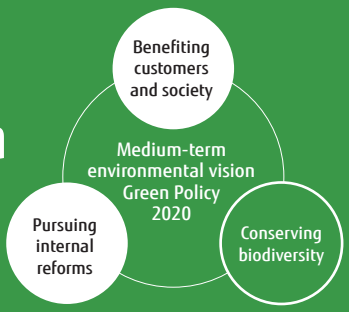
Highlights in 2010

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



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

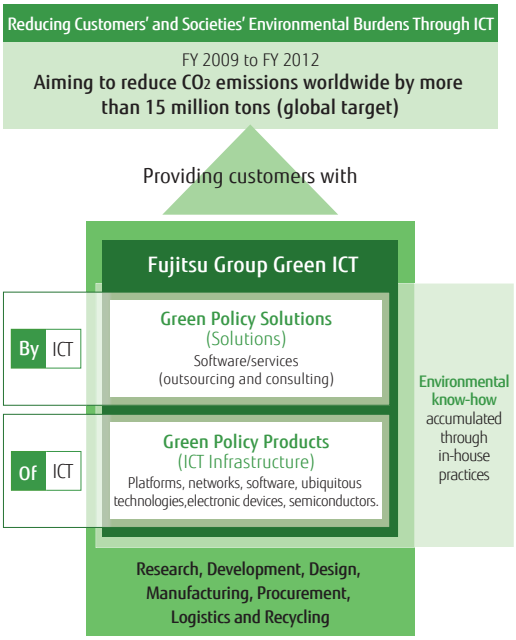
Green Policy Innovation

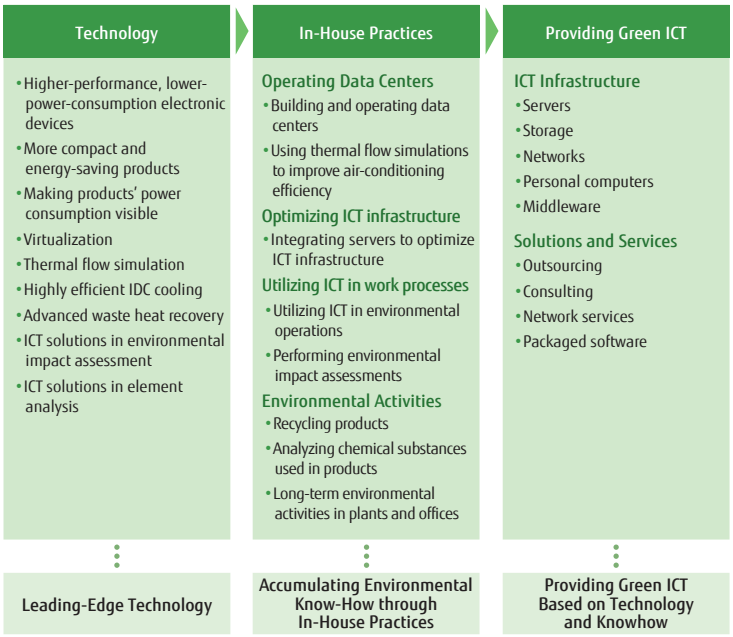
Our Global Target: Reduce CO_2 Emissions by More than a Cumulative 15 Million Tons over Four Years

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

As a global ICT enterprise group, Fujitsu has set a global target to make a significant contribution to cutting the emission of greenhouse gases. This calls for reducing CO_2 emissions by more than a cumulative 15 million tons over the four-year period from FY 2009 to FY 2012. The whole Fujitsu Group is actively engaged in achieving this target.

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





In-House Implementation of Advanced Green ICT

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

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

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

Environmental Management Dashboard and Power Dashboard

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

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

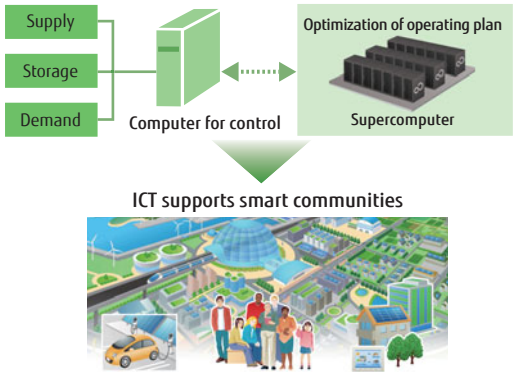
A Typical Environmental Management Dashboard Display

A Typical Power Dashboard Display

Optimizing Natural Energy Usage

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

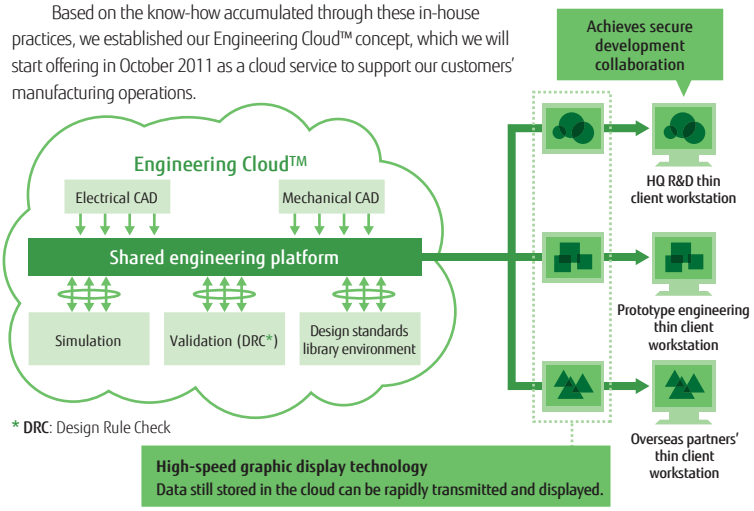
Solar panels installed at our Kawasaki Plant



Using the Cloud in Manufacturing (Engineering Cloud™)

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

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



* DRC: Design Rule Check

TOPICS Numazu Software Development Cloud Center

Between FY 2008 and FY 2010, this center used our own products to bring together six separated domestic facilities for the development environment, forming a cloud-based concentration of the servers. Through this process, it reduced the number of servers from about 1,800 to about 1,000, achieving a cumulative reduction in CO_2 emissions of 2,660 tons over the three years. In future, this know-how of concentrating servers and creating a cloud environment will contribute to a wide range of reductions in environmental burdens of our own and our customers'.

We are also making power consumption visible, so that the amount used by individual ICT equipment can be identified, switching off storage devices by the linkage to servers, and measuring the temperatures of air at the inlets and outlets of servers so that local hot spots and cold spots can be reduced to raise the efficiency of air conditioning. These measures, among others, will reduce our CO_2 footprint by 1,036 tons in FY 2011, and we remain committed to further reductions.

An inspection tour course of the Numazu Software Development Cloud Center

Highlights in 2010 Green Policy Innovation: Working With Customers to Create a Prosperous Low-Carbon Society

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

Japan Advanced Institute of Science and Technology (JAIST) in Hokuriku Up to 151.5 Tons of CO_2 Reduction per Year

Working to Increase the Efficiency of Server Utilization

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

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

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

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

Integration and Virtualization to Increase Server Utilization Efficiency, Cut CO_2

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

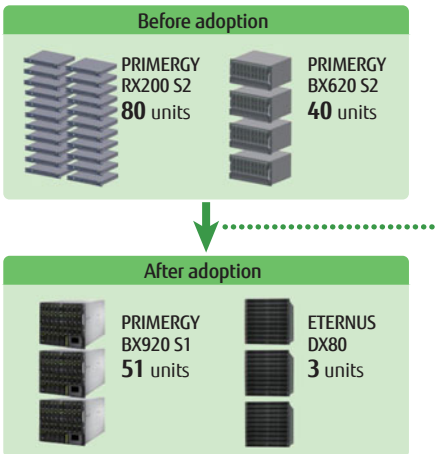
This private cloud integrated and virtualized the former about 120 servers in only 51 physical servers, enabling a dramatic increase in usage efficiency. Air-conditioning efficiency was also increased by ducting cooled air directly into the server racks and optimizing the arrangement of racks.

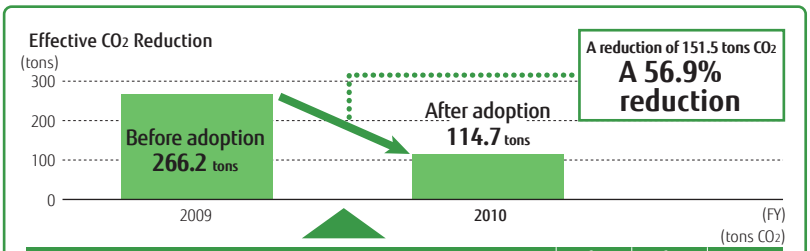
Validation of the environmental efficiency of this system revealed that its introduction reduced electrical power and space to save up to 151.5 tons of CO_2 per year, a reduction of 56.9%.

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

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

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





Factors	Before Adoption	After Adoption	Amount Reduced
Space required for ICT equipment Burden of facilities (air-conditioning, etc., other than ICT power consumption)	158.1	62.0	**96.1**
ICT NW power consumption ICT /Network equipment power consumption	105.4	51.7	**53.7**
Operating space Energy required for maintenance, operation and management work	2.7	1.0	**1.7**

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

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

Stakeholder's Voice

Taking up the Challenge of System Efficiency Improvements

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

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

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

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

A Word from Fujitsu

Partnering with JAIST; Always Aiming for Leading-Edge Technology

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

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