Fujitsu Group Environmental Report 2014

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Promoting Environmentally Conscious Datacenters

Our Approach

With the spread of cloud computing, energy use by datacenters is on an upward trend and society is showing more concern over the environmental performance of datacenters. Also, electricity costs are increasing with rising electric utility rates. Datacenters comprised 27% of FY 2012 CO_2 emissions in the Fujitsu Group, with emission rates increasing 8.1% over the three years from FY 2010–12 at our 19 main datacenters in Japan. Furthermore, our datacenter CO_2 emissions are expected to continue to rise as our cloud business grows, making environmentally conscious datacenters a social responsibility for the Group, as well as a critical theme to address in strengthening our business foundation over the long term.

In the Fujitsu Group, we are targeting* approximately 80% of our datacenters (based on server room floor space) and we are working to boost environmental performance.

* Activity targets: Global datacenters 1,000 m² or larger, in principle, or specific datacenters requested by datacenter business units.

Summary of FY 2013 Achievements

Targets under the Fujitsu Group Environmental Action Plan (Stage VII) (toward FY 2015)	Improve **environmental performance** of our major datacenters.
FY 2013 Key Performance	Established the Green Datacenter (GDC) Committee. Set internal targets (common and individual targets).

FY 2013 Performance and Results

Established the Green Datacenter (GDC) Committee

We established the Green Datacenter (GDC) Committee and set an action policy toward implementing the Fujitsu Group Environmental Action Plan (Stage VII). We established the GDC Working Group (GDCWG), which plans and implements activities under the GDC Committee, and the Domestic and Overseas Sub-Working Groups (SWGs), while proceeding with activities that have produced the target results.
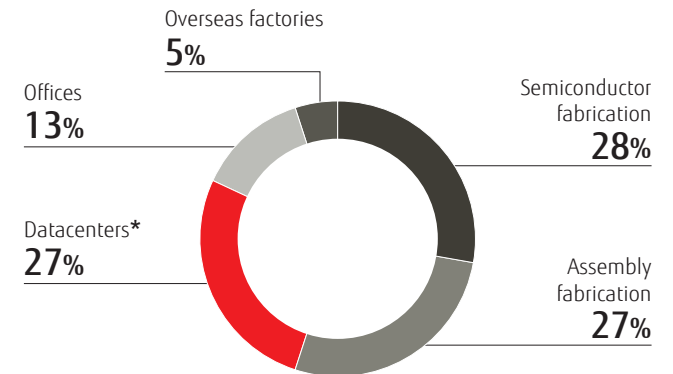
Activity Flow of GDC Committee
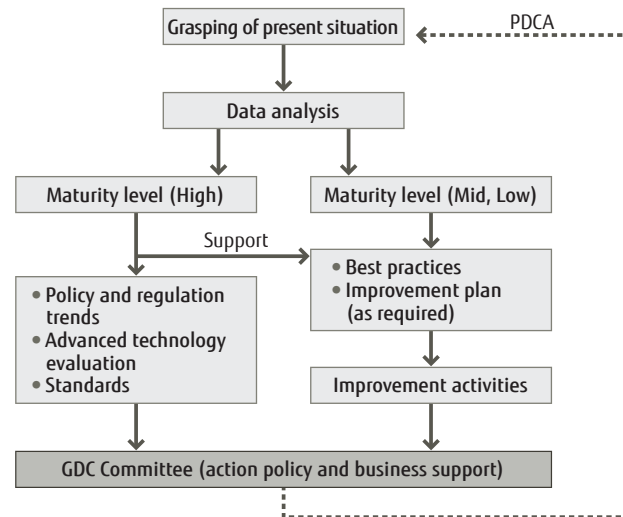
Setting Internal Objectives

We set internal objectives, consisting of common and individual objective items, for the target datacenters. For the common objectives, we used internationally recognized datacenter energy indices (PUE, etc.) and set targets for improvement rates. For the individual objectives, each site selected indices individually and decided to measure these indices regularly.

Percentages of CO₂ Emitted by Various Businesses (FY 2012)

Overseas factories 5%
Offices 13%
Datacenters* 27%
Semiconductor fabrication 28%
Assembly fabrication 27%

* "Datacenters" indicate 47 datacenters in Japan and overseas (19 in Japan, 28 in overseas)

FY 2014 Targets and Plans

Promote the achievement of internal targets

First, with regard to common targets, along with assessing the level of progress since the benchmark year, FY 2012, we plan to adopt outside-air cooling, "visualize" air-conditioning temperatures and energy, improve full usage of rack space, increase air-conditioning temperatures, and implement hot/cold air separation. Additionally, with regard to individual targets, we plan to set guidelines for promoting policies suited to the characteristics of each datacenter, and work on improvement activities in line with those guidelines.

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Reducing Greenhouse Gases (GHG) Emissions and Boosting Energy Intensity at Our Business Sites | Promoting Environmentally Conscious Datacenters | Reduce CO₂ Emissions from Logistics and Transportation | Promoting CO₂ Emission Reductions with Our Business Partners | Increasing Amounts of Renewable Energy Used | Efficient Use of Water Resources | Reducing Chemical Substances Emissions | Limiting Amounts of Waste Generated | Product Recycling

Main Activities of FY 2013

Open New Facilities at the Akashi System Center, Making it an Environmentally Conscious Datacenter Using Outside-air

At the Akashi System Center, our main datacenter in Western Japan, we opened two new modular datacenters (a seismic isolation datacenter and an earthquake-resistant datacenter). Along with adopting high efficiency equipment and a server room layout that was designed using thermodynamic simulations, these new facilities utilize Fujitsu's existing environmentally conscious datacenter expertise, while being our first facilities to use outside-air for the primary air-conditioning.

Outside-air is used for cooling during winter, intermediate seasons, and as much as possible in summer, while electric cooling is only used to supplement the outside-air, maximizing air-conditioning efficiency. In addition, we have developed and adopted new cooling technology (patent pending) that combines packaged air-conditioners (PAC) for general use computing rooms as supplemental cooling equipment in summer to make cooling with outside-air possible throughout the year, even in warm climates.

Exterior view of the Akashi System Center

New facility (seismic isolation datacenter)

This technology can be easily deployed regardless of the datacenter's scale or building's specification, promising to improve the energy efficiency of existing datacenters.

In the new facilities of the Akashi System Center, our design goal is a PUE value of less than 1.2 at times of full operation.

Contributing to Verification Projects for Using Datacenter Waste Heat to Achieve Exceptional Reductions in CO₂ Emissions

Fujitsu is pushing forward environmental consciousness in existing datacenters and participating in the Keihanna (Kyoto) Datacenter Verification Tests of the Ministry of the Environment's FY 2013 project for developing and demonstrating technologies for reducing CO_2 emission. This project emphasizes the reuse of datacenter waste heat, aiming for exceptional reductions in CO_2 emissions.

Since it is crucial to raise the temperature of waste heat as much as possible in order to increase the efficiency of its utilization, servers that can operate safely in high heat environment are necessary. Fujitsu provided the datacenter with 154 of its FUJITSU Server PRIMERGY RX200 S7 servers, which can operate in 40°C environment. The servers have been operated one side only to create a concentrated, high heat environment. Moreover, power conversions were cut to one third of normal levels due to the PRIMERGY RX200 S7's use of DC (direct current) power. This made it possible to boost the power usage effectiveness rate (thermal conversion efficiency) to 90%, as opposed to the existing rate of 70-80%.

At the Keihanna Datacenter, they realized a 30% cut in power consumption in FY 2013, aiming for a final overall reduction of 70%. Along with actively contributing to this project going forward, Fujitsu will further promote environmental consciousness at our existing datacenters.

A Message from a Joint Collaborator in Verification Projects at the Keihanna Datacenter

Current datacenters are mainly built with an enclosed, vertically integrated system structure. Since the datacenters themselves have a system design comprised of combinations of multiple devices, reducing power consumption for ICT equipment only (such as servers, etc.), or for air-conditioning only, does not optimize energy savings for the entire datacenter.

In order to solve this, we are bringing together experts in each layer or component of the datacenters, such as air-conditioning, servers, datacenter management, etc., and are working to achieve efficiency for the overall system.

Osaka University Cybermedia Center
Professor Morito Matsuoka
(right)

(Left: Hideaki Fujimaki, Product Marketing Unit, Fujitsu Limited