Stop Global Warming

Fuji Electric provides products and services that contribute to the creation and conservation of energy. We also strive to conserve energy at our plants and other operational sites. In this manner, we are promoting the reduction of CO_2 emissions on a global scale and helping to stop global warming.

Reducing Greenhouse Gases

Action Plan to Reduce CO_2 Emissions

With regard to the reduction targets of the Kyoto Protocol Commitment Period (FY2008–2012), Fuji Electric participated in the voluntary action plan for the industry designed by four electric/electronics industry organizations (see Note), thereby contributing to a reduction of CO_2 emissions.

In March 2012, Fuji Electric participated in the new Low Carbon Society Action Plan initiative drawn up by the four electric/electronics industry organizations for fiscal 2013 onward and looking ahead to fiscal 2020. Fuji Electric reported on its contribution to CO_2 emission reduction through its provision of geothermal and photovoltaic power generation and highly efficient coal-fired power generation. Following the verdict on the industry method for calculating the amount of contribution, the plan is to change the method of calculation with regard to the amount of society's CO_2 emission reductions through products in fiscal 2012.

Note: The Japan Electronics and Information Technology Industries Association (JEITA); the Communications and Information Network Association of Japan (CIAJ); the Japan Business Machine and Information System Industries Association (JBMIA); and the Japan Electrical Manufacturers' Association (JEMA)

Fiscal 2011 CO_2 Emission Reduction Targets and Achievements

In fiscal 2011, we implemented a far-reaching electricity saving response in the aftermath of the Great East Japan Earthquake.

The main initiatives taken by the Company included the introduction of high-efficiency equipment (inverter systems, lighting, and air conditioning) as well as a production night shift. At the same time, we installed private power generation facilities, implemented the utilization of emergency generators, added extra days to the summer closure and extended the “Cool Biz” period, an initiative advocated by Japan's Ministry of Environment as a means to reduce electric consumption by limiting the use of air conditioning during summer. In addition, we introduced an integrated monitoring system to monitor, in real time, the electric power used at all the power plants under Tokyo Electric Power's jurisdiction, collaborated on efforts to reduce peak power, and ensured our support for laws restricting power utilization.

As a result of these initiatives, we achieved our fiscal 2011 goals for reducing CO_2 emissions, cutting them in Japan to 155,650 tons, down 30.5% from fiscal 2006, and also achieved the fiscal 2011 goal of our Medium-Term Environmental Management Plan (FY2009–2011), namely a reduction of 29% compared with fiscal 2006.

We conducted audits of energy savings at two of our overseas bases, Fuji Electric Shenzhen Co., Ltd. and Fuji Electric Semiconductor (Malaysia) Sdn. Bhd., launching our overseas CO_2 emission reduction activities.

CO_2 emissions and CO_2 emissions per Unit of Sales in Japan

Notes:
1. This data covers the production bases and offices of all domestic consolidated subsidiaries, including Fuji Electric's offices.
2. Per unit sales figures are calculated as CO_2 emissions over consolidated net sales
3. Emission estimates use the emissions coefficient for electric power users (336 tons of CO_2 per million kilowatt-hours in fiscal 2011), taking into account the goal of a 20% emissions cut relative to 1990 levels by 2010, as specified by the Federation of Electric Power Companies of Japan

Overseas CO_2 emissions Volumes per Unit of Sales

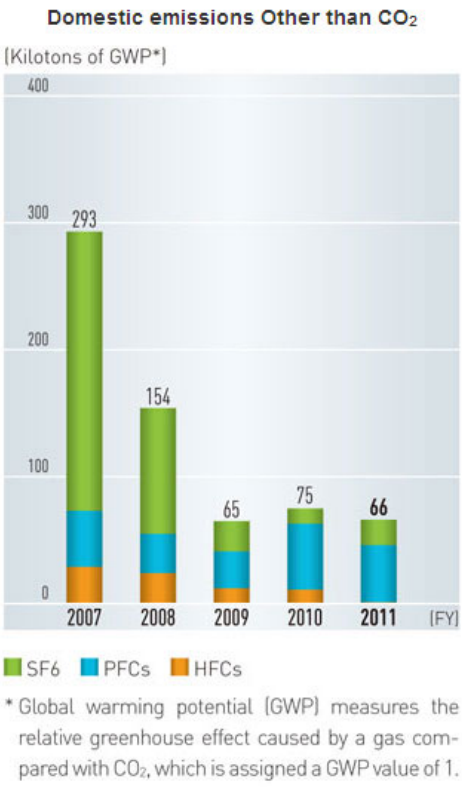
Notes:
1. Overseas energy and electric power conversion coefficients obtained from the JEMA website (Ver. 3, March 2006).
2. CO_2 emissions per unit refer to units of sales, with fiscal 2006 = 100.

Reducing Greenhouse Gases other than CO2 including SF6

There are six broad types of gases including CO2 and various alternatives for chlorofluorocarbon that all induce the greenhouse effect.

Fuji Electric completed the shift to alternative gases in the semiconductor segment, where emissions of greenhouse gases were relatively large, in fiscal 2009. As a result, the Company was successful in reducing its amount of emissions to less than 10% of the level recorded in fiscal 1995, the base year under the Kyoto Protocol Treaty. Moreover, Fuji Electric maintained its amount of emissions in fiscal 2011 to the level recorded in fiscal 2009.

In addition to promoting reduction activities throughout its production processes, the Company is advancing the development of greenhouse gas alternative technologies for use in products. In fiscal 2011, Fuji Electric launched Japan’s first vending machines that use a new-type of low-GWP coolant instead of existing HFC coolants.



Reducing CO_2 Emission through Our Products

Eco-Product Certification Standards

Fuji Electric evaluates product environment-friendliness against its own standards. Products meeting fixed standards throughout society are designated “eco-products,” and of these, products which are tops in the industry in environmental performance and degree of environmental contribution or have otherwise received commendations from outside the Company are designated “super eco-products.”

Formulated to serve as a signpost for Fuji Electric's medium- to long-term environmental activities, Environmental Vision 2020 sets society's overall CO_2 emissions reduction target at 2.4 million tons by 2020 and calls for the provision of both eco-friendly and environmental contribution products to help meet that target. It also calls for sales of eco-products to make up 70% of total net sales by the same year.

Eco-Product Definitions	
Eco-Friendly Products	Products that show that thought has been put into reducing impact on the environment throughout their life cycles, from the raw materials used and parts procurement to their manufacture, distribution, use and recycling. These include the uninterruptible power system (UPS), vending machines and insulated-gate bipolar transistor (IGBT) modules.
Environmental Contribution Products	Products that contribute to environmental protection through their use. These include geothermal power generation systems, energy monitoring units and inverters.

Promoting Eco-Products

In fiscal 2011, we newly registered six super-eco products, including the geothermal power generation system that was selected for the highest JEMA technical achievement award.

We exceeded our fiscal 2011 eco-product to total net sales ratio target of 40%, achieving 40.9% (FY2010: 32.1%). Against the CO_2 emissions volume reduction target from products sold during fiscal 2011 of 1.05 million tons, we achieved 1.87 million tons.

For fiscal 2012, we have set an eco-products sales ratio target of 45% as we continue to work to create eco-products and increase the CO_2 reduction effect.

Products that Reduce CO_2 emissions

Fuji Electric has established Eco-product Certification Standards for products that contribute to society-wide reductions in environmental impact.
Here, we will introduce some of Fuji Electric's eco-products that help prevent global warming by reducing CO_2 emissions.

Power Plants

Geothermal Power Generation Facilities

Geothermal power is energy generated using the geothermal steam created by subterranean magma. As geothermal power generation does not require the burning of oil or coal, CO_2 emissions are substantially lower than those from thermal power generation. Furthermore, this power source is able to provide supplies of electricity that are more stable than other renewable energy sources.

CO_2 emissions reduction: approx. 378,000 tons / year

(Compared to thermal power generation)
Effect calculated under typical operating conditions (when product in use)
Geothermal steam turbine: output 117MW, utilization rate 90%
CO_2 emission factor 0.410kg-CO_2/kWh

Wayang Windu Geothermal Power Station in Indonesia

Factories

Inverters

Inverters are used in a wide variety of equipment, including elevators, building air conditioning systems, and factory manufacturing facilities. By optimally controlling the rotation speed of the motors that move such equipment, inverters eliminate energy loss during operation and contribute to energy savings.

CO_2 emissions reduction: approx. 10.3 tons / year (50.2% reduction)

(Compared to damper control)
Effect calculated under typical operating conditions (when product in use)
Operating conditions: Motor output 15kW, air flow 85% (operation 2,000 hours), air flow 60% (operation 2,000 hours)
Damper control: Air flow 85% (load 91%), air flow 60% (load 76%)
Inverter control: Air flow 85% (load 61%), air flow 60% (load 22%)
CO_2 emission factor 0.410kg-CO_2/kWh

Data Centers

Local Air Conditioning Systems

Data centers consume extraordinary amounts of electricity. Fuji Electric's local air conditioning systems help identify localized heat accumulations to provide efficient cooling for these facilities.

CO_2 emissions reduction: approx. 294 tons / year (51.5% reduction)

(Compared to underfloor air conditioning systems)
Effect calculated under typical operating conditions (when product in use)
Operating conditions: Hours of operation/year 8,760 hours, assumed load an average of 5kW/unit when racks number 200 units
CO_2 emission factor 0.410kg-CO_2/kWh

Office Buildings

UPSs

Office Buildings

Equipped with batteries, UPSs protect computers and factory equipment from power outages. We have created UPSs that realize world-leading levels of power conversion efficiency at 98.5%, thus contributing to energy savings.

CO_2 emissions reduction: approx. 103 tons / year (82.4% reduction)

(Comparison between models released in fiscal 2006 and those released in fiscal 2011)
Effect calculated under typical operating conditions (when product in use)
Operating conditions: Hours of operation/year 8,760 hours, 515kVA, power factor 0.9, load factor 80%
Conventional product: FY2006 7000D standard inverter power supply, efficiency 95%
Current product: FY2011 dual-processing 8000ND Series, efficiency 98.5%
CO_2 emission factor 0.410kg-CO_2/kWh

Automobiles

IGBT

IGBT modules are a type of power semiconductor. They are used in inverters, EVs, and the power conversion equipment of wind and solar power generation facilities, and are essential to realizing energy savings.

CO_2 emissions reduction: approx. 75 kg / year (13.0% reduction)

(Comparison between models released in fiscal 1998 and those released in fiscal 2007)
Effect calculated under typical operating conditions (when product in use)
Operating conditions: 22kW inverter model conditions, hours of operation/year 2,920 hours
Conventional product: FY1998 S Series
Current product: FY2007 V Series
CO_2 emission factor 0.410kg-CO_2/kWh

Stores

Building Energy Management Systems

Building energy management systems are used to monitor and efficiently control energy usage in stores and other buildings. By employing combinations of renewable energy systems and storage batteries, these management systems help equalize electric power loads.

CO_2 emissions reduction: approx. 20 tons / year (8.1% reduction)

(Benefit from introducing Fuji Electric's building energy management systems)
・Current status: Introducing electric power monitoring system, taking measurements and conducting survey of waste from operational aspect
・Measures: Monitoring of PC operations during lunch breaks, reduction to standby power at night
・Measures firmly entrenched: E-mail sent out asking for reasons why PCs were used at lunchtime, responses collated and corrective action taken
・Effect: CO_2 emissions reduced 8.1%, lunchtime PC users reduced by half, nighttime standby power reduced by two-thirds

Vending Machines	
Fuji Electric's vending machines employ heat pump technologies, non fluorocarbon refrigerants, and state-of-the-art vacuum insulation panels. By combining these features with light-emitting diode (LED) displays, we have created ultra-energy-efficient vending machines that realize substantial reductions in electricity consumption. **CO_2 emissions reduction: approx. 332 kg / year (49.4% reduction)** (Comparison between models released in fiscal 2006 and those released in fiscal 2012) Effect calculated under typical operating conditions (when product in use) Operating conditions: In accordance with vending machine test method JIS B 8561:2007 CO_2 emission factor 0.410kg-CO_2/kWh	

Energy Conservation Initiatives in Logistics

To reduce CO_2 emissions in logistics, shippers are required to measure and improve their energy consumption.

Fuji Electric developed Guidelines on Shipper Obligations to facilitate a smooth and appropriate response by operating companies and sites to legislation that came into force in April 2006 in Japan. It is also striving to enhance understanding of and to publicize the measurement range and computational procedures for CO_2 emissions, methods of reporting, roles of key personnel and other factors. In order to ascertain the environmental impact of logistics activities, we have implemented the FeSMART* environmental management support system for centralized data management.

In addition, Fuji Retail Systems, which manufactures vending machines and other such products, has been designated a specified shipper by the Ministry of Economy, Trade and Industry, and is continuing to reinforce its energy conservation activities.

* FeSMART（Fuji electric Sustainable MAnagement suppoRT system) Enables registration of and access to all environmental data relating to the Company's factories and operating sites using a web browser on the Company's Intranet

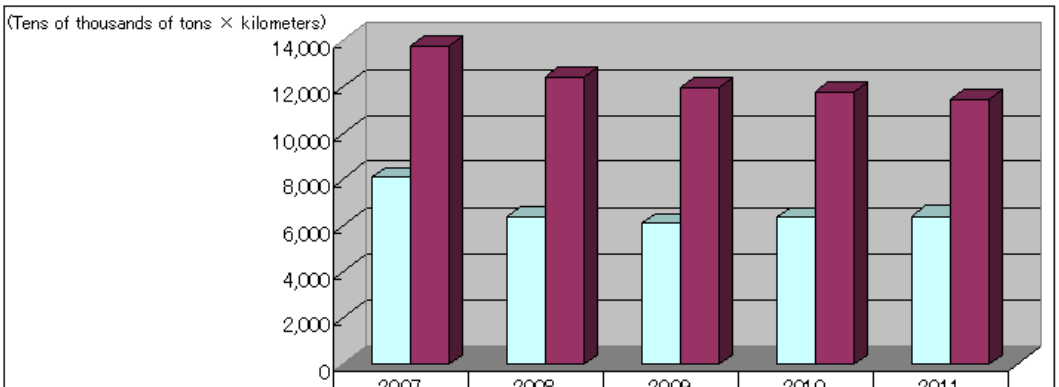
Reduction of CO_2 Emissions on “Milk Run”

At the Suzuka Factory in Japan, we are focusing on reducing CO_2 emissions during parts transportation.

One area involved looking at the so-called milk run. First introduced in fiscal 2010, this is a method by which parts from several suppliers are collected using one large truck.

Previously deliveries along this route entailed several trucks making roundtrips between the Company's factory and one of the six component manufacturers. Now, one large truck is driven around all six companies to collect parts. This has resulted in an annual CO_2 emission reduction of 4.5 tons.

Environmental Impact of Logistics (In Japan)



	2007	2008	2009	2010	2011
Impact of logistics (Tens of thousands of tons × kilometers)	8,087	6,387	6,089	6,336	6,424
CO2 Emission Volume (Tons of CO2)	13,750	12,398	11,977	11,772	11,475