

Stop Global Warming

Fuji Electric is promoting the reduction of CO₂ emissions on a global scale and helping to stop global warming by providing products and services, and striving to conserve energy at our plants and other operational sites.

Action Plan to Reduce CO₂ Emissions

Fuji Electric participated in the voluntary action plan, designed by the electric/electronics industry, to achieve the reduction targets for the Kyoto Protocol, an international treaty aimed at preventing global warming, within its commitment period (FY2008-2012). In this way, we contributed to a reduction of CO₂ emissions. Overall, the industry is on track to achieve the targets on a 5-year average basis.

Also, Fuji Electric has joined the Low Carbon Society Action Plan, a new initiative that looks ahead to fiscal 2020, launched in fiscal 2013 by the electrical and electronics industry. The plan is aligned with the amended Act on the Promotion of Global Warming Countermeasures relating to global warming countermeasures from fiscal 2013 onward.

To reduce CO₂ emissions during production, Fuji Electric considers fuel and electricity use in terms of the amount of energy used as converted into crude oil, and aims to reduce this amount. Specifically, targets for energy consumption per base unit will be set for each domestic factory, such as the amount of electricity consumed per production volume, and we will strive to improve our performance.

Fuji Electric has also established targets for reducing CO₂ emissions per base unit overseas. Going forward, we plan to continue to publicly report the rate of improvement from the fiscal 2012 benchmark level in Japan, as well as announce the status of improvement for Fuji Electric as a whole, including overseas business sites.

Reducing Greenhouse Gas Emissions During Production

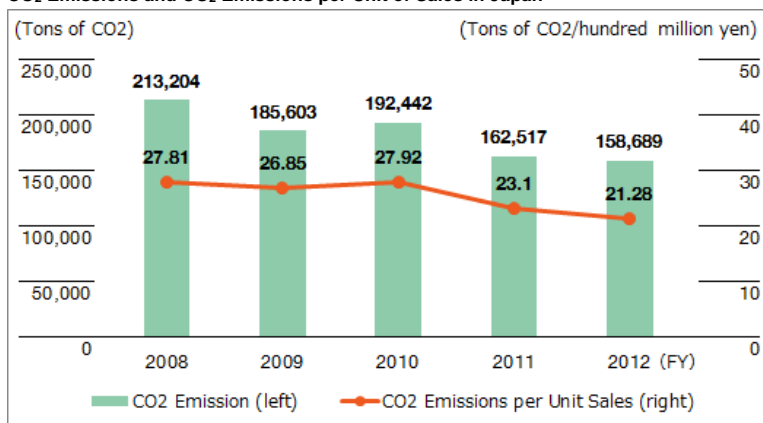
Fiscal 2012 CO₂ Emission Reduction Targets and Achievements

In fiscal 2012, Fuji Electric expanded its efforts to conserve energy and curb energy costs. While energy costs were expected to rise 7.2% with the impact of rate increases, we succeeded in holding the rise in cost to 1.9% by a combination of upgrading to higher-efficiency facilities and equipment, controlling the number of units in operation, and installing inverter systems to control peak power use, among other measures.

As a result, in fiscal 2012 we succeeded in reducing CO₂ emissions from production by 17.6% (compared to fiscal 2010 levels), exceeding our fiscal 2012 target of a 12.3% reduction.

Overseas, energy-saving diagnostics and other energy conservation activities resulted in a 6.1% reduction in CO₂ (compared to fiscal 2010), versus our fiscal 2012 target of a 2.6% reduction. In the Philippines, we have received awards from the Philippines Economic Zone Authority for two consecutive years in recognition of our environmental activities, including energy conservation initiatives.

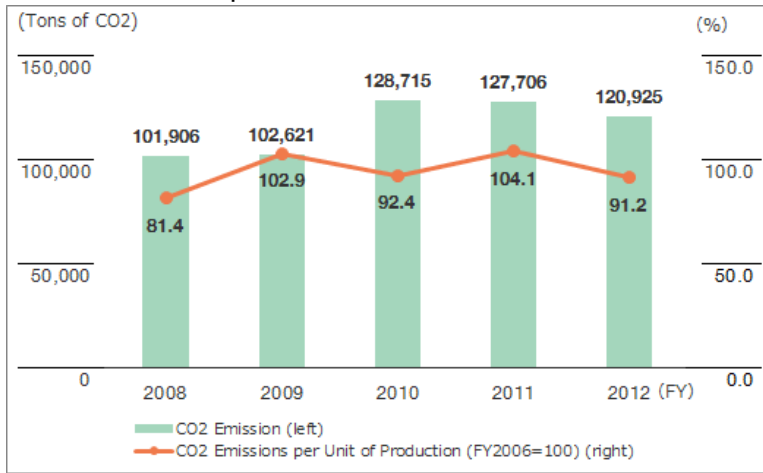
CO₂ Emissions and CO₂ Emissions per Unit of Sales in Japan



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 CO₂ emissions over consolidated net sales.
3. Emission estimates use the emissions coefficient for electric power users (336 tons of CO₂ per million kilowatt-hours in fiscal 2012), 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.
4. Because the Chiba Factory was integrated from fiscal 2012, data for the Chiba Factory is shown going back to fiscal 2008. Also, there are emissions from semiconductor factories that were integrated during the period.(18,330t-CO₂)

Overseas CO₂ Emissions per Unit of Production



Notes:

1. Overseas energy and electric power conversion coefficients obtained from the JEMA website (Ver. 3, March 2006)
2. CO₂ emissions per unit refer to units of sales, with fiscal 2006 = 100.

Reducing Greenhouse Gases other than CO₂ including SF₆

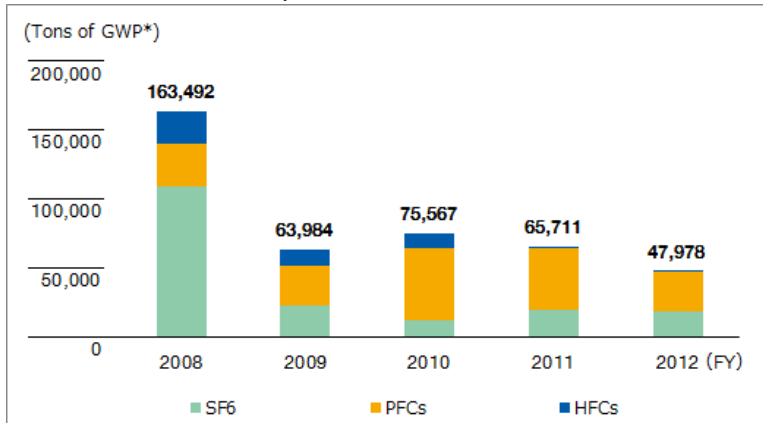
There are six broad types of greenhouse gases including CO₂ and various alternatives for chlorofluorocarbon.

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, we were successful in reducing the amount of emissions by 92% compared with fiscal 1995. Since fiscal 2010, we have switched our objective from reduction to maintenance and control, although we continue our reduction activities.

In fiscal 2012, emissions in Japan were 47,978 tons (down 27% year on year), and emissions overseas were 60,996 tons (down 11% year on year).

From fiscal 2013, the Kyoto Protocol enters its second commitment period. Based on the decisions made at the United Nations Framework Convention on Climate Change (COP 17, 18) as well as the amendment of the Act on the Promotion of Global Warming Countermeasures, NF₃ (nitrogen trifluoride) is expected to be added as a designated gas, and changes to global warming potential values are planned.

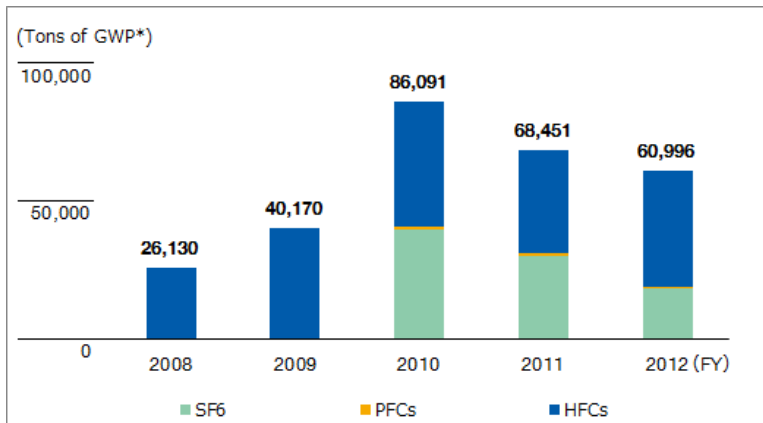
Emissions Other than CO₂ in Japan



Notes:

Because the Chiba Factory was integrated from fiscal 2012, data for the Chiba Factory is shown going back to fiscal 2008. Also, there are emissions from semiconductor factories that were integrated during the period.(11,186 GWPt)

Overseas Emissions Other than CO₂



*Global warming potential (GWP) measures the relative greenhouse effect caused by a gas compared with CO₂, which is assigned a GWP value of 1.

Smart Factory Initiative

In response to changes in power supply conditions in recent years, Fuji Electric has embarked on a new Smart Factory Initiative.

Under our Smart Factory Initiative, we coordinate effective use of our expertise in electric and thermal energy technology with production planning to optimize energy use.

In fiscal 2012, four of our factories - in Kawasaki, Tokyo, Yamanashi, and Mie - were selected for conversion to Smart Factory sites due to the proportion of electric and thermal energy used and the nature of their production methods. Having analyzed their unique energy usage patterns, and established a concept for implementing smart energy use based on those results, we have now started work to develop a concrete plan of action.

In fiscal 2013, we will verify the Smart Factory Initiative concept and then roll it out at other factories. The results will eventually lead to the development of smart factory proposals for our customers.

Reducing Social CO₂ Emissions through Products

Fuji Electric is aiming to reduce society's CO₂ emissions by providing Eco-Friendly Products and Environmental Contribution Products.

Eco-Product Certification Standards

One such initiative has been the establishment of common Fuji Electric Eco-Product Certification System designed to expand the range of "eco-products" and "super eco-products." The goal is to increase the ratio of sales of eco-products among overall sales to 70% by 2020.

Fuji Electric evaluates the degree of product eco-friendliness on a companywide platform. Products meeting fixed criteria are certified as "eco-products," while those that are at the top of the industry for environmental benefit and contribution, and which are recognized outside the Company at the national level for environmental superiority are labeled "super eco-products."



Eco-Product Definitions	
Eco-Friendly Products	Products that have a reduced environmental impact over the entire product lifecycle. These products are superior to traditional products in at least four of six standard areas, including energy conservation, resource conservation, and recyclability.
Environmental Contribution Products	Products that contribute to environmental preservation during use. Products that contribute to the environment by utilizing natural energy or information and communication technology.

In fiscal 2012, sales of eco-products accounted for 29.5% of total net sales, as compared to 40.9% in fiscal 2011. The result was lower than our target of 45% due to changes in the compositional ratios of products in net sales. In fiscal 2013, Fuji Electric will continue to promote the development of eco-products and strive to increase the eco-product sales ratio.

Fiscal 2012 Promoting Super Eco-Products

In the 33rd Annual Superior Energy Conserving Machinery Awards held by the Japan Machinery Federation in fiscal 2012, Fuji Electric was recognized with the Agency for Natural Resources and Energy Director's Award for its HX Series of uninterruptible power supplies (UPS) equipped with a 3-level IGBT module, and for its PVI Series of power conditioners (PCS).

Both products were recognized for their world-class energy-saving performance. Fuji Electric's proprietary new 3-level IGBT module significantly reduces power losses generated in the conversion between alternating and direct current, with the HX series of UPSs achieving a conversion efficiency of 97%, and the PVI series of PCSs achieving 98.5% efficiency.

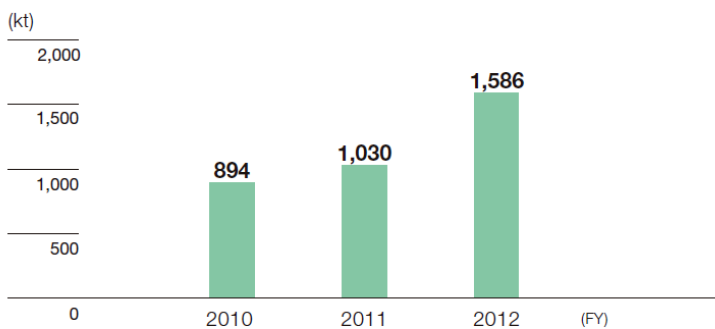
Elsewhere, we newly registered five super-eco products in fiscal 2012. These included a thin switchgear board (SLIMEC-V6) which requires one-fourth the usual installation space, as well as a hybrid heat pump-type can/bottle vending machine that uses substantially less electricity than existing models.



Reducing CO₂ Emission through Our Products

In fiscal 2012, we achieved a reduction of 1.58 million tons from the operation of shipped products for one year, exceeding the fiscal 2011 result of, 1.03 million tons by 0.56 million tons.

Reduced CO₂ Emissions through Products



*Amount of CO₂ reduction based on one year of operation of products shipped for each fiscal year

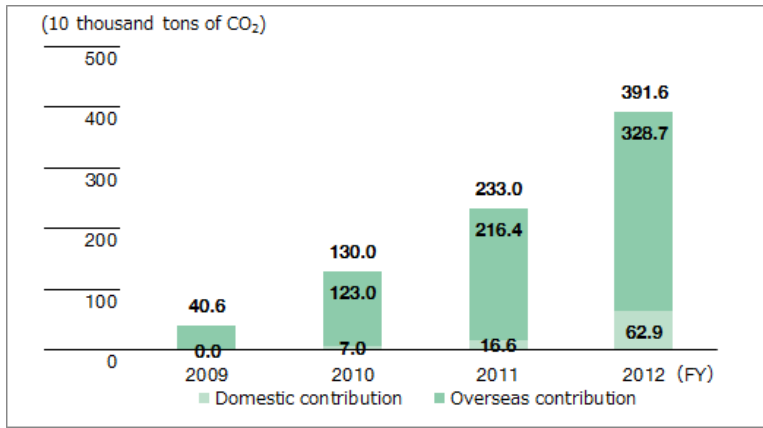
*Calculated making reference to the quantification method of GHG emission reductions stipulated in the Electrical and Electronics Industries' Commitment to a Low Carbon Society

Also, in line with the trend in the industry, changes were made to the method for calculating the contribution to CO₂ emissions reduction*, so that the contribution is now divided between Japan and overseas. As a result, the Company's products shipped between fiscal 2009 and fiscal 2012 contributed a CO₂ emissions reduction amount of 3.916 million tons of when operated for one year. Of this total contribution amount, power generation products, including geothermal, hydroelectric, biomass, and solar, accounted for 72.3%, while inverters, electronics devices and other components accounted for 22.2%, and other products like vending machines, showcases and UPSs accounted for 3.6%.

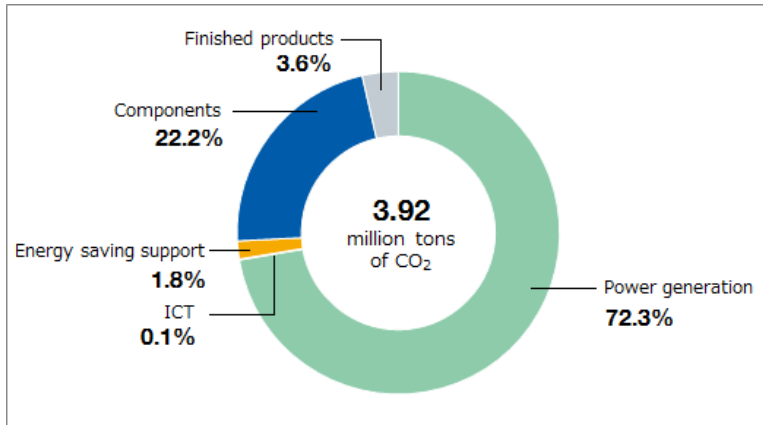
For Fuji Electric products shipped in fiscal 2012, the total contribution amount of CO₂ emissions reduction would be 28.19 million tons of CO₂ if the products were operated for the duration of their operating lives.

*Referring to the calculation method stipulated in the electrical and electronics industry's Low Carbon Society Action Plan in fiscal 2012, Fuji Electric changed its calculation method from computing the CO₂ from the shipment year alone to calculating the CO₂ after adding those products that are operated even after the shipment year. Also, the CO₂ emissions coefficient was revised from the fiscal 2006 value to the most recent value. In conjunction with this, we adopted a unified expression for referring to the CO₂ emissions reduction amounts: "the CO₂ emissions reduction contribution amount," and we plan to revise the Environmental Vision 2020 medium- to long-term targets accordingly.

CO₂ Emissions Reduction Contribution Amount





Breakdown of CO₂ Emissions Reduction Contribution Amount



ICT: Information & Communication Technology

Products that Contribute to Reducing CO₂ Emissions

Here, we will introduce some of Fuji Electric's eco-products that help prevent global warming by reducing CO₂ emissions. In fiscal 2012, we revised the "Products that Contribute to Reducing CO₂ Emissions," comprising all of our eco-products. We are now presenting the contribution to emissions reductions computed using the latest CO₂ emissions coefficients. (All 70 models as of fiscal 2012).

Power Plants	
Geothermal Power Generation Facilities	
<p>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, CO₂ 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.</p> <p>CO₂ emissions reduction: approx. 552,000 tons / year</p> <p>(Compared to thermal power generation) Effect calculated under typical operating conditions (when product in use) Geothermal steam turbine: output 147MW, utilization rate 90% CO₂ emission factor 0.476kg-CO₂/kWh</p>	 <p>Wayang Windu Geothermal Power Station in Indonesia</p>
Factories	
Inverters	
<p>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.</p> <p>CO₂ emissions reduction: approx. 11.9 tons / year (50.0% reduction)</p> <p>(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%) CO₂ emission factor 0.476kg-CO₂/kWh</p>	

Data Centers

Module Type Data Centers

Significant reductions in electricity consumption were realized by using a hybrid air conditioner unit which uses both external air-cooling and an air conditioner using refrigerant at the same time. Also, the centers use a dedicated facility operation management system, to centrally manage electricity, heat source, air conditioning, and the environment for optimal operation.

CO₂ emissions reduction: approx. 156 tons / year (60.0% reduction)

(Compared to Non-hybrid Air Conditioner)

Effect calculation for when product is in use is based on typical operating conditions.

Operating conditions: Annual operation time 8760 hours

Conventional product: Average annual power consumption 62.4 kW

Current product: Average annual power consumption 25.0 kW

CO₂ emission factor 0.476kg-CO₂/kWh



Office Buildings

UPSs

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.

CO₂ emissions reduction: approx. 62.4 tons / year (71.1% 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, 500kVA, 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%

CO₂ emission factor 0.476kg-CO₂/kWh



3-level IGBT Modules

IGBT modules are a type of power semiconductor. They are used in UPSs and solar power generation facilities, and are essential to realizing energy savings.

CO₂ emissions reduction: approx. 987 kg / year (23.4% reduction)

(Comparison Comparison of 2-level and 3-level IGBT Module)

Effect calculation for when product is in use is based on typical operating conditions.

Operating conditions: With a 100 kW inverter annual operation time 2920 hours

CO₂ emission factor 0.476kg-CO₂/kWh



Stores

Building Energy Management Systems

Stores

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.

CO₂ emissions reduction: approx. 23 tons / year (8.0% 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: CO₂ 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.

CO₂ emissions reduction: approx. 376 kg / year (48.1% 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

CO₂ emission factor 0.476kg-CO₂/kWh



Energy Conservation Initiatives in Logistics

To reduce CO₂ emissions in logistics, specified shippers those shipping annual tonnages exceed 30 million tons have been required to measure and improve their energy consumption since April 2006.

Fuji Electric has established the Guidelines for Shippers' Obligations to enable each business site to comply with these laws and regulations smoothly and appropriately. The guidelines have informed shippers about matters including the scope of CO₂ emissions measurements, the method for calculating CO₂ emissions, reporting procedures, and the role of people in charge. In addition, Fuji Electric is centrally managing data using FeSMART in order to ascertain the environmental burden due to logistics activities.

In fiscal 2012, two factories (Chiba, Tsugaru *2) were newly added, so there was an increase in the transport of parts and products. As a result, there was a year-on-year rise in CO₂ emissions from logistics.

Going forward, Fuji Electric will continue to enhance its energy conservation activities in the logistics sector and work to reduce its environmental footprint.

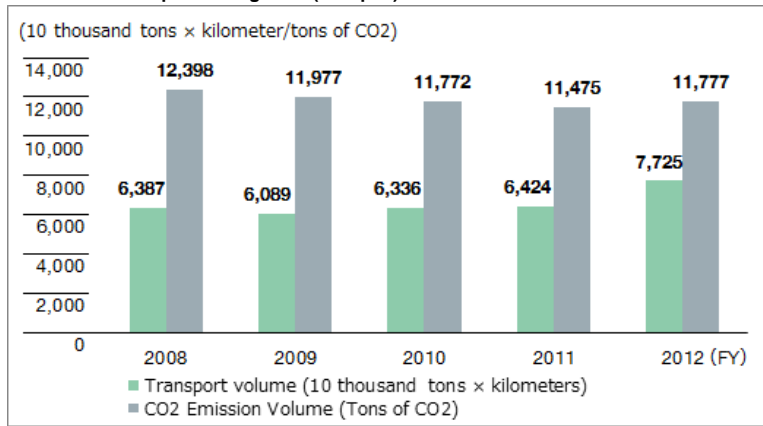
Fuji Electric's Retail Systems Co., Ltd., which produces vending machines and other products, had been designated as a specified shipper, but this designation was lifted following the merger with Fuji Electric in October 2012. Instead, from fiscal 2013 Fuji Electric will be designated as a specified shipper.

*1 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.

*2 Tsugaru: Fuji Electric Tsugaru Semiconductor Co., Ltd.

Environmental Impact of Logistics (In Japan)



Reduction of CO₂ Emissions on “Milk Run”

At the Suzuka Factory in Japan, we are focusing on reducing CO₂ 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 round trips between the Company's factory and the six component manufacturers. Now, one large truck is driven around all six companies to collect parts. This has resulted in an annual CO₂ emission reduction of 4.5 tons.

Looking ahead, we plan to introduce the milk run system to other factories to further reduce the environmental impact of transporting parts.

Copyright©2013 Fuji Electric Co.,Ltd. All Rights Reserved.