

Reducing Environmental Burdens from Our Business Activities

At the Fujitsu Group, we are actively carrying out a range of initiatives to reduce the various environmental burdens that result from our business activities. These initiatives include introducing highly environmentally efficient equipment and utilizing systems to make power consumption visible. We are leveraging the expertise we are constantly accumulating through these activities to provide our customers with effective solutions.

In Data Centers

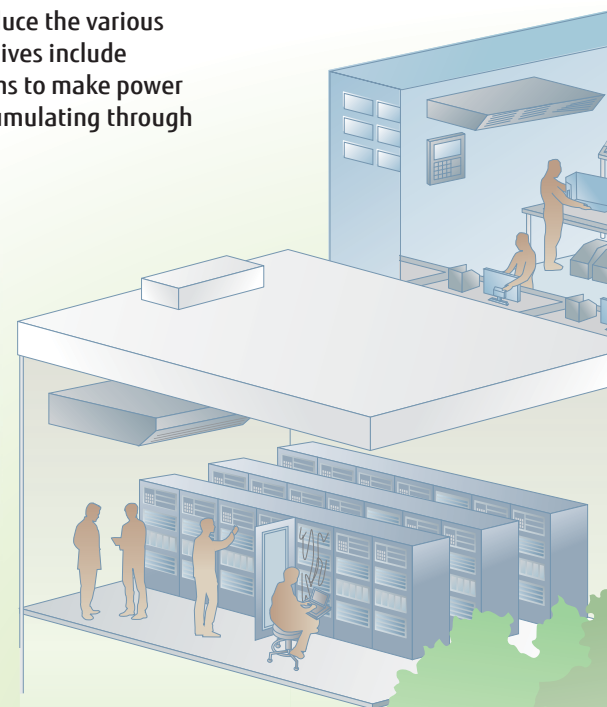
- State-of-the-art Eco-Friendly Data Center, New Annex of Tatebayashi System Center ▶ Please refer to P12
- Global development of the Eco-Friendly Data Center ▶ Please refer to P12
- The "London North" data center is utilizing the results of an in-depth survey to realize significant energy savings ▶ Please refer to P47

Development Center Adopts Cloud Computing to Consolidate and Reduce by Half the Number of Servers

Fujitsu's Numazu Software Development Cloud Center

Reduction in CO₂ of about 1,340 tons

Since fiscal 2008, we have consolidated the development-environment servers previously scattered across six sites in Japan into the Numazu Software Development Cloud Center and made a cloud-based development environment. Our objective was to reduce the workload generated by the activities of our software developers and center operators. We are currently switching to cloud computing in three stages; virtualization, standardization, and automation. Through this initiative, we aim to reduce our environmental burden and our costs. We expect to decrease the number of servers in fiscal 2010 by approximately 50% compared to fiscal 2008, and to reduce CO₂ emissions by about 1,340 tons.



Introduction of the extremely energy efficient Turbo Chiller

Fujitsu Tatebayashi System Center

CO₂ reduced about 2,200 tons

We have significantly improved energy efficiency by introducing a Turbo Chiller, achieving a reduction in CO₂ emissions of about 2,200 tons a year.



The Turbo Chiller

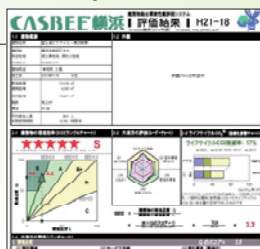
Evaluation based on the "Comprehensive Assessment System for Building Environment Efficiency (CASBEE)"

Fujitsu FIP Corporation Eco-Friendly Construction

Fujitsu FIP Corporation is currently constructing an Eco-Friendly Data Center that utilizes energy saving air-conditioning systems and also systems for recycling rain water and for generating solar power.

Thanks to these technologies, the new Data Center achieved higher evaluation results based on CASBEE*1 compared to the conventional Data Center.

In addition, Fujitsu Limited is providing support for the construction of a new plant for Fuji Ecocycle, which is a subsidiary of Fujitsu General Limited. The new plant will utilize highly efficient lighting, while materials for the plant interior have been chosen based on measures to prevent sick building syndrome. The plant is currently being evaluated based on CASBEE*2.



*1 FY2009: based on self-assessment report submitted to Yokohama City

*2 FY2009: based on self-assessment report submitted to Hamamatsu City

Development of "spot" air-conditioning system

Fujitsu Opens New Annex of Tatebayashi System Center

Improving energy saving in operations by 25 %

We developed a "spot" air-conditioning system to target those locations within the data center where hot air tends to accumulate, achieving an approximate 25% improvement in energy saving compared to a conventional air-conditioning system.



Upgrading our environmental management through ICT

In the Fujitsu Group, we are positively leveraging ICT in order to further upgrade our environmental management

Example of our utilization of ICT

Collecting and analyzing environmental-performance data on the Fujitsu Group's global activities
Global Environment Database System

Effective operation of environmental management systems
ISO 14001 Green Management System

Management of restricted chemical substances in products
REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) compliant chemical substances control system "PLEMIA/ECODUCE"

Traceability management for used ICT equipment
Integrated recycling information management system

Virtual manufacturing
Three dimensional visualization verification simulator (VPS: Virtual Product Simulator)

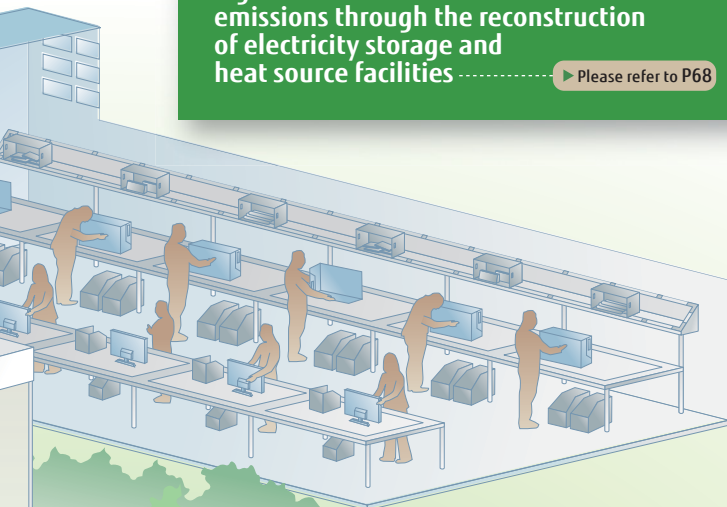
Chemical substance management in plants
Chemicals Control System (FACE)

Environmental Management Information Systems
<http://www.fujitsu.com/global/about/environment/management/ems/information-sys/>

In Plants

- Compliance and air conditioner energy-saving initiatives Please refer to P68
- Significant reductions in CO₂ emissions through the reconstruction of electricity storage and heat source facilities Please refer to P68

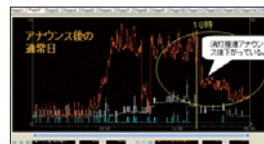
- Improved efficiency for the air-conditioner-use cold water supply within the LSI packaging process Please refer to P70
- Reduction in sludge resulting from the silicon grinding waste-water treatment process Please refer to P70
- Reduction in IPA gas emissions Please refer to P71



Making power consumption visible

Fujitsu Numazu Plant and PFU Ltd. Saving more energy

The Fujitsu Numazu Plant has been publishing the trends in its energy consumption on our intranet, which is helping to support its energy saving efforts such as encouraging employees to turn off lights



Also, PFU Ltd., has introduced a system that can monitor the energy being used on every floor on an hourly basis. The system, which is managed by the ProDeS Center (the production and development center), monitors power consumed by equipment such as lighting and air conditioners and the data it provides are utilized in energy-saving initiatives. Also, by publishing information on cost reductions and environmental burdens within the company, PFU is building a foundation on which it can promote environmental programs to all its employees.

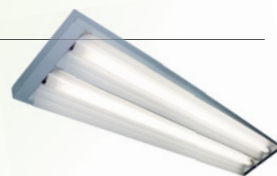
In Offices

- Achieving zero emissions of waste paper through a Nationwide Paper Recycling System Please refer to P72
- Reducing CO₂ emissions by expanding the application of modal shifts in distribution Please refer to P74

Installing highly efficient reflector plates that increase the brightness of fluorescent lights

PFU Ltd. Improving energy savings

The ProDeS Center Office has achieved energy savings by installing highly efficient reflector plates, enabling it to reduce the number of fluorescent lights it requires. It has also saved energy by a campaign to make sure employees turn lights off.



Encouraging 'eco-commuting' by walking and cycling

Fujitsu Isotec (FIT) Reduced CO₂ by about 14.5 tons

Since July 2009, Fujitsu Isotec has been implementing a campaign to encourage employees to leave their vehicles at home and commute to work on foot, by bicycle, or by public transport. By March 2010, this initiative had achieved an approximate 14.5 ton reduction in CO₂ emissions.



Offices with the highest levels of environmental standards

Fujitsu Australia Ltd. (FAL) Saving resources

The Gauge Building where FAL has its offices has been awarded the 6 Star Green Star, which is the highest possible environmental rating in the commercial sector under Australia's environmental building design certification system. This building utilizes water recycling, co-generation, and a range of other technologies to achieve impressive energy and resource savings.



Acquiring certification for measuring and reducing CO₂ emissions

Fujitsu Services Ltd. Reduced CO₂ by 1.7%

Following the efforts made by Fujitsu Services Ltd. to reduce CO₂ in its business operations in fiscal 2008, in March 2010 Fujitsu was presented with the 'Carbon Trust Standard' for reducing its carbon footprint by 1.7% (1,483.7 tons), compared to its averaged emissions in fiscal 2006 and fiscal 2007. The Carbon Trust introduced the Carbon Trust Standard to evaluate the methods companies use to measure and reduce their CO₂ emissions.



The Fujitsu Group's Green ICT Is Helping to Reduce the Environmental Burden from Society and the Entire World

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.

In Agriculture



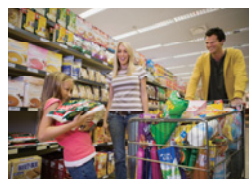
Farmland Management System
Farmland Management GIS

CO₂ emissions
reduced by about **50%*1**

Agriculture Revitalization
Promotion System
NetSeeds

CO₂ emissions
reduced by about **59%*1**

In Department Stores and Supermarkets



POS Systems for Mass Merchandisers
GlobalSTORE III

CO₂ emissions
reduced by about **30%*1**

Internet Shopping System
i . market

CO₂ emissions
reduced by about **25%*1**

In Factories



Facilities Management System
Futuric

CO₂ emissions
reduced by about **47%*1**

Production Scheduling System
GLOVIA/SCP FA

CO₂ emissions
reduced by about **60%*1**

Environmental Information System
(Contaminant emissions management)
e-FeINS

**Environmental risk
reduction**

Environmental Performance System
Records Management System
SLIMOFFICE

Visualization of environmental
performance data

In Networks



Network Server
IPCOM EX Series

CO₂ emissions
reduced by about **55%*3**

Optical Fiber Technology
FLASHWAVE 9500

CO₂ emissions
reduced by about **60%*2**

Gigabit Ethernet Based PON System
GE-PON ONU

CO₂ emissions
reduced by about **41%*2**

NGN Platform System
UB300

CO₂ emissions
reduced by about **74%*2**

Real-Time Video
Transmission Equipment
IP-900 Series
(IP900E/IP-900D/IP-910E/IP-910D)
CO₂ emissions
reduced by about **24%*2**

In Medicine



Medical Electronic Records Solution
HOPE/EGMAIN-GX

CO₂ emissions
reduced by about **30%*1**

Medical Image Information System
HOPE/DrABLE-EX

CO₂ emissions
reduced by about **21%*1**

Health Management System
HOPE/webH@ins

CO₂ emissions
reduced by about **55%*1**

In Schools



SaaS-type e-learning
e-Learning Navigware

CO₂ emissions
reduced by about **50%*1**

Business System for
Educational Institutions
Campusmate-J

CO₂ emissions
reduced by about **54%*1**

Service for Notification of Arrival
at or Departure from School
Active RFID tags

CO₂ emissions
reduced by about **28%*1**

In Local and National Government



Automatic ID Card Delivery System
Conbrio-J

CO₂ emissions
reduced by about **66%*1**

Web Creation Support System
GwebLink-Neo

CO₂ emissions
reduced by about **90%*1**

Public Works Operation
Management System
Public Works Operation
Management System

CO₂ emissions
reduced by about **18%*1**

*1 Calculated using an environmental influence evaluation procedure developed by Fujitsu Laboratories Ltd.

*2 Compared to the power consumption of a conventional product when in use

*3 Reduction effect when a rack-type server as used about three years ago is concentrated in a blade unit (SAN boot structure)

*4 Compared to the power consumption of other models when in use

*5 Not for sale in Japan

*6 Maximum target value. Excluding the energy saving effects due to the ICT equipment (such as servers and storage units) itself.

*7 Compared to use by the manufacturer (annual) (actual results from April 2009 to March 2010)

*8 Fujitsu actual measurements for a five-server structure where four were not operational during the night

*9 A case using Fujitsu's Numazu Software Development Cloud Center. Deployment/operation of development/execution environments where ICT resources are virtualized and standardized is automated. Listing of business services and visualization of operational status support reduction of operational workload and reduce the number of servers.

*10 Results of trial calculations based on an example within Fujitsu involving 300 computers. Note that the values shown here are subject to variation with conditions of the measurement and calculation and with the way the products are used.

In Data Centers



Multipoint Temperature Management
(optical temperature sensor)
Real-time multipoint temperature measurement technology

Visualization of temperature distributions

Server automation and visualization software
ServerView, Resource Coordinator VE

CO₂ emissions reduced by about 17%*8

Green Facility Construction Support
Green Infrastructure Solution

CO₂ emissions reduced by about 50%*6

Energy saving technologies for electronic and electrical equipment
Gallium nitride HEMT (High Electron Mobility Transistor)

Power loss in power-supply unit is less than one third that of a conventional unit

Private cloud environment construction software
Systemwalker Service Catalog Manager V14g
Systemwalker Software Configuration Manager V14g
Systemwalker Runbook Automation V14g
ServerView Resource Orchestrator

Supporting a number of servers reduced by about 50%*9

Mission-critical IA server
PRIMEQUEST 1000 Series

CO₂ emissions reduced by about 66%*2

Blade Server
PRIMERGY BX900

CO₂ emissions reduced by about 40%*3

PC server for the data center
PRIMERGY CX1000

CO₂ emissions reduced by about 13%*4

Disc array
ETERNUS DX60, DX80, DX90

CO₂ emissions reduced by about 43%*2

Energy saving and cooling technologies
Water-cooling unit+energy saving, low-noise fan

Cooling fan's electricity consumption reduced

In Financial Institutions



ATM Systems
ATM Asset Distribution Package

CO₂ emissions reduced by about 38%*1

Credit Union Internal Information System
SB-Square

CO₂ emissions reduced by about 28%*1

Foreign Exchange Image OCR System for Financial Institutions
KMASTER

CO₂ emissions reduced by about 59%*1

At Fishing Grounds



Fishery and Oceanographic Information Provision Service
Toredasu

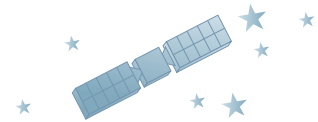
CO₂ emissions reduced by about 20%*1

Used for sustainability of fishery resources.

In Outer Space



Greenhouse Gas Monitoring Technology Satellite
Contributions to the "IBUKI" project



In Environmental Management



Environmental management strategy proposals
Environmental management consulting services

Environmental management upgrades

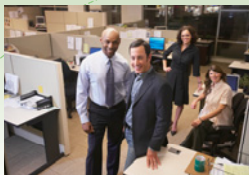
Control Solutions for Chemical Substances in Products
PLEMIA/ECODUCE

Compliance with REACH regulations

Environmental Performance Records Control System
SLIMOFFICE

Making environmental performance visible, optimizing energy use

In Office Buildings



Software for PC power saving
Systemwalker Desktop Patrol V14g

Power consumption reduced by about 40%*10

Notebook PCs for corporations
FMV-LIFEBOOK

Compliant with the International Energy Star Program

Workflow System for Human Resources and General Affairs
GLOVIA Exchange USE

CO₂ emissions reduced by about 48%*1

A standby power requirement zero PC
ESPRIMO E7936
0-watt, P22W-5 ECO IPS

Standby power consumption zero watts*5

Electronic Forms Management Software
Interstage List Works

CO₂ emissions reduced by about 56%*1

Building Management System
Futuric

CO₂ emissions reduced by about 47%*1

ICT Resource Management System
SupportDesk Expert

CO₂ emissions reduced by about 35%*1

In Homes



PC Recycling
Recycling of Fujitsu PCs

Resource recycling

Green Power Certificate System Supported PCs:
The FMV-BIBLIO LOOX, U/CSN, and ECO models

The popularization of green power

In Traffic and Transportation



Traffic Eco-points System
"DESUCA" (Tosa Electric Railway Co., Ltd., and Kochi-ken Kotsu Inc.)

CO₂ emissions reduced by about 2,866 tons*7

Operations Support System
In-Vehicle Station (Dejitako)

CO₂ emissions reduced by about 19%*1

Distribution Center System
LOMOS/DJ

CO₂ emissions reduced by about 58%*1

Non-stop toll collection system
ETC Infrastructure System

CO₂ emissions reduced by about 24%*1

CO₂ emission calculation system
LOMOS/EC

Making visible the results of a modal shift



Please refer to the Fujitsu homepage for other information on our environmental solutions.
<http://jp.fujitsu.com/solutions/ecol/>

A Green ICT Case Study

Of **ICT**

Zero Power Consumption in Standby Modes: Zero-Watt Displays and PCs

The European Union has passed a law that requires electrical equipment in standby mode to consume less than one watt by 2010 and less than 0.5 watt by 2013. As a leading supplier of green ICT products, Fujitsu has already surpassed these regulatory requirements as its groundbreaking displays and PCs consume absolutely no power when in standby mode.

Fujitsu's original design technologies for displays have enabled us to achieve zero watt in standby mode without any loss of image quality. An Eco button and automatic brightness controls, enable an energy saving of 50% during use.



In addition to displays, our ESPRIMO E/P990 PC series, which was designed and manufactured by Fujitsu in Germany, do not consume any power while in standby mode. These PCs have acquired the Blue Angel (Germany) and Nordic Swan (Northern Europe) environmental accreditations, which are the equivalent to Japan's Eco Mark. They are also compliant with the United States ENERGY STAR® 5.0 and EPEAT environmental standards.

In future, as part of our range of initiatives to further improve our energy efficiency, we are working to optimize our standby-mode-zero-watt technologies and are now investigating their possible use with servers.

* Not for sale within Japan.

While zero-watt PCs differ from conventional PCs in terms of their power supply unit, motherboard, and BIOS, they do not represent an entirely new product. However, we had to completely remodel the BIOS and motherboard to achieve zero-watt power consumption. In particular, the circuitry was challenging to design and it took us over a year to complete their development.

Head of the Zero-Watt Development Team,
Peter Bush



By **ICT**

Energy Savings Achieved at the London North Data Center, with Groundbreaking Research

Fujitsu's "London North" data center in the suburbs of London has achieved compliance in line with both local and international legislation, such as the Kyoto Protocol, the European 'Code of Conduct' for data centers and the UK government's 'CRC Energy Efficiency Scheme'. As an energy-saving business and Eco-Friendly Data Center it is actively working to reduce greenhouse gas emissions and mitigate its burden on the environment.

After investigating such elements as best practices and legislation in its field, the London North Data Center was able to successfully save energy by leveraging Fujitsu's management

expertise. For example, a machine room is normally kept at a temperature of between 21 to 22°C, but our research revealed that a temperature increase of 1 or 2°C would have no effect on the machines' performance. Similarly, while humidity had conventionally been kept at about 50%, our studies confirmed that a slight increase or decrease in humidity caused no problems in machine management. Other measures the center introduced included optimizing the floor layout so that air with different temperatures would not mix. Through these efforts, the facility has reduced its yearly CO₂ emissions by about 3,000 tons compared to a conventional data center.



Energy consumption is now a fundamental part of the costs of running a data center, contributing around 30-40% to the total cost. So achieving a sustainable reduction in energy bills is a key driver for our business. However, we felt that there was still plenty of room for improvement in energy usage. To achieve this sustainable reduction, Fujitsu has a clear definition and a methodology for measuring what constitutes an environmentally friendly product or service.

Operations Development Manager
Chris Flanagan



Of ICT

Won the 2009 Minister of the Environment Award for the Prevention of Global Warming, Won Green IT Award 2009 Review Board Special Award.



Blade Server Reducing Power Consumption by about 40%: PRIMERGY BX900

The PRIMERGY BX900 blade server system is designed for dynamically changing IT infrastructures, with superior performance per watt and virtualization capabilities, resulting in a blade server with low power demands and low operating costs. Through the thorough application of low power components and our efforts to improve cooling efficiency, we have been able to reduce electricity consumption by about 40% compared to the Rackmount Server (a Fujitsu product) of four years ago. Moreover, we have not only reduced power consumption but also contributed to reducing the burden on the air conditioning for the entire data center.

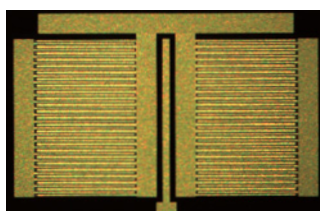


PRIMERGY BX900

Of ICT

Fujitsu Develops World's First Gallium Nitride HEMT for Power Supply

In June 2009, as a technology to reduce power consumption in electronic equipment such as ICT devices and home appliances, Fujitsu Laboratories Ltd. developed a new structure for gallium nitride high electron-mobility transistors (HEMT) that enables power loss to be reduced to one-third (1/3) that of power supplies based on conventional silicon transistors. Fujitsu's new GaN HEMT will be able to reduce total power consumption by 12%, thereby resulting in the effect of removing 330,000 tons of CO₂ in Japan as a whole. In the future, we will continue to push forward toward the practical application of this technology, and intend for it to be in use in power-supply units by around 2011 (see page 49).



Gallium nitride HEMT (surface micrograph)

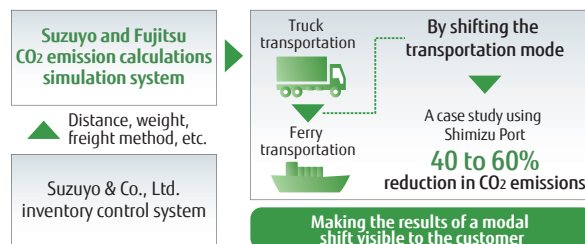
By ICT

Won Green IT Award 2009 Commerce and Information Policy Bureau Director-General Award



Carrying Out CO₂ Reduction Proposal Programs in Cooperation with Suzuyo & Co., Ltd., Via a Modal Shift Simulation

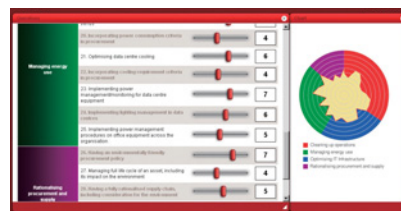
By combining Fujitsu's CO₂ emission calculation system (Logistics package : LOMOS/EC) with Suzuyo's inventory control system, we are able to calculate CO₂ emissions when using modes of transportation other than freight consolidation and trucks (a modal shift). We can then use this information to provide services that clearly identify the modes of transportation that are most environmentally friendly. A feature of this service is that it utilizes a vast range of data—about shipment origin and destination, product weight, and the type of transportation—to calculate CO₂ emissions, and it is supporting our customers' efforts to reduce CO₂ emissions and to draw up their own plans to achieve reductions.



By ICT

An Environmental Consulting Service That Helps Customers Improve Their Own Environmental Management

Centered on Japan and Australia, the Fujitsu Group provides its customers with an environmental consulting service that helps them improve their own environmental management. Fujitsu Australia Ltd., (FAL), a member of the Fujitsu Group, has been developing this environmental consulting service in Australia and providing customers with proposals tailored to their management policies and environmental targets. The service is based on two frameworks: first, the Enterprise Sustainability Framework for environmental change risk evaluation and environmental strategic planning and support; and second, the Green ICT Framework for the evaluation of ICT infrastructure efficiency.



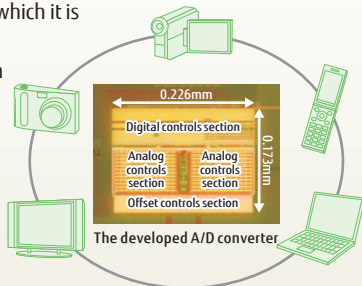
Green ICT evaluation tools (Australia)

Strengthening Our R&D in New Green ICT to Contribute to the Creation of a Low-Carbon Society

Centered on Fujitsu Laboratories Ltd., the Fujitsu Group is carrying out R&D into leading-edge technologies and implementing them. Our goal is to help build the next-generation low-carbon society by contributing to energy and resource savings and to evaluating environmental burdens.

Fujitsu Develops A/D Converter with 1/10th Power Consumption of Previous Models

In February 2010, we completed the development of an A/D (analog to digital) converter with approximately 90% lower power consumption and surface area compared to a conventional device. This miniaturized, low power consumption A/D converter can significantly reduce the power consumption of any device within which it is installed, so we are pushing forward with further research toward its future adoption in a range of devices, such as digital home appliances and mobile phones.



Fujitsu Develops Gallium Nitride HEMT, Which Contributes to a Yearly Reduction in CO₂ Emissions of about 330,000 Tons

In June 2009, we developed a new structure for gallium nitride high electron-mobility transistors (HEMT) so that power loss can be reduced to one-third (1/3) that of power supplies based on conventional silicon transistors. Fujitsu's new GaN HEMT will be able to reduce total power consumption of internet data centers by 12%, thereby resulting in the effect of removing 330,000 tons of CO₂ from Japan as a whole. We are aiming to use it within our own power-supply units by about 2011. (Please refer to page 48.)



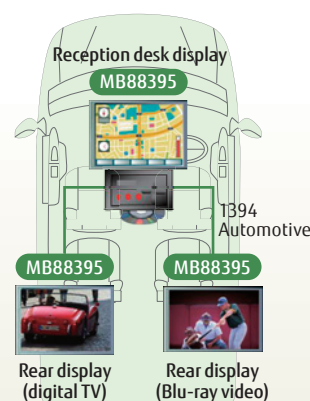
GaN-HEMT chip



Package element

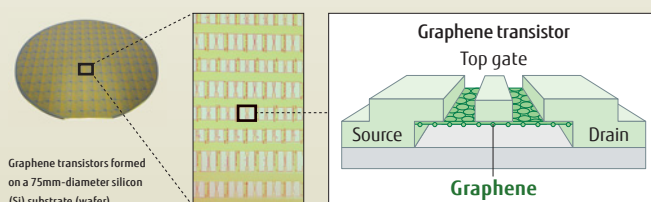
Development of the 1394 Automotive-Standard Compliant LSI, Which Contributes a Yearly 10kg Reduction in CO₂ Emissions

In April 2009, we completed the development of an LSI compliant with 1394 Automotive, the international standard for vehicle information networks. Using this LSI can help reduce the number of wire harnesses within a vehicle by up to 70%, helping to reduce weight and so fuel costs. We estimate that it will reduce annual CO₂ emissions by 10kg in a car traveling 10,000 km a year.

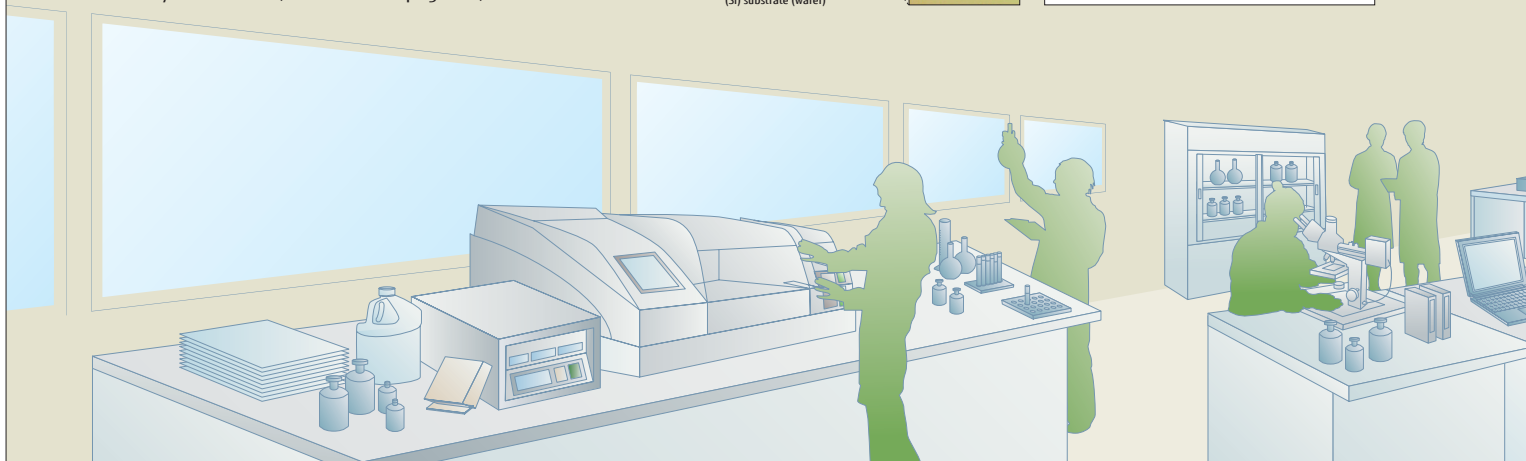


Fujitsu Develops Technology for Next-Generation Low-Voltage, Low-Power Transistors

We developed a novel technology for forming graphene transistors directly on the entire surface of large-scale insulating substrates at low temperatures, as a world first. This technology represents a major step forward for realizing low power consumption LSIs and for reducing power consumption in the ICT devices that adopt them.



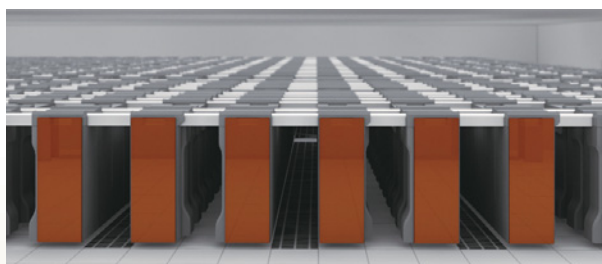
Graphene transistors formed on a 75mm-diameter silicon (Si) substrate (wafer)



Participation in Japan's Next-Generation Supercomputer Project

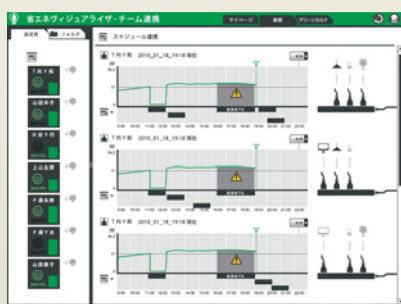
It is hoped that supercomputers will contribute significantly to developments in fields such as energy, science and technology, and medical treatment, as they are able to carry out the enormous and incredibly complex calculations required for tasks such as global warming forecasts and the development of next-generation energy sources.

Fujitsu has been participating in Japan's Next-Generation Supercomputer project—being sponsored by the Ministry of Education, Culture, Sports, Science and Technology—since fiscal 2006. Working together with Riken, we are pushing forward with this project and aiming to complete development of the Next- Generation Supercomputer by 2012.

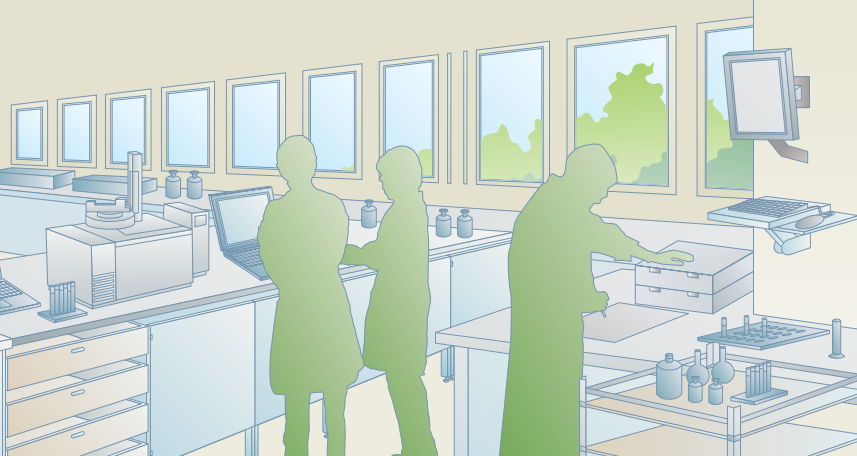


Making Visible Power Consumption in the Office and Developing a 'Smart' Power Strip to Raise Awareness about Energy Saving

In March 2010, we developed our smart power strip, which features the smallest power strip with built-in power sensor in the industry. It enables power consumption to be visible on a per-outlet basis and also helps to raise user awareness about energy saving by indicating when they forget to turn their computers off. The product was tested in some of our offices and they achieved a 20% reduction in power consumption below their previous levels.

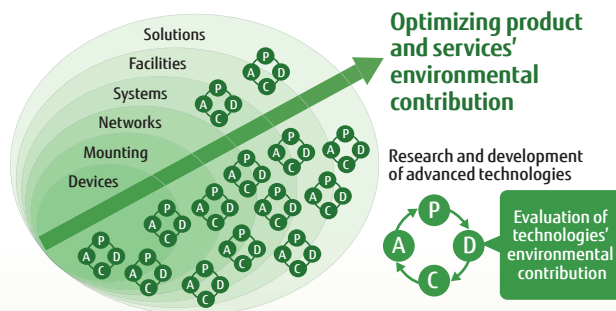


An illustration of how the system makes office power consumption visible



Evaluating CO₂ Reduction Potential from R&D to Use Stages

For all leading-edge technologies under development in our laboratories, Fujitsu Laboratories Ltd., began in April 2010 to evaluate the potential reduction in CO₂ emissions from using products and services that incorporate these technologies. Through these efforts, Fujitsu is broadly promoting designs optimized for their benefits to the environment, both in products and services incorporating each technology as well as in the systems that deploy them, including operations management.



Demonstration of an 'Outpatient Guidance Solution' for Medical Facilities Using Low-Power Electronic Paper

In July 2009, we began demonstrating at Fujitsu Hospital some of our recently developed medical technologies, such as a solution to synchronize an electronic card holder with an electronic medical record system and to an outpatient navigation system, which guides patients to their treatment room and lets them know their place in the queue when waiting for their consultation. By installing low-power electronic paper in an electronic card holder, we are able to reduce power consumption to less than one tenth that of PHS devices and other hand-held terminals.

