

# Energy-saving Measures (Global Warming Prevention)

## Various measures by the Fujitsu Group to combat global warming by reducing energy consumption

### Policy

The reduction of energy and fuel consumption by plants and other sites is being promoted to preserve energy resources and restrain CO<sub>2</sub> generation. The Fujitsu Group formerly targeted reduced energy consumption per unit of sales, but we have set new targets for curbing emissions (absolute volume) of CO<sub>2</sub> and other greenhouse gases and are working to achieve them. We are reinforcing activities considering global warming prevention in every aspect of our business operations.

### Fujitsu Group Environmental Protection Program (Stage IV) targets

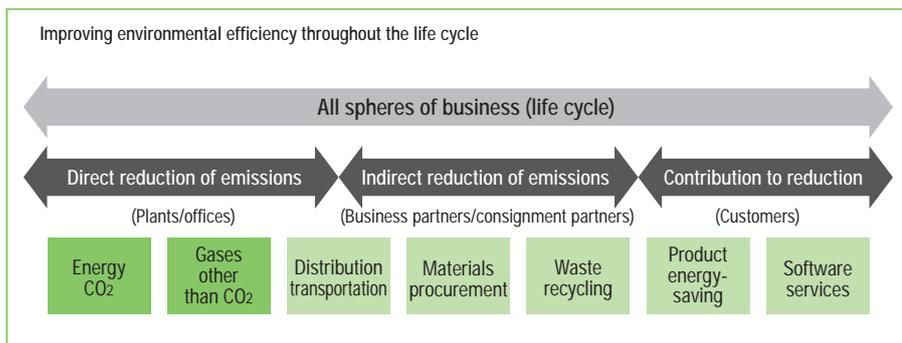
**Aim at increasing the environmental efficiency throughout lifecycles.**

To reduce the carbon dioxide emission resulted from energy consumption down to or below its actual emission of fiscal 1990 by the end of fiscal 2010.

To reduce greenhouse gases other than carbon dioxide by 10% from their actual emission of fiscal 1995 by the end of fiscal 2010.

To contribute to the reduction of greenhouse gases by efficient physical distribution, product recycling, development of energy saving products.

### Structure



### Global Warming Prevention Measures Strategic Committee

We established the new Global Warming Prevention Measures Strategic Committee to reinforce global warming measures in every sphere of business. We have set reduction targets for fiscal 2010 for direct emissions of greenhouse gases from plants, sites and offices. We also strive to improve environmental efficiency throughout the life cycle by grasping and evaluating CO<sub>2</sub> emissions as part of our efforts to reduce indirect emissions through environmental burden reduction activities, and to contribute to reduction by customers through provision of eco-friendly products and solutions.

### Results

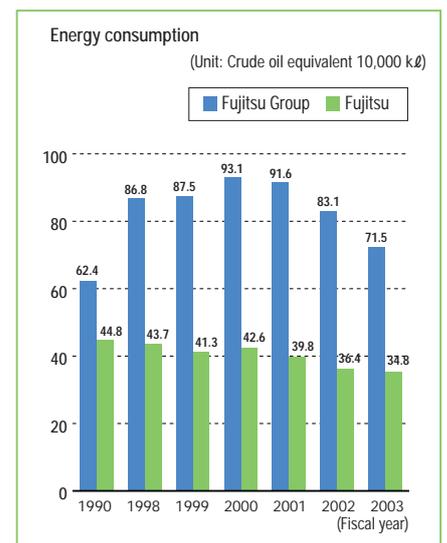
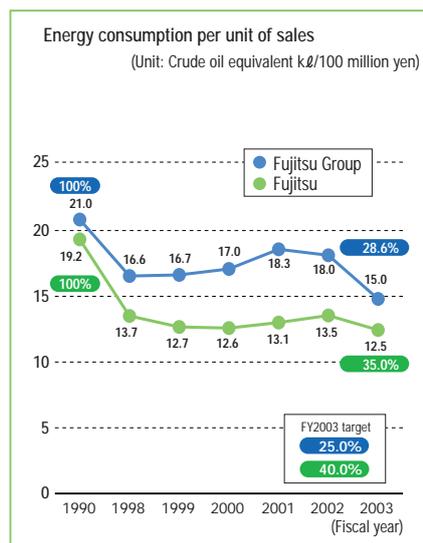
### Fujitsu Environmental Protection Program (Stage III) target

- Sales-based energy consumption per unit to be cut 25% by the Group and 40% by Fujitsu by the end of fiscal 2003 based on fiscal 1990 results

### Results for energy-saving targets of Fujitsu Environmental Protection Program (Stage III)

In fiscal 2003, the final year of this stage, the Fujitsu Group's energy consumption measured 15.0 kℓ per 100 million yen crude oil equivalent, a 28.6% reduction relative to fiscal 1990, which means the target was achieved. The corresponding figures for Fujitsu were 12.5 kℓ per 100 million yen crude oil equivalent, or a 35.0% reduction, which means the target was not achieved. The absolute volume of energy consumption has been reduced since fiscal 2001, however.

- Group scope: Fujitsu (22 own plants/sites), 25 domestic manufacturing companies, 10 overseas manufacturing companies
- Targeted energy: Total of electricity, oil and gas consumed by plants/sites (crude oil equivalent kℓ)
- \* The crude oil equivalent for overseas is assumed in the coefficient for Japan.

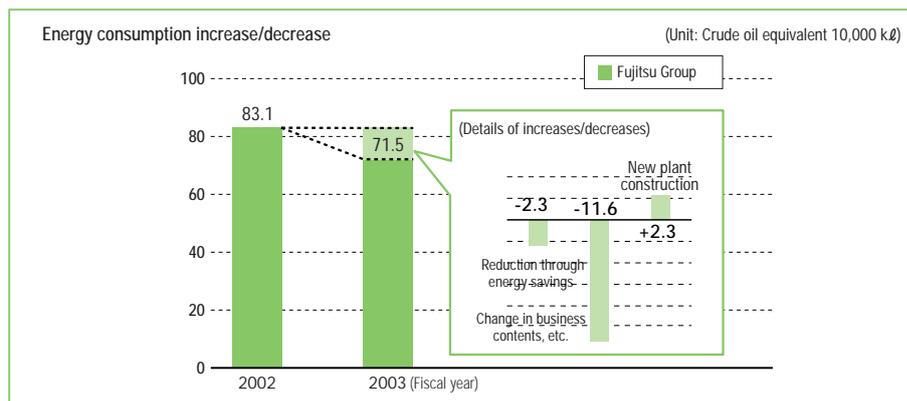


## Contents of activities/analysis for fiscal 2003

The Fujitsu Group's energy consumption measured 715,000 kℓ, a 14.0% (116,000 kℓ) reduction relative to the previous fiscal year. Factors contributing to this dramatic decrease included the transfer of manufacturing companies outside the Fujitsu Group under a business reorganization conducted in recent years. Under these circumstances, we achieved an approximately 23,000 kℓ reduction through continuous energy-saving activities as follows:

- Energy-saving measures concerning equipment with a focus on motor facilities (introduction of free-cooling, inverter, energy-saving equipment)
- Reexamination of manufacturing processes and efficiency

- enhancement, accompanied by proper motor facility operation and improved management
- Proper setting of office air-conditioning temperatures, energy-saving use of lighting and OA machines



## Case Studies

These examples show some of the latest energy-saving measures implemented at plants and sites.

### Various energy-saving measures at a semiconductor plant

We implemented energy-saving measures for various equipment in a semiconductor manufacturing plant with high energy consumption.

The Aizuwakamatsu Plant employed free cooling, for example, using cold outside air in winter to reduce the energy consumed in cooling water for manufacturing equipment. The Iwate Plant and Akiruno Technology Center installed inverters for cooling water circulating pumps and air exhaust fans to control the revolutions according to changes in the burden. The Iwate Plant also replaced a large boiler with several small boilers and introduced control of the number operating according to burden change. The Mie Plant upgraded to a highly energy-efficient turbo refrigeration machine.



A pump inverter at the Iwate Plant



Small through-flow boilers at the Iwate Plant

### Energy-saving design from the construction stage onward

(Kochi Fujitsu Technoport)

Established in August 2003, Kochi Fujitsu Technoport pursues eco-friendly design, including energy-saving design employed in its construction.

This site, an Internet data center (IDC), introduced redox-flow batteries\* with a lower environmental burden as emergency batteries. These replace conventional self-power generation for emergencies and contribute further to CO<sub>2</sub> emissions reduction by making use of nighttime electricity. Other energy-saving measures included use of lighting with solar and wind generators for the parking lot, human-detecting sensors for automatic illumination adjustment of room lighting and ventilation fan ON/OFF control, and an individual air-conditioning system for specific operation.

Environmental considerations extend to every corner of the site, including the use of rainwater transparency asphalt and recycled construction materials, furniture and fixtures.

\* Redox-flow batteries: Rechargeable power storage batteries employing a vanadium solution for the electrolysis liquid of the positive/negative poles, made by Sumitomo Electric Industries, Ltd.



Kochi Fujitsu Technoport

## Measures to reduce greenhouse gases

### Results for energy CO<sub>2</sub> emissions volumes

The approximate total fiscal 2003 CO<sub>2</sub> emissions volume from energy consumption was 1,292,000 tons-CO<sub>2</sub> for the Fujitsu Group (down 16.0% from fiscal 2002) and 601,000 tons-CO<sub>2</sub> for Fujitsu (down 6.4% from fiscal 2002). The total volume has increased since fiscal 1999 for the Group, especially, due to business expansion, but we have set new CO<sub>2</sub> emissions volume targets in the Fujitsu Group Environmental Protection Program (Stage IV) and are pursuing reduction activities.

\* Because we reexamined the emission coefficient in calculating the CO<sub>2</sub> emissions volume, values disclosed before have been changed. Japanese coefficients are substituted for CO<sub>2</sub> emissions volumes at overseas companies.

#### CO<sub>2</sub> emissions through energy consumption

(Unit: 10,000 tons-CO<sub>2</sub>)

	1990	2000	2001	2002	2003
Fujitsu Group	108.3	161.1	159.0	153.8	129.2
Fujitsu	78.9	71.9	66.8	64.2	60.1

### Measures to reduce greenhouse gases other than CO<sub>2</sub>

Every company in the semiconductor industry has created an independent action plan to cut emissions of such greenhouse gases as perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF<sub>6</sub>). Fujitsu, led by the Electronic Devices Division, has developed an in-house emissions control plan in conformity with industry action plans. We are continuously pursuing such activities as conversion to gases with a lower greenhouse coefficient and installation of specialized equipment on new production lines. Emissions related to semiconductor processing amounted to appropriately 455,000 tons in fiscal 2003.

#### Emission volume of greenhouse gases other than CO<sub>2</sub>

(Unit: 10,000 tons-GWP)

	1995	2000	2001	2002	2003
Fujitsu Group (Electronic Devices Division)	25.9	57.7	54.4	56.4	45.5