Environmental Measures for Products

We have adopted a Group approach to eco-design for all products, and in cooperation with our business partners we are making efforts to reduce environmental burden throughout product life cycles.

Fujitsu Group Environmental Protection Program (Stage IV) Targets

- All business units to provide Super Green Products (with top-class environmental characteristics) within their principal product line offerings by the end of fiscal 2006.
- All Fujitsu-brand products to be made free of Fujitsu-specified hazardous substances by the end of fiscal 2005.

Fiscal 2004 Performance

- We have developed Super Green Products in 12 product categories, including notebook PCs, semiconductors and other electronic components.
- A database of components for products free of hazardous substances has been made; a development infrastructure for related standards has been prepared; and 90% of components used in common throughout the Group have now been replaced with those free of hazardous substances.

Super Green Products Development

From fiscal 2004, IT products and communications hardware, semiconductor devices and other electronic components are being developed as Super Green Products. In 2004, 12 newly developed products were designated as Super Green Products.

Definition of Super Green Products

"Super Green Products" are those that meet the preconditions for Green Products (see P45) and are top class* in terms of low energy consumption, 3R design and technology, non-use of hazardous substances, materials and technology that contribute to the environment and other environmental considerations. Super Green Products are products or systems with superior environmental consideration than others we supply or are available on the market. Products that receive environmental labels or awards, or official approval from third-party organizations, are also eligible.

Super Green Products Developed in Fiscal 2004

Fujitsu Limited (7 products)

- MO disk drive (DynaMO1300LT, 640LT)
- Network server (IPCOM-S Series)
- Notebook PC (FMV-BIBLO NB 80K)
- Hard disk drive (MHV2 AH Series)
- MPEG2 encoder LSI devices
- FRAM (MB85R256S)
- MPU for high-performance servers

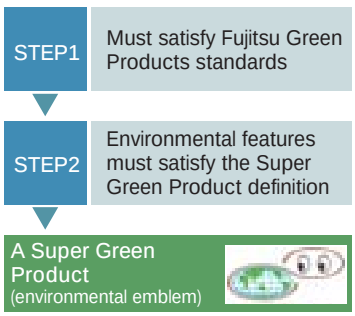
Group Companies (5 products)

- A6 size scanner (fi-60F) (PFU)
- Electrical transceiver module (FCU-010M 10GECX4 module) (Fujitsu Components)
- SAW duplexer (D6GZ/D6GV series) (Fujitsu Media Devices)
- Functional polymer capacitor (FPCAP-RE L8 series) (Fujitsu Media Devices)
- Wireless LAN module (MBH7WLZ07) (Fujitsu Media Devices)

Positioning of Super Green Products

* Top class: Environmental considerations that represent a world first, a Japan first, or an industry first, the world's smallest, Japan's smallest or the industry's smallest, etc.

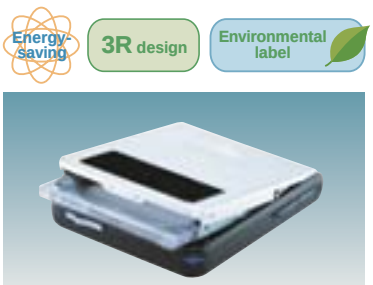
Super Green Product Requirements



Example of Super Green Product Development

Notebook PC (FMV-BIBLO NB80K)

- Developed and adopted large-size bio-based plastic housing with low environmental burden (see P58). Over the product life cycle, this reduces CO_2 emissions by 15% compared with petrochemical plastics.



MO Disk Drive (DynaMO 1300LT, 640LT)

- Reduced operational electric current by up to 10%.
- Reduced volume and weight by approx. 45% from previous models.
- Obtained the industry's first EcoLeaf environmental lable (Type III label) to be given to an MO disk drive.

Network Server (IPCOM-S Series)

- By combining the capabilities of multiple network devices in a single unit, CO_2 emissions have been reduced by 40%.
- The unit takes up one third less space and uses one third fewer cables than previous equipment.

Elimination of Hazardous Chemical Substances

To further strengthen environmental considerations in product development, the Fujitsu Group has drawn up a list of substances, based on Japanese and foreign legal restrictions, that must not be used in products, and we use product evaluation and Green Procurement to ensure that the scheduled hazardous substances are not used. To meet the requirements of the European Union's RoHS[*1] directive, we have also decided not to use four substances[*2] (lead, mercury, cadmium and hexavalent chromium), and their usage is currently being eliminated.

*1 RoHS: the EU directive on "Restriction of the use of certain hazardous substances in electrical and electronic equipment."
*2 Substances containing polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE) listed in the RoHS directive have already been eliminated.

Fujitsu Group List of Banned Substances

- Polychlorinated biphenyls (PCBs)
- Polychlorinated naphthalenes (with 3 or more chlorine atoms)
- Asbestoses
- CFCs
- Specified halons
- Carbon Tetrachloride
- 1,1,1-Trichloroethane
- Bromochloromethane
- Methyl bromide
- HBFCs

(Substances Depleting the Ozone Layer)

- Polybrominated biphenyls (PBBs)
- Polybrominated diphenyl ethers (PBDEs)
- Short-chained chlorinated paraffins
- Bis (tri-n-butyltin) oxide (TBTO)
- Tributyl tins (TBTs), Triphenyl tins (TPTs)
- Specified amines
- Azo dyes and azo pigments that generate specified amines
- Chlordanes
- DDT
- Aldrin
- Endrin
- Dieldrin
- Hexachlorobenzene
- N,N'-ditolyl-p-phenylenediamine, N-tolyl-N'-xylyl-p-phenylenediamine and N,N'-dixylyl-p-phenylenediamine
- 2,4,6-tri-tert-butylphenol
- Toxaphene
- Mirex

Fujitsu Group List of Substances to Be Totally Abolished

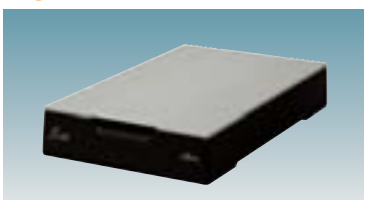
- Cadmium and its compounds
- Hexavalent chromium compounds
- Lead and its compounds
- Mercury and its compounds

Checking for Hazardous Chemical Substances in Purchased Components and Materials

We check the level of chemical substances contained in the components and materials we purchase using standard methods in accordance with the Japan Green Procurement Survey Standardization Initiative (JGPSSI), which was established primarily for electrical and electronic manufacturers. The results of these measurements for individual components and materials from suppliers are recorded in a Greeen Information Database (GIDB) and a system has been put into operation by which selections are made taking into account environmental considerations at the design stage.

Over 90% of general purpose components (semiconductor devices, resistors, and other individual circuit components) have already been replaced with those containing no hazardous substances, although some need improved heat-resistance.

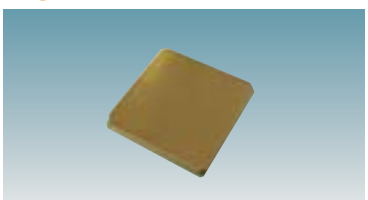
Energy-saving 3R design



Scanner (fi-60F) (PFU)

- In low-power mode, uses less than 2.0W, putting it at the top of the scanner category in the Energy STAR program.
- The most compact scanner in the A6 class.

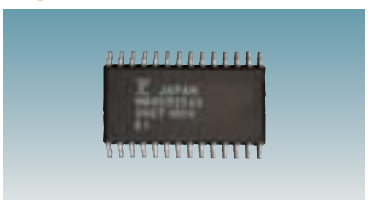
Energy-saving



Microprocessor for High-Performance Servers

- By adopting the most advanced 90nm CMOS technology, environmentally related performance (comparing the electrical energy consumed by the LSI device in performing a specified volume of work) has been improved by over 60%.

Energy-saving 3R design



FRAM (MB85R256S)

- In comparison with BBSRAM, because a battery is not needed for data backup, electrical power consumption is reduced by about 20%.
- By shrinking the size of the non-volatile high-induction memory cell which can read and write quickly, approx. 54% less material is used.

Environmental Measures for Products

Eco-friendly Design

We have been implementing our own environmental assessments for products since 1993 and developing products that reflect environmental considerations in such areas as energy-saving, 3R design,* chemical substances, packing materials, and information disclosure.

Since 1998, to further strengthen environmental considerations in product development, we established Green Product Evaluation Standards and positioned the notably eco-friendly products that satisfy them as Green Products.

* 3R Design: Prioritizes Reduce/Reuse/Recycle considerations at the design stage.

Developing Green Products

In fiscal 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 higher levels of consideration for the environment. We call these Product Environmental Green Assessment Regulations, and they have helped to both strengthen Green Product development efforts and make them more efficient.

Also, in carrying out life cycle assessments (LCAs)* for Green Products, (see P46), in order to comply with industry and other organizations' environmental labeling standards as well as meet our customers' procurement requirements, we reviewed our previous LCA regulations, including evaluation stages and the units in which environmental burden is calculated, revising them and putting them into a database.

* LCA (life cycle assessment): Quantitative environmental burdens are imposed by products and services throughout their life cycles. Here, the term life cycle comprises the entire flow from the extraction of natural resources, through the production of raw materials, the manufacturing and use of the product, and eventually its scrapping or recycling.

Green Product Evaluation Mechanism

STEP1	Evaluation based on Product Environmental Assessment Regulations
▼	Total evaluation points: over 90
STEP2	Evaluation based on Green Product Evaluation Regulations
▼	Product meets all relevant criteria.
Green Product	

Reducing Energy Consumption

Complying with the Law Concerning the Rational Use of Energy

Our servers, workstations and PCs, as well as hard disk drives, all surpass the energy consumption criteria specified in Japan's Law Concerning the Rational Use of Energy for 2005 by over 500% (AAA level performance).

Our PCs, workstations, printers, displays and scanners also meet the standards of the International Energy STAR Program, and have reduced the power consumed in standby mode.

Energy-saving PCs

When the power is turned on in our PCs a linked power socket for the display is also switched on at the same time.

When the main power switch is turned off and the PC enters the low-power consumption "suspend" mode, AC power is no longer supplied to the display. This gives superior low-energy performance.

3R (Reduce/Reuse/Recycle) Design

Resource-saving Design

PCs

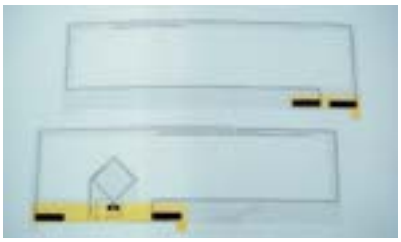
Our notebook computers make effective use of limited resources by using recycled plastics and recycled magnesium alloys. Bio-based materials are used in the housings of notebook PCs and LSI device packages. Our approach to design reduces the amount of petrochemical resources used (see P58).

Our desktop PCs can be opened without special tools, and additional hard disk and memory can easily be exchanged and installed.

Car Navigation Systems

Fujitsu Ten, Ltd. modified the three-dimensional GPS antenna previously used in its car navigation systems into a film and combined it with a film-type TV antenna. This simplifies installation and reduces the impact on the driver's field of view while improving the appearance. The fact that size and weight are both about one tenth of the previous type also reduces energy requirements.

The new antenna was adopted for all ECLIPSE model audio-visual navigation systems from July 2004, and steady extension to other products is planned.



World's first combined TV/GPS film-type antenna

Recycle Design

We continually apply environmental considerations in our product development, including indicating the materials used in plastic parts, utilizing recyclable thermoplastic paint, and using soy oil-based inks on packing materials.

During new product development, disassembly manuals are prepared for those who will be processing the product when its useful life is over.

Examples of Green Products

PRIMEPOWER 2500

Printia LASER XL-5900

FOMA® F700i

Disclosure of Environmental Information on Products

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

Disclosure of Environmental Information on Products via the Internet

We disclose information on adherence to Green Procurement laws*1 in our servers, workstations, PCs, disk drives, displays, printers and scanners on the Green Procurement Network*2 web pages.

*1 Green Procurement laws: Japanese laws affecting procurement on environmental grounds.
*2 Green Procurement Network: This is a nationwide network in Japan encouraging consumers, enterprises and government to further green procurement.

Disclosure of Environmental Information via Environmental Labels

We apply environmental labels to our products in accordance with ISO14020 (the international standard for environmental labels). There are three types, as shown on the right.

Environmental Labels (Classification based on ISO14020 international standards concerning environmental labels)

Type I

Environmental details concerning products approved by a third-party organization upon voluntary application by the manufacturer

Eco-mark
(Certified by the Japan Environmental Association)
Since becoming Japan's first desktop PC manufacturer to receive Eco-mark certification in January 2001, we have acquired certification for printers as well.
http://www.ecomark.jp/english/index.html

Type II

Environmental details concerning products meeting independent criteria set by the manufacturer

Environmental Emblem
This is our own environmental label.
It is indicated on Green and Super Green products for which special consideration has been given to environmental factors.
http://www.fujitsu.com/global/about/environment/policy/emblem_1994.html

Energy-saving Labeling
This is indicated on products that meet the Law Concerning the Rational Use of Energy.

Type III

Product's quantitative environmental burden indicated on the label

EcoLeaf Environmental Label
(Certified by Japan Environmental Management Association for Industry)
In May 2003, Fujitsu became Japan's first notebook PC manufacturer to receive EcoLeaf environmental label certification.
No. AS-03-001
http://www.jemai.or.jp/english/ecoleaf/index.cfm

3R Eco-label for PCs
This label is used for PCs that meet Japan Electronics and Information Technology Industries Association standards.
http://www.jeita.or.jp/english

The International Energy Star Program
This logo is displayed for computers (PCs, workstations), displays, printers and scanners registered with the program.
http://www.eccj.or.jp/ene-star/index_esu.html

Environmental Information Disclosure Based on Life Cycle Assessment (LCA)

LCAs are obligatory for all Fujitsu Green Products, and by using a proprietary database of LCA standards for each product category, Green Products can be evaluated efficiently. We utilize this LCA activity in calculating environmental effectiveness factors, obtaining EcoLeaf environmental labels, and calculating social costs. LCA results have been presented in academic conferences, and information from them has been actively used in communicating with our customers.

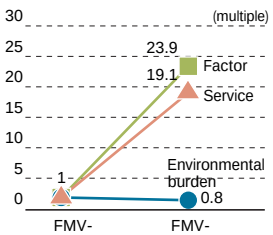
Our LCA communications activities, including EcoLeaf labeling and disclosure of environmental efficiency factors, received an award at the first Forum of the Life Cycle Assessment Society of Japan. (December 2004)

Fujitsu LCAs

Calculating Eco-efficiency Factors

Eco-efficiency is a breakthrough technique capable of expressing the environmental burden of products (denominator) and improvements in services such as functions and performance (numerator) by means of an new-old ratio. It yields eco-efficiency factors.
How to calculate eco-efficiency factors:
Added value of improvements in functions and performance (new/old ratio) ÷ The product's environmental burden (new/old ratio)
http://www.fujitsu.com/global/about/environment/activity/p_factorx.html

Notebook PC Eco-efficiency Factor Calculation



Obtaining EcoLeaf Environmental Labels

Fujitsu was the first in the industry to obtain third-party recognition in the form of the EcoLeaf environmental label for its notebook PCs. We went on to obtain it for desktop PCs, displays and MO drives.

Calculating Social Costs

Application of our LIME* approach enables the monetary cost of a product's environmental burden throughout its entire life cycle to be readily calculated.

* LIME: Life cycle impact assessment method based on endpoint modeling. Method developed for Japanese National LCA Project.

Social Costs of the FMV-830MG Notebook PC