual sales by 28% relative to fiscal 1990 levels by the group as a whole including overseas businesses, both by the end of fiscal 2010. We have implemented and are continuing to move forward with the following energy-saving measures.

- Energy-saving measures for equipment with a focus 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.
- Proper settings for office air conditioning, energy saved with lighting and office automation equipment.
- Promotion of visualized measurement of energy consumption and proactive use of that data.
- Use of natural energy sources such as solar and wind power (for street lighting and other uses).

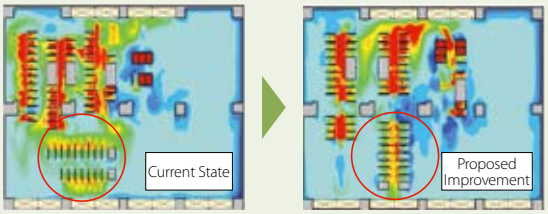
As a result of these efforts, our CO_2 emissions due to energy consumption in fiscal 2007 was about 1.147 million tons in Japan. While this was in increase of 176 thousand tons over the previous fiscal year due to increased production of semiconductor devices and plant acquisitions, it represents a 10.8% decrease from fiscal 1990.

CO_2 emissions for the whole group were about 1.345 million tons, and this corresponds to a 68.4% decrease compared to fiscal 1990 in per unit of actual sales terms.

Energy Saving Efforts at Computer Centers and in Air Conditioning Systems

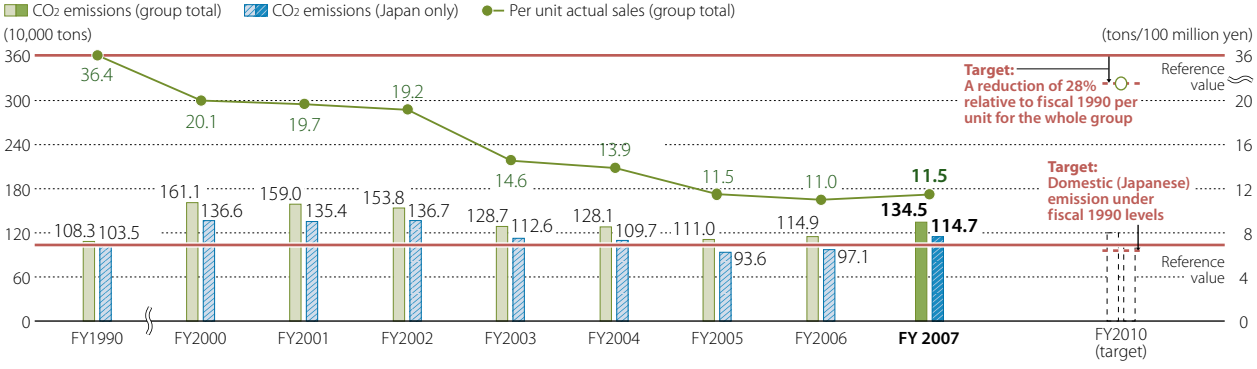
We perform activities from software development to hardware computer system verification, evaluation, and quality assurance at the Fujitsu, Ltd. Numazu plant. These activities take place at the computer center at the plant. Although we have adopted the traditional through-the-floor air conditioning to cool the computers (large-scale computers, servers, and other systems) efficiently at this computer center, starting in fiscal 2007 we have adopted the following "energy saving tune-ups" which aim at even further reductions in air condition energy consumption. These aim at increasing the efficiency of the air conditioning systems and we have reduced the number of operating air conditioning units and optimized and eased the operating conditions (settings).

- Use of an appropriate air conditioning capacity for the thermal load generated by the computers (avoiding excess or insufficient cooling capacity)
- Review of the computer layout (unification of the intake and exhaust directions and the layout in the parallel direction for the consolidated layout and air flow)
- Modification of the floor air vent positions (changed to the computer intake vent side) and selection of the intake vent type (slit, punch-formed, and other grill types).
- Implementation of prior studies using air flow and temperature distribution simulation



Air Flow and Temperature Distribution Simulation Example (floor plan)

Energy Consumption CO_2 Emissions (Japan only and Group Total) and Trends in CO_2 Emissions per Unit Sales (Group Total)



* CO_2 conversion coefficient for purchased electric power: Our results for fiscal 2002 and later are calculated as 0.407 tons CO_2 per MWh. (We expect the coefficient to be 0.34 tons CO_2 per MWh in 2010.)

* Actual sales: Consolidated sales compensated by the Bank of Japan's corporate goods price index (electrical equipment). (Per unit value = CO_2 emissions/actual sales)

Reducing the Environmental Load of Factories and Business Offices

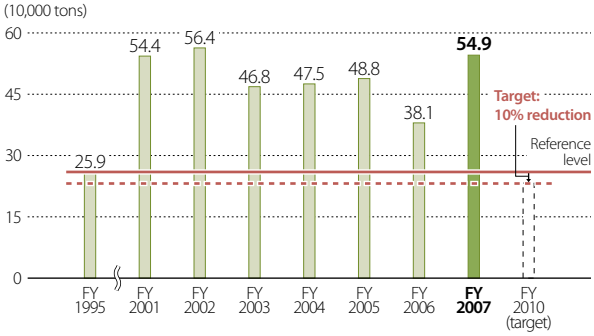
Cutting Emissions of Greenhouse Gases Other than CO_2

The semiconductor industry has established a voluntary action plan to cut the emissions of PFC, HFC and SF_6, which are all greenhouse gases.

We have set a target of reducing emissions of greenhouse gases other than CO_2 to 10% below the fiscal 1995 level by the end of fiscal 2010. Our Electronic Devices units are continuing to change over to gases with lower global warming potential as well as to install equipment to extract such gases on new manufacturing lines.

Converted to Global Warming Potential (GWP) figures, these gas emissions corresponded to about 549,000 CO_2 equivalent tons in fiscal 2007. Although there are differences in our scale of production and manufacturing processes, this represents a 112% increase from fiscal 1995.

Emissions of Greenhouse Gases other than CO_2
(Total for Electronic Devices)



Office CO_2 Emissions Reduction Activities

While we have created environmental protection programs and have optimized office air conditioner temperature settings and reduced power consumption by lighting and OA equipment, for fiscal 2007 we focused on and strove for "Energy saving PC power supply settings" as an activity that every one of our employees could become involved in.

Activity Status at Fujitsu

We are working to achieve energy saving using power supply control settings, such as turning off the monitor when the user is away from their desk and AC adaptors that turn off in the standby state. In these efforts, at the same time as calling on all employees to participate, we investigated the effects of PC energy saving efforts with the participation of about 900 employees at the sales division at company headquarters (Shiodome area), the SE division at Solution Square (Kamata), and the Corporate Environmental Affairs Unit.

At the same time we also looked into problems arising from using energy saving settings for sales and business PCs, and we switched to energy saving settings for the business PCs for which problems do not occur. When we verified the results of these efforts, we saw a reduction in power consumption from OA equipment compared to earlier usage patterns. Based on these results, we now provide only PCs for which the energy saving options have been set in advance for company-internal business PCs.

System Defender Box (SDB)* Energy Saving Activity

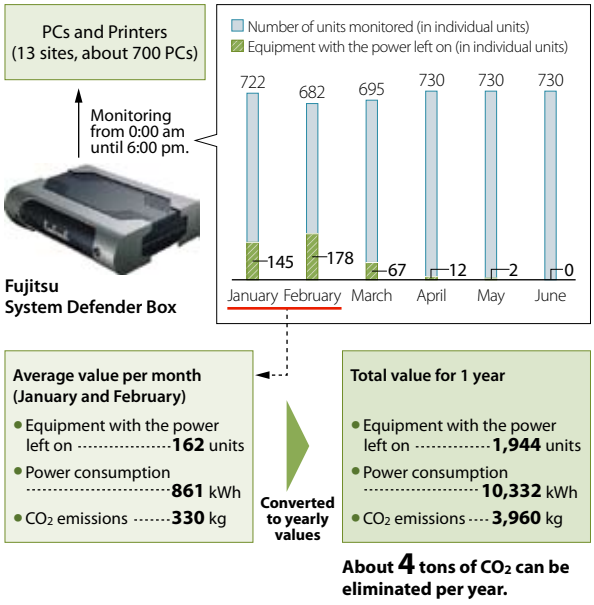
At the Fujitsu FSAS Central Headquarters, we focused on turning PCs off at night, installed a unique Fujitsu support tool, System Defender Box (SDB) at 13 locations, and implemented PC operation-time management from January through June in 2007. As a result, we found that we were able to reduce CO_2 emissions by about 4 tons annually.

Also, we increased our company-internal awareness of power saving by applying ECO yellow card stickers to equipment whose power is left on all the time and by providing detailed logs to group managers. Six months after we started measurement, we found that we had established the habit of turning off the power in OA equipment within the company.

Based on these results, we plan to deploy these efforts to the whole company at Fujitsu FSAS. This activity is also being promoted as a Qfinity activity (see page 28)

*** System Defender Box (SDB)**
This is a Fujitsu-developed automatic concentration tool that is used by IT resource management services. It is used by hardware products such as servers and PCs that are connected to a network and collects log and configuration information 24 hours a day, 365 days a year. This allows notification by email when a problem occurs or when there is a change to IT infrastructure, such as the operating states or load conditions of the various hardware.

Overview of Energy Consumption CO_2 Reduction Effects



About 4 tons of CO_2 can be eliminated per year.

Basic Policy for Chemical Substances Management

Basic Approach and Management System

We have established "Prevention of environmental risks that could lead to environmental pollution or adverse health effects due to the use of harmful chemical substances" as our basic policy for chemical substances management, we manage the amounts used for about 1,200 chemicals, and we work to reduce the amount discharged and implement appropriate management at every business site.

In fiscal 2007, we strengthened the functions of an existing chemical substances management system and increased the input operation efficiency for chemical substances registration and amounts handled management operations.

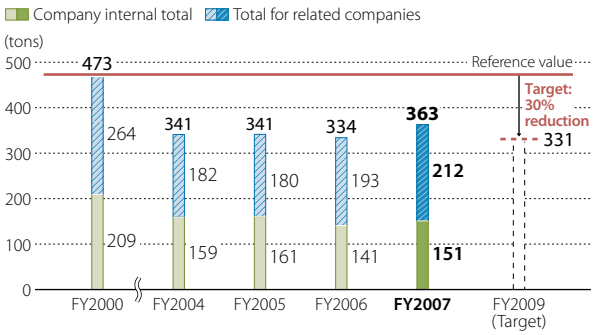
Results for Fiscal 2007

In our Stage V Environmental Protection Program, we propose the target of reducing VOC atmospheric emissions from business sites by 30% from fiscal 2000 levels by the end of fiscal 2009.

In addition to aiming for thoroughgoing and appropriate management of the target VOC chemicals and review of our manufacturing processes, in fiscal 2007 we also implemented reduction measures such as installing organic solvent collection units in semiconductor plants. As a result of these efforts, the total VOC atmospheric emissions for the whole group in fiscal 2007 was 363 tons, which corresponds to a 23% reduction from fiscal 2000 levels. The following graph shows the conditions in fiscal 2007.

Although we have not set targets for target PRTR substances, we are managing the amounts handled and the amounts emitted.

VOC Atmospheric Emissions



Fujitsu Receives 2007 PRTR Award for Excellence

The PRTR award was established in 2004 by the Center for Environmental Information Science to recognize companies and business sites that proactively promote communication concerning chemical substances.

In fiscal 2007, of the 14 applicants, our Iwate Prefecture plant (currently the Fujitsu Microelectronics, Ltd. Iwate plant) was awarded one of three Outstanding Performance Awards. This was the first time for a site in Iwate Prefecture to receive a PRTR award.

The Iwate plant uses Fujitsu's own CG (Cost/Green) index to promote green process activities that strive to save energy in the manufacturing process, manage chemical substances, or reduce waste production. While other Fujitsu Group plants are also promoting environmental activities using the CG index, the Iwate plant is particularly proactive in activities designed to achieve smooth communication with the local area, for example, by participating in the annual reporting event sponsored by the prefecture and explaining the plant's efforts at environmental protection to the residents of the local region. This award was given in recognition of those efforts.

Receiving the Award

Reducing the Amount of Waste Generated

Basic Approach

In working towards creating a recycling-minded society, we have adopted a basic 3R policy (reduce, reuse and recycle) and in aiming for an even higher level of 3R achievement, we encourage all our employees to separate waste materials into different categories for more effective recycling.

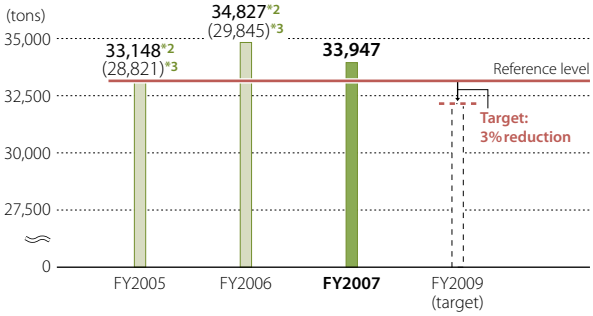
Fiscal 2007 Performance

In the Stage IV Environmental Protection Program, we set the goal of reducing the amount of waste generated by our business operations by 3% compared to fiscal 2005 levels by the end of fiscal 2009.

The total amount of waste generated by the Fujitsu Group came to 33,947 tons in fiscal 2007. While the results for the previous fiscal year corresponded to a 2.5% decrease, they corresponded to a 2.4% increase compared to fiscal 2005. This increase was due to increased production of semiconductors.

Reducing the Environmental Load of Factories and Business Offices

Amounts of Waste Generated*1



*1 Statistics for 12 Fujitsu sites and 30 Group companies.

*2 The values for 2005 and 2006 include the values for Fujitsu Semiconductor Technology, which became an object of consolidation starting in 2007.

*3 Values in parentheses are for the range that was reported the previous year.

Effort to Recycle Fluorite

While hydrofluoric acid is indispensable in semiconductor manufacturing, it also generates large amounts of sludge in effluent wastewater processing. At the Fujitsu Microelectronics, Ltd. Mie plant, we succeeded in creating and recovering high purity fluorite from wastewater with high concentrations of hydrofluoric acid by adopting a revolutionary new technology. This new technology allowed us to reduce the amount of sludge generated by about 40%. Furthermore the recovered fluorite can be used as a raw material for making hydrofluoric acid.

Recovered High-Purity Fluorite

Responding to Soil and Groundwater Pollution

We have reviewed our internal rules established in fiscal 2006 in response to soil and groundwater problems and will handle such problems based on these revised rules for soil and groundwater surveys, policies, and disclosure.

In the future, at the same time as performing planned surveys and, if pollution is discovered, implementing cleanup operations and countermeasures appropriate for the conditions at each business site, we will also disclose relevant information in collaboration with government authorities.

Use of Special-Purpose Returnable Containers for Semiconductors

In fiscal 2007, as a result of a voluntary survey we performed, we found soil and groundwater contamination at six business sites. For all six of these, we reported the state of the contamination and explained the countermeasures we would take to the relevant authorities and the local citizens. We have been implementing these countermeasures at all six sites since last year.

See the following web page for an overview of our efforts at solving soil and groundwater contamination problems, the results of surveys on soil and groundwater contamination at our business sites in Japan, and cleanup measures.

Groundwater Conditions

We have dug monitoring wells for monitoring the influence outside our sites of contamination due to groundwater at business sites where soil or groundwater contamination has been found and continuously monitor those wells. The table below lists the largest of the most recent measurements for chemicals whose measurements are recognized to have exceeded legal limits in fiscal 2007 and are due to past business activities.

Business Sites and Chemical Substances which have been Recognized to Exceed Legal Levels in Fiscal 2007

Site Name	Location	Cleanup and countermeasure status	Monitoring well maximum value (mg/ℓ)		Regulation value (mg/ℓ)
			Substance	Measured value	
Kawasaki plant	Kawasaki, Kanagawa Prefecture	We are continuing to cleanup VOCs by pumping and	Cis-1, 2-dichloroethylene	0.768	0.04
			1, 1-dichloroethylene	0.022	0.02
Suzaka plant	Suzaka City, Nagano Prefecture	We are excavating and removing contaminated soil	PCB	0.0007	Must not be detected.
Oyama plant	Oyama City, Tochigi Prefecture	We are continuing to cleanup VOCs by pumping and aeration and other methods.	Trichloroethylene	3.437	0.03
			Cis-1, 2-dichloroethylene	5.242	0.04
Nagano plant*	Nagano City, Nagano Prefecture	We plan to implement a policy of VOC cleanup by pumping and aeration.	Cis-1, 2-dichloroethylene	0.30	0.04
Minami Tama plant (retired)	Inagi City, Tokyo	We have completed cleanup using the in situs iron admixture method (powdered iron insertion) We are monitoring groundwater.	Tetrachloroethylene	Below the standard value	0.01
			Cis-1, 2-dichloroethylene	Below the standard value	0.04
Shinetsu Fujitsu	Shinano machi, Kamimino-chi Gun, Nagano Prefecture	We are continuing to cleanup VOCs by pumping and aeration and other methods.	Cis-1, 2-dichloroethylene	0.18	0.04
			Trichloroethylene	0.043	0.03

* Business sites where groundwater contamination due to the business site was verified for the first time in the fiscal 2007 survey by monitoring wells used to monitor for influence outside the site.