

# Review of Operations — Financial Results for Fiscal 2012

## Increase in Sales and Profits

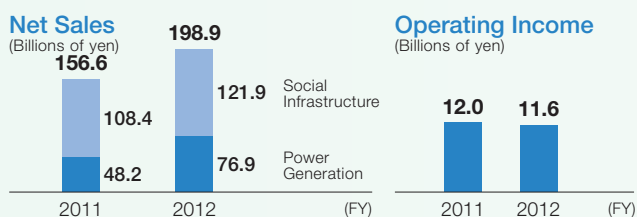
Net sales increased ¥42.2 billion year on year, to ¥745.8 billion, largely due to the contributions of large-scale contracts in the power generation business and the depreciation of the Japanese yen.

Operating income improved ¥2.7 billion year on year, to ¥22.0 billion. This was because the benefits of thorough cost reduction measures, as well as the business restructuring initiatives implemented in the previous fiscal year, outweighed the impacts of intensified cost competition.

Results for each segment were as follows.

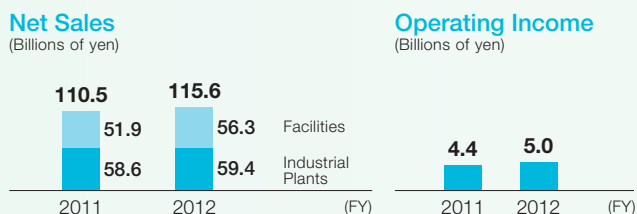
\* The following results are stated based on figures prior to reflecting the change in subsegments that took effect from April 1, 2013.

## Power and Social Infrastructure



Sales in the power generation business were up year on year due to large scale orders for thermal power plants, but operating results worsened due to the heavy impacts of intensified cost competition, despite the effect of cost reduction measures.

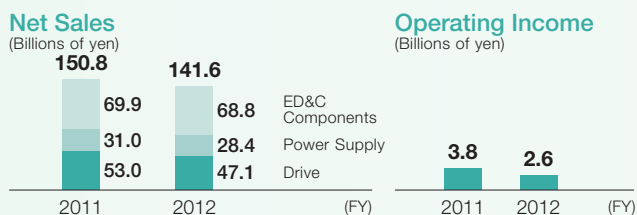
## Industrial Infrastructure



In the industrial plants business, sales increased year on year due to relatively firm replacement demand in Japan.

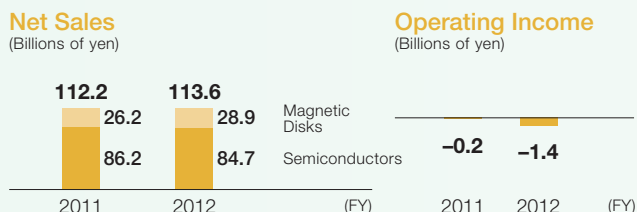
Sales also increased in the facilities business, which benefited from domestic replacement demand and revenues from large-scale projects overseas.

## Power Electronics



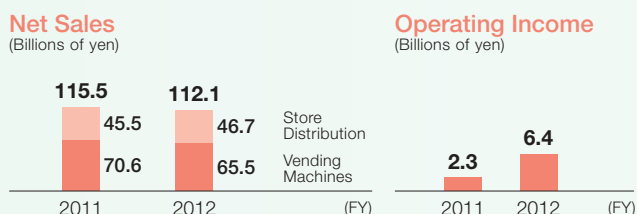
In the drive business, sales decreased year on year following sluggish demand from capital expenditure in China and other overseas markets. However, the benefits of lower costs and general expenses resulted in improvements in operating results.

## Electronic Devices



In the semiconductors business, demand in the automotive electronics business was relatively firm, while demand in the industrial and power supply application businesses was down. Industrial demand was down because of globally restrained capital expenditure, and power supply applications were impacted by a slump in the market for TVs and IT

## Food and Beverage Distribution



In the vending machines business, there was strong replacement demand for energy-saving environmentally friendly vending machines, and demand for coffee machines for convenience stores. However, sales declined year on year after sales of all food and beverage items sold in vending machines were stopped.

	Net Sales			Operating Income/Loss		
	(Billions of yen)			(Billions of yen)		
	FY2011	FY2012	Change	FY2011	FY2012	Change
<b>Power and Social Infrastructure</b>	156.6	<b>198.9</b>	42.3	12.0	<b>11.6</b>	-0.4
<b>Industrial Infrastructure</b>	110.5	<b>115.6</b>	5.1	4.4	<b>5.0</b>	0.7
<b>Power Electronics</b>	150.8	<b>141.6</b>	-9.2	3.8	<b>2.6</b>	-1.2
<b>Electronic Devices</b>	112.2	<b>113.6</b>	1.4	-0.2	<b>-1.4</b>	-1.2
<b>Food and Beverage Distribution</b>	115.5	<b>112.1</b>	-3.4	2.3	<b>6.4</b>	4.2
<b>Others</b>	112.6	<b>116.9</b>	4.3	2.6	<b>2.9</b>	0.2
<b>Elimination and Corporate</b>	-54.7	<b>-52.9</b>	1.7	-5.6	<b>-5.2</b>	0.4
<b>Total</b>	703.5	<b>745.8</b>	42.2	19.3	<b>22.0</b>	2.7

In the social infrastructure business, demand for solar power generation systems rose following the launch of the feed-in tariff scheme for renewable energy, driving year on year improvements in net sales and operating results accordingly.



Delivery of gas-turbine combined-cycle power generation equipment (Okinawa Electric Power Company, Incorporated Yoshinoura Thermal Power Station)

While operating results in both businesses were impacted by intensified cost competition, these impacts were outweighed by the benefits of higher sales and lower costs, and operating results improved year on year for both businesses accordingly.



Delivery of a large-capacity rectifier package to one of the world's largest aluminum smelters in the UAE (Emirates Aluminium, UAE)

In the power supply business, sales and operating results worsened due to decreased demand for power supplies for the manufacturing industry and for use in IT equipment.

Meanwhile, lower demand from machinery manufacturers in the Japanese market led to the deterioration of sales and operating results in the ED&C components business.



Inverters developed to expand the series of products as part of moves to step up development and commercialization of products that meet local market needs

equipment such as PCs. As a result, both sales and operating results worsened.

In the magnetic disks business, sales increased year on year following the depreciation of the Japanese yen and operating results improved due to the benefits of the business restructuring initiatives implemented in the previous fiscal year.



Fuji Electric acquired a subsidiary of Renesas Electronics Corporation and established Fuji Electric Tsugaru Semiconductor Co., Ltd. with a view to enhancing its production capacity for power semiconductors and dispersing risk

In the store distribution business, sales rose as a result of increased orders for freezing, refrigerating, and energy-saving facilities for convenience stores and other establishments.

Operating results improved for the overall segment due to the benefits from the business restructuring initiatives implemented in the previous fiscal year as well as cost reductions and the introduction of new products.



Coffee machines providing high-quality, fragrant coffee were launched simultaneously in major convenience store chains

# Review of Operations — Management Plan for Fiscal 2013

## Expand Sales and Profit Mainly in Power Electronics and Semiconductors

In fiscal 2013, we envision net sales rising ¥4.2 billion year on year to ¥750.0 billion with operating income growing ¥5.0 billion to ¥27.0 billion. We aim to accomplish this mainly by expanding power electronics and semiconductors on the back of domestic and overseas recovery in capital expenditures, and climbing demand for solar power generation systems in Japan.

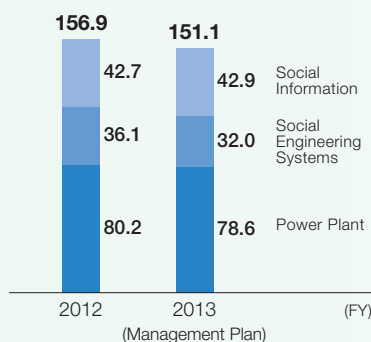
We will take the following initiatives in each segment.

\* Effective April 1, 2013, changes were made to subsegments in the Power and Social Infrastructure, Industrial Infrastructure, Power Electronics, and Others segments reflecting revisions to the segments' scope of operations. Accordingly, fiscal 2012 results are shown here under the new segmentation.

## Power and Social Infrastructure

### Net Sales

(Billions of yen)



### Operating Income

(Billions of yen)



### Subsegments

Power Plant

Social Engineering Systems

Social Information

### Main Business Areas

Thermal/Geothermal/  
Hydraulic power generation

Nuclear power-related equipment

Solar power generation systems

Energy management systems

Watt-hour meters

Information systems

### Forecast for Fiscal 2013 Sales and Operating Results

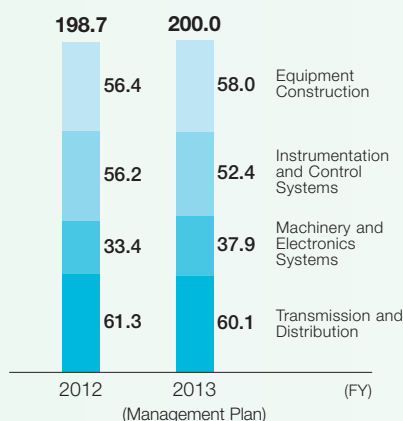
Despite strong growth in solar power generation systems, we project the segment's net sales will edge down ¥5.8 billion year on year to ¥151.1 billion in fiscal 2013, owing to fewer large projects for thermal power plants and a lapse in demand before the switchover to smart meters (next generation watt-hour meters) from watt-hour meters.

We are projecting operating income to decline by ¥0.4 billion year on year to ¥8.0 billion.

## Industrial Infrastructure

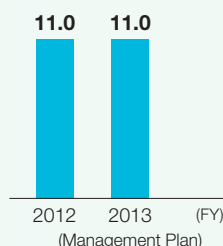
### Net Sales

(Billions of yen)



### Operating Income

(Billions of yen)



### Subsegments

Transmission and Distribution

Machinery and Electronics Systems

Instrumentation and Control Systems

Equipment Construction

### Main Business Areas

Transmission and distribution equipment, Industrial power supply equipment

Industrial drive systems, Heating and induction furnace equipment

Factory energy management systems

Data centers, Clean room facilities

Plant control systems, Measurement systems

Radiation monitoring systems

Electrical and air conditioning equipment installation

### Forecast for Fiscal 2013 Sales and Operating Results

We project that the segment's net sales will edge higher by ¥1.2 billion year on year to ¥200.0 billion, driven by higher sales of products and systems for overseas markets, and despite a decline in sales relating to radiation equipment.

We expect that operating income will be on par with the previous year at ¥11.0 billion.

	Net Sales			Operating Income/Loss		
	(Billions of yen)			(Billions of yen)		
	FY2012	FY2013	Change	FY2012	FY2013	Change
<b>Power and Social Infrastructure</b>	156.9	<b>151.1</b>	-5.8	8.4	<b>8.0</b>	-0.4
<b>Industrial Infrastructure</b>	198.7	<b>200.0</b>	1.2	11.0	<b>11.0</b>	0
<b>Power Electronics</b>	148.4	<b>164.5</b>	16.1	1.2	<b>4.8</b>	3.6
<b>Electronic Devices</b>	113.6	<b>111.7</b>	-1.9	-1.4	<b>1.5</b>	2.9
<b>Food and Beverage Distribution</b>	112.1	<b>115.4</b>	3.3	6.4	<b>6.7</b>	0.3
<b>Others</b>	60.6	<b>56.9</b>	-3.7	1.6	<b>1.5</b>	-0.1
<b>Elimination and Corporate</b>	-44.5	<b>-49.4</b>	-5.0	-5.3	<b>-6.6</b>	-1.3
<b>Total</b>	745.8	<b>750.0</b>	4.2	22.0	<b>27.0</b>	5.0

### Initiatives in Fiscal 2013

#### Expand Orders and Sales of Solar Power Generation Systems, and Increase Orders for Thermal and Geothermal Power Station Systems

In the power generation business, we will work to increase orders and sales for solar power generation systems in line with anticipated strong demand in Japan. We will also work to increase orders for thermal and geothermal power generation systems in Asia and other overseas markets.

In social engineering systems, we will endeavor to commercialize smart communities. In addition, further development initiatives pertaining to full-scale introduction of smart meters will be advanced together with preparations for the mass production of these meters.



Work to expand orders and sales of solar power generation systems (Kyushu Solar Farm 7 Miyama Joint Power Station)



A power conditioner

### Initiatives in Fiscal 2013

#### Focus on Energy-saving Businesses and Strengthen Operations in Asia

Fuji Electric will focus on capturing replacement demand in Japan and on energy-saving businesses. Overseas, business expansion efforts will be focused on Asia.

In transmission and distribution, we will consolidate businesses handling power transformation equipment, which is vital to infrastructure building, accelerate new product development, and strengthen our ability to compete on price by expanding overseas production sites.

For machinery and electronics systems, we will use electricity and heat energy visualization and optimization to make entire factories more energy efficient, including machinery, and increase their productivity.

In instrumentation and control systems, we will link various equipment and systems to provide total solutions for entire plants.

Further, we will collaborate with the segment's equipment construction business to bolster engineering services and further expand the solutions business.

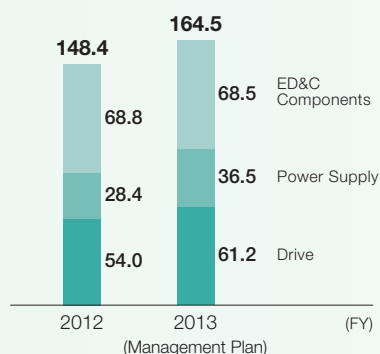


Transforming equipment being installed onsite for Kappa Substation of Eskom Holdings, a state owned-power producer in the Republic of South Africa

## Power Electronics

### Net Sales

(Billions of yen)



### Operating Income

(Billions of yen)



### Subsegments

Drive
Power Supply
ED&C Components

### Main Business Areas

Inverters/ Servo systems, Motors
EV systems, Transport systems
Uninterruptible power supply systems (UPSs)
Power conditioners (PCs)
Power distribution and control equipment

### Forecast for Fiscal 2013 Sales and Operating Results

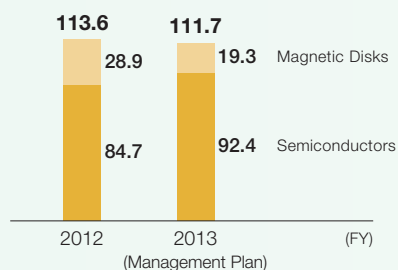
We are projecting a ¥16.1 billion increase in the segment's net sales to ¥164.5 billion. The main factors are expected to be sales expansion, mainly of new inverter products, and higher sales of PCs.

Operating income is expected to climb ¥3.6 billion to ¥4.8 billion, owing to the increase in sales, coupled with the beneficial effects of business restructuring carried out in the previous fiscal year.

## Electronic Devices

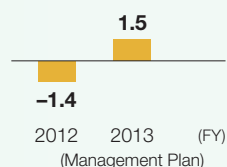
### Net Sales

(Billions of yen)



### Operating Income

(Billions of yen)



### Subsegments

Semiconductors
Magnetic Disks

### Main Business Areas

Power semiconductors
Photoconductive drums, Solar cells
Magnetic disks

### Forecast for Fiscal 2013 Sales and Operating Results

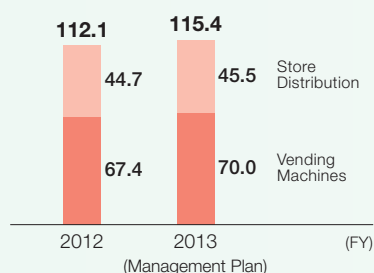
We project that the segment's net sales will edge lower by ¥1.9 billion year on year to ¥111.7 billion, due to a sharp drop in sales of magnetic disks. Meanwhile, we are projecting higher sales for power semiconductors, mainly in the industrial and automotive sectors.

Operating income is projected to return to profit, changing by ¥2.9 billion year on year to ¥1.5 billion. This result is expected due to the effects of increased sales of power semiconductors and business restructuring in the previous fiscal year. Profits are expected to decline in magnetic disks, however.

## Food and Beverage Distribution

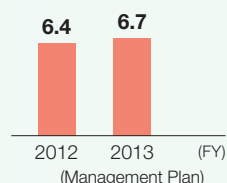
### Net Sales

(Billions of yen)



### Operating Income

(Billions of yen)



### Subsegments

Vending Machines
Store Distribution

### Main Business Areas

Food and beverage vending machines
Retail distribution systems
Showcases
Currency handling equipment

### Forecast for Fiscal 2013 Sales and Operating Results

We are projecting segment net sales to increase ¥3.3 billion year on year to ¥115.4 billion. We expect the increase to be driven by higher sales of vending machines in Japan and expanded vending machine operations in China, along with higher sales of retail distribution systems. Meanwhile, sales will be offset by lower sales from vending machine contents (food and beverages) as sales of these have stopped.

We are projecting operating income to grow by ¥0.3 billion year on year to ¥6.7 billion, due to the effect of increased sales and reduced costs.

### Initiatives in Fiscal 2013

#### Overseas Sales Growth Driven by Global Launch of New Products

For drives and power supplies, we will proactively develop and launch new products for the global market in our mainstay areas including inverters, UPSs, and PCs. Concurrently, we will work to reinforce our price competitiveness by expanding production at our new factory in Thailand. We will also focus on developing new products equipped with next-generation power semiconductors (SiC devices), which offer lower power consumption, strong performance in high temperature environments, and miniaturization of the equipment in which they are used.

In ED&C components, we will concentrate on the new energy field in Japan while striving to enhance product lineups and grow sales in Asia and China.



Develop global products such as compact inverters (left) and uninterruptible power supply systems (UPSs) (right) to expand business in Asia and China

### Initiatives in Fiscal 2013

#### Strengthen Power Semiconductors in the Industrial and Automotive Sectors

We will target power semiconductor sales growth, driven by demand recovery in the industrial sector and robust demand in the automotive sector.

In addition, we will look to increase productivity by starting up processing lines for 8-inch wafers, while enhancing price competitiveness by expanding overseas production in countries like Malaysia and China. Moreover, we will speed up the spread of SiC devices—next-generation power semiconductors—by establishing state-of-the-art processing lines for 6-inch wafers for their production.



Start of processing and mass-production of 8-inch wafers for power semiconductors at the Yamanashi Factory

### Initiatives in Fiscal 2013

#### Launch New Vending Machine Models and Increase Business in China

In vending machines, we will bolster development of hybrid heat pump vending machines and other environmentally friendly vending machines.

Additionally, we will work to increase business in China's growing vending machine market by reinforcing our operations capabilities with the addition of two local subsidiaries as consolidated subsidiaries from fiscal 2013.

In store distribution, we will strive to grow orders for store equipment from supermarkets and convenience stores. We will also take steps to expand into new fields such as refrigerated distribution, providing total solutions that leverage our cooling technology to cover every part of the journey from where food is produced to where it is consumed.



Hybrid heat-pump vending machines significantly reduce power consumption

# Review of Operations — Overseas Operations

## Major Initiatives in Fiscal 2012

### Prepared a Base for Expanding Overseas Businesses

The European debt crisis made for a weak market, and demand was especially slow to pick up in China. Conditions were generally harsh, mainly for power electronics and semiconductors of electronic devices. As a result, overseas sales were flat year on year at ¥178.5 billion in fiscal 2012.

Against this backdrop, we forged ahead with the construction of manufacturing, sales, and engineering foundations for overseas business expansion. In manufacturing, we began building a new factory in Thailand looking to grow power electronics sales, chiefly in Asia. We also set up production lines for back-end processing in Shenzhen, China, as a step to expand our business in China's power semiconductor market. Further, we endeavored to augment engineering functions in Singapore and Indonesia to drum up more plant business focused on industrial infrastructure.

## Major Initiatives in Fiscal 2013

### Expand Production Overseas and Increase Sales through New Global Products

We are targeting sales growth in the industrial infrastructure and power electronics businesses, as well as in semiconductors in the electronic devices business, and vending machines in the food and beverage distribution business. For power electronics, we will develop new global products and expand production at the new factory in Thailand. For power semiconductors, we aim to strengthen price competitiveness by increasing production at the new factory in Shenzhen, China. We will also work to grow vending machine operations, mainly in China, and build up our customer base for the industrial infrastructure business in Asia and China by enhancing sales and engineering networks.

In fiscal 2013, we aim to grow overseas sales by 4% year on year to ¥186 billion.

### Asia and Others

For the Asian market where industrial infrastructure investment is expected to expand, we will actively deploy new global products that are produced locally, such as inverters, UPSs, and PCSs, with an eye to sales expansion.

In addition, we will work to boost orders for thermal and geothermal power generation equipment, and plants and systems for materials industries. At the same time, we will strengthen our ability to meet local needs by establishing sales bases in South Korea, Vietnam, Myanmar, and Cambodia.

### China

Looking to increase power semiconductor sales in China, we built a new wing for back-end processing production lines at our Shenzhen factory. The objective is to promote product development and production in tune with local needs, and to strengthen our competitive edge. We also aim to expand business by extending our sales network, mainly in industrial infrastructure, and collaborating with local companies to find new customers. In the vending machine business as well, we aim to shore up our operational foundation through the consolidation of two local subsidiaries as we aggressively expand into the China market.

### Europe

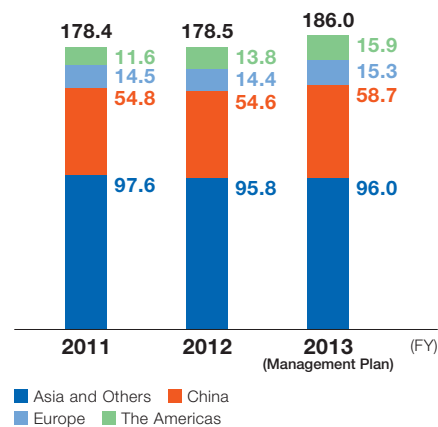
In Europe, demand related to renewable energy and energy conservation is expected to climb. We will work here to augment sales capabilities starting with sales bases and technical centers, roll out new products including power semiconductors and inverters, and reinforce fuel cell sales.

### The Americas

In addition to capital participation in a power provider's geothermal project, we will work to increase orders, including by cultivating new customers in fields such as thermal power and biomass power generation equipment. We will also work to tap into major future growth projected in the South American region. Here, our Brazil sales base established in January 2013 will lead development of the inverter, power semiconductor, and industrial plant and system markets.

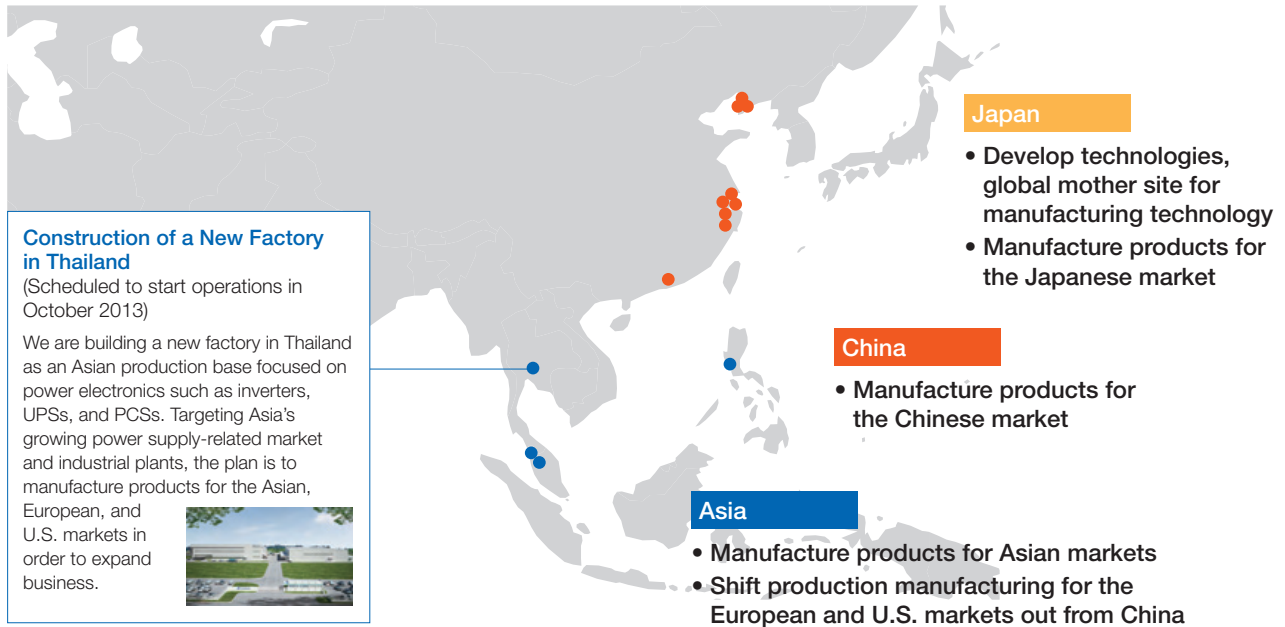
### Overseas Sales

(Billions of yen)



## Three-Hub Manufacturing Structure

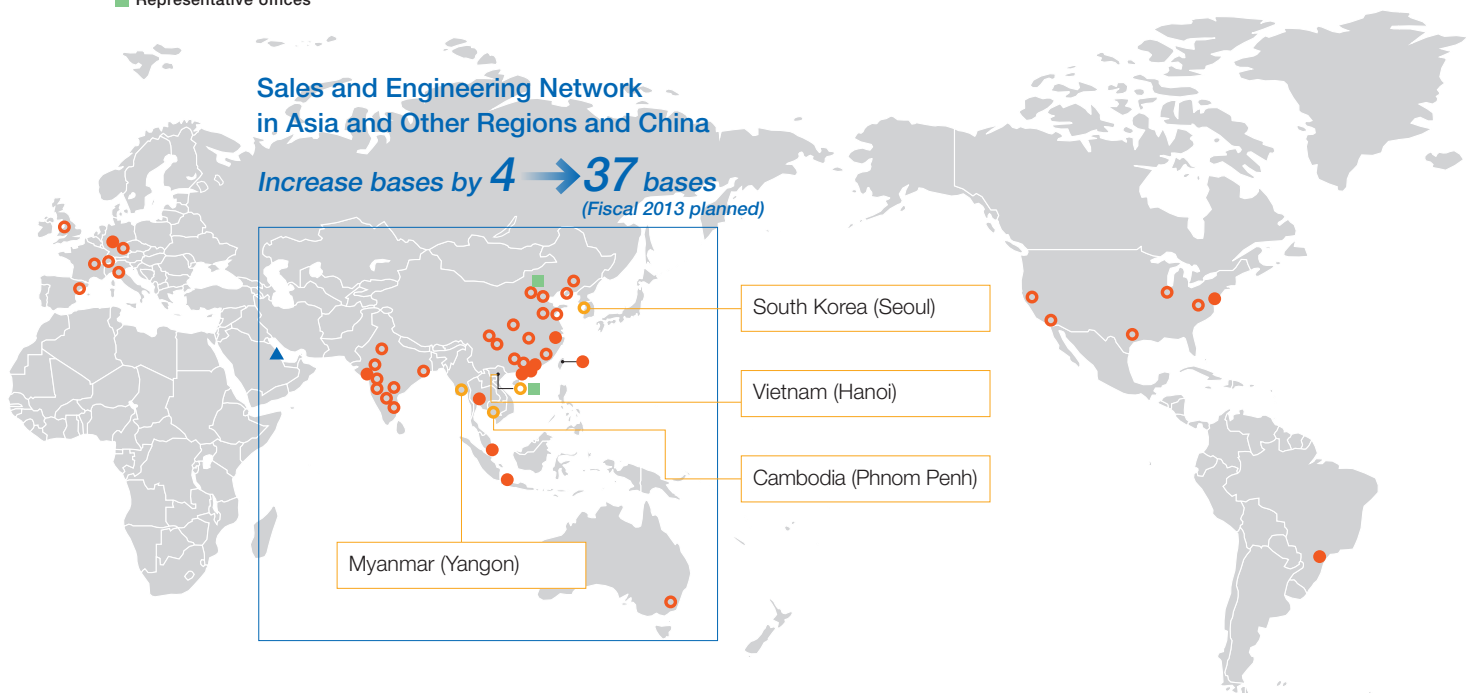
To ensure quality and bolster cost competitiveness as well as distribute risk, we will establish manufacturing hubs in the three countries and regions of Japan, China, and Asia.



## Enhance Sales and Engineering Network

We will enhance our sales and engineering network, mainly in Asia and China.

- Sales subsidiaries
- Branches and sales offices of sales subsidiaries (existing)
- To be established in fiscal 2013 (including planned)
- ▲ Branches
- Representative offices





# Manufacturing

Based on the approach of local design, production, and usage of its products, Fuji Electric positions Japanese production bases as the mother factories for global manufacturing operations, and has two other hubs in China and Asia. To further enhance our manufacturing capabilities, we have focused on our frontline capabilities, including reforms of supply chains and materials procurement. Going forward, we will also work to strengthen our capabilities in terms of production technology and human resources, with the view to honing our competitiveness further.

## Three Pillars Supporting Manufacturing

### On-Site Capabilities

The ability to enhance skills required at manufacturing sites, and to achieve benefits such as improved productivity and reduced costs



### Manufacturing Technology

The ability to develop and apply manufacturing methods, production processes, and production equipment to achieve customer satisfaction

### Human Resource Development

The handing down of our accumulated technologies and skills that are necessary for innovation in manufacturing

## Major Initiatives in Fiscal 2012

### Strengthening Production Technology Capabilities

We have gathered core production technology personnel at the Facility Technology Center in the Saitama area to develop facility technologies as well as core fundamental technologies. The achievements were applied to actual production facilities and production process improvements in coordination with various Fuji Electric factories. Specifically, as measures to automate production facilities and

lines, we have taken steps to enhance the facility technologies of manufacturing sites by converting tasks and original ideas at these manufacturing sites into simple automated equipment. Harnessing factory automation technology, we are also working on such initiatives as developing automated lines that can support manufacturing of multiple product models in varying quantities.

#### Simple Automation in Assembly (Otagawa Factory, Fuji Electric FA Components & Systems Co., Ltd.)

We have developed simple automated systems that automate tasks in the breaker assembly process, such as tightening screws and affixing nameplates, at a low cost. We have made screw tightening tasks more efficient by having workers supply the screws and machines perform the screw tightening process. Going forward, we will expand these production technologies globally by applying this system to factories overseas.



Automated screw tightening system

#### Horizontal Development to Overseas Production Bases (Mie Factory to Dalian Fuji Bingshan Vending Machine Co., Ltd.)

Eyeing expansion in the vending machine business in the Chinese market, we have fully remodeled our production line into one that supports the production of multiple product models. When remodeling the line, employees of Dalian Fuji Bingshan Vending Machine Co., Ltd. trained for about a month at the Mie Factory, a mother plant, to obtain expertise in upgrading production lines before completing the remodeling.



Production line at Dalian Fuji Bingshan Vending Machine Co., Ltd.

## Bolstering Human Resource Development

To strengthen manufacturing capabilities, which are fundamental to manufacturers, our factories in Japan are working to amass technologies and expertise in-house while nurturing production engineers and technicians who can succeed at overseas manufacturing bases.

We have made various training programs compulsory, including level-based training on fundamental technologies needed for manufacturing as well as basic training on quality control (QC), industrial engineering (IE), and other subjects for young employees in their second year. Furthermore, we conducted practical training on basic technical skills at the Technical Training Center for new employees, some of whom went on to participate in the National Skills Competition.

### Manufacturing Training System

	Engineers	Technicians	
<b>Managers</b>	Management training for managers and senior managers		
<b>Regular employees</b>	Practical training on core technologies (by level), 24 courses in total		Supervisor training (by level) Assistant Manager Supervisor Leader
	Application	Manufacturing technologies	
<b>Young employees/new hires</b>	Basic training	Manufacturing technologies	Management technologies
	Basic technology training (IE, QC, VE), 2nd year	New technician training (1 year)	National Skills Competition (3 years)

### Learning Everything from Basic to Specialist Skills (Technical Training Center, Saitama)

In technical training for new employees, trainees learn the fundamentals of manufacturing through a year-long dormitory-based training curriculum. From April to August, new employees learn basic tasks such as soldering and tightening screws. From September, the trainees acquire specialist knowledge in electronic devices, machining and other fields. Among the total of approximately 1,800 hours of education and training received, the trainees undergo 1,400 hours of certified training toward the final goal of obtaining qualification. The goal is to train employees who can start contributing immediately after they are assigned to their work stations.



An induction ceremony at the Technical Training Center

### Taking on the Challenge of the National Skills Competition

Fuji Electric grooms certain employees to participate in the National Skills Competition, which is a technical skills contest for young people (aged 23 or under, in principle). Through this initiative, the Company seeks to transfer the skills of outstanding technicians to younger employees. In the 50th National Skills Competition held in October 2012, three Fuji Electric employees participated in the die-cutting category. All three received a fighting-spirit award for their work.



Young people compete at the National Skills Competition

Voice

### Comment from an Employee



**Katsumi Santo**  
Technical Training Center  
Technical and Skills Training Department  
Facility Technology Center  
Production and Procurement Group  
Fuji Electric Co., Ltd.

#### Using Skills to Interact with the Local Community

Saitama Prefecture, Japan, holds a Manufacturing Fair every year as an initiative to energize local industry. As part of its contribution to the community, Fuji Electric sends trainees from the Technical Training Center to participate in the fair. In 2012, the trainees held an event where they produced and sold handmade key chains made of metallic materials.

The event was managed entirely by the trainees, and provided them with a good opportunity to convey the challenges and appeal of skilled manufacturing to local children.



Trainees helped elementary school children make key chains

# Procurement

In order to increase earning power and reduce risk, Fuji Electric has built a global procurement system and strives to reduce the costs of the materials used in products and to keep indirect expenses down.



Members of the IPO Division of Fuji Electric (China) Co., Ltd

## Procurement Policy

- Build a global purchasing system
- Reduce indirect costs such as office supplies
- Reduce procurement risk

## Major Initiatives in Fiscal 2012

### Build a Global Procurement System

Fuji Electric has built an optimal procurement system on a global basis with the aim of bolstering the Company's ability to earn profits.

Aiming to establish International Procurement Offices (IPO) in the four bases of China, Thailand, Singapore, and the U.S., we have cultivated new, blue-chip suppliers at each location, and will continue to provide optimal procurement services to production bases. Also, in order to increase procurement of materials with specifications suited to each region, we have started to enhance our development

purchasing activities by having the procurement division be involved from the development and design phase of new products.

In fiscal 2012, the IPO function was added at Fuji Electric (China) Co. Ltd., and all employees were educated thoroughly about the procurement policy. In fiscal 2013, we will be expanding the IPO function to Thailand and other bases in Asia as well as the U.S., and increasing the local procurement of components, plant materials, and construction work.

### Reduce Procurement Risk

As a part of the Business Continuity Plan (BCP), we have secured multiple suppliers for key components as a means of reducing procurement risk and building a stable and continuous procurement platform. In addition to disaster

risk and the like, we also considered currency risk and decided to have one of the suppliers be an overseas company.

\* Please refer to page 50 "Risk Management" for information on BCP initiatives.

### Promote CSR in Procurement

Fuji Electric believes that it is important to aim to be a company with high social value by working with our suppliers to fulfill our corporate social responsibility (CSR).

In fiscal 2012, we formulated the Fuji Electric Procurement Guideline, Green Procurement Guideline and CSR Procurement Guideline in order to share our corporate philosophy, procurement policies, and CSR approach with our suppliers. Moreover, we revised our CSR Questionnaire for suppliers and clarified the issues that we should tackle together with them.

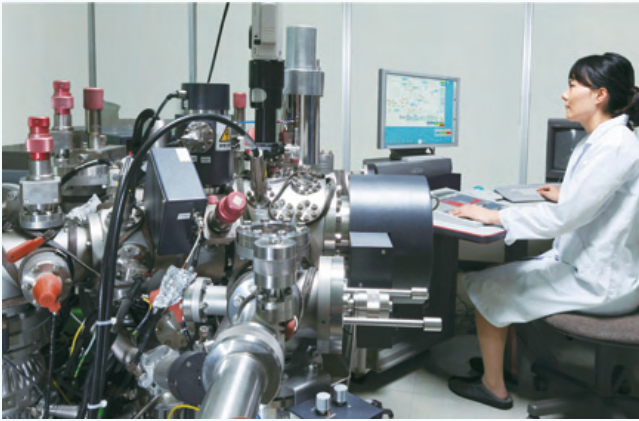
In fiscal 2013, we will conduct a CSR Questionnaire for key suppliers, and work on a global basis to further promote CSR.

#### Conflict Minerals

Fuji Electric has a policy of not supporting acts that violate human rights through its suppliers. Based on this policy, we have worked to ban the use of minerals associated with the funding of armed insurgents, human trafficking, forced labor, child labor, abuse, war crimes, and other human rights violations. These minerals include tin, tantalum, tungsten, gold and its derivatives produced in the Democratic Republic of the Congo or areas of conflict in surrounding countries.

# Research and Development

With its core technologies in power semiconductors and power electronics, Fuji Electric is focusing R&D on products and systems that effectively and stably provide and use electricity and thermal energy.



## R&D Policies

- Expand and strengthen core technologies through synergies between our main fields of power semiconductors and power electronics
- Expand solution technologies that utilize distinctive sensor, control, information, and communications technologies
- Globalize R&D activities and promote open innovation

## Primary Initiatives

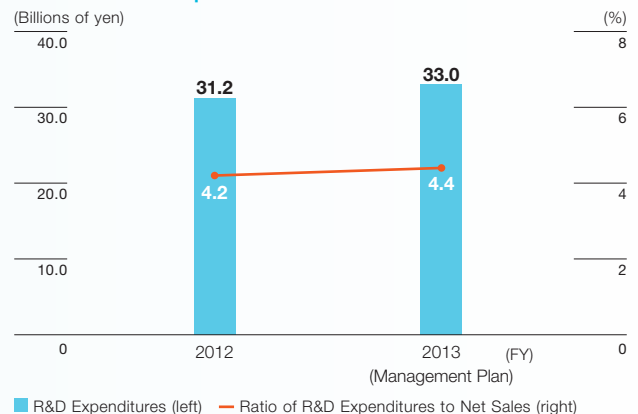
### Strengthen Core Technologies in all Aspects and Develop New Products and Materials

In addition to bolstering our core technologies, such as power semiconductors and power electronics, and developing distinctive components and systems, Fuji Electric is working to develop new products that generate Company-wide synergies (thermal, machinery, control).

As an example, we have developed a next-generation power semiconductor SiC (silicon carbide) device which will reduce energy use in a wide range of industrial sectors. We are also accelerating the development of power electronics equipment that apply this SiC device, such as power conditioners and uninterruptible power supply devices.

Furthermore, in addition to thoroughly enhancing our control and sensor technologies, we are pursuing synergies in the research and development of energy management technologies and heat-related technologies.

### R&D Expenditures/ Ratio of R&D Expenditures to Net Sales



### Promote Open Innovation and Globalization

Fuji Electric is speeding up product development through joint research with research institutions and universities. In Japan, the development of the SiC device has been a joint effort with the National Institute of Advanced Industrial Science and Technology (AIST). Meanwhile, we have partnered with a number of key Japanese universities to work on R&D that will lead to next-generation technologies.

In the U.S., Europe, and China, we are establishing research centers and developing partnerships between academia and industry. We have worked with China's

Zhejiang University to establish the Fuji Electric Innovation Center, where new businesses are being created and new products developed.

We are working to develop products that meet local needs, with a view to rolling them out in global markets, particularly in China and other parts of Asia. We are strengthening our initiatives to develop power electronics equipment and other key products, with the aim of having local design, parts procurement, and production functions in Thailand, China, and other overseas production sites.

## R&D Results in Fiscal 2012

### Results of Trial Demonstration in Kitakyushu Smart Community

Fuji Electric is a participant in the Kitakyushu Smart Community Creation Project, and is testing the optimal control of energy with a cluster energy management system (CEMS). From fiscal 2012, we conducted the first test in Japan of a system that changes the unit price of electric power according to demand, and found that the amount of electricity used declined by more than 16% (figures released by Kitakyushu City).



### SPH3000MG Controller Achieves Both High-Speed and High-Precision

Fuji Electric developed a controller device that allows for high-speed, high-precision control of large amounts of data, centering on the area of steel plant control. The controller delivers high-speed communication processing performance, and can control multiple production line devices. By increasing the production line control accuracy for steel plant equipment, it contributes to improved productivity.



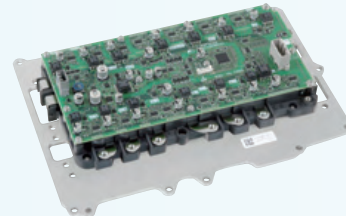
### FRENIC-Ace Series Inverters for Overseas Markets

Fuji Electric developed a new series standard class inverter for markets in Asia, China, and Europe. Customers can select the optimal capacity specification from four types (there were previously one or two types) depending on the conditions of use. Among other features, these high-performance, multifunctional inverters can have customized software built in and can drive synchronized motors to adapt them for special applications such as wire drawing machines or hoisting cranes.



### Intelligent Power Module for Plug-in Hybrid Vehicles

Fuji Electric developed an intelligent power module (IPM) which helps make plug-in hybrid and full hybrid vehicles more efficient and use less fuel. By raising the heat radiation efficiency of power semiconductors, we packaged two inverter parts and one converter part together to achieve a module that is smaller, and delivers up to 400 kVA of output.



\* Please see the Fuji Electric Journal on our corporate website for more information on our latest technological developments.

Voice

## Word from a Joint Development Partner: The National Institute of Advanced Industrial Science and Technology



**Hajime Okumura**  
Director  
Advanced Power  
Electronics Research  
Center of the National  
Institute of Advanced  
Industrial Science and  
Technology

The National Institute of Advanced Industrial Science and Technology (AIST) conducts research in a variety of fields that support Japanese industry. To industrialize basic research achievements, we conduct joint research with companies that have experience in manufacturing. We have positioned the utilization of the next-generation power semiconductor SiC as an important theme, and in 2009 we began joint research with Fuji Electric based on the achievements of prior basic research. We are currently working to bring it to practical use, and in 2012 we developed the practical low-loss SiC-MOSFET. Going forward, we want to apply this technology to power electronics equipment, and use it to help conserve energy around the world.

# Intellectual Property

In response to the globalization of our business, Fuji Electric, based on respect for both the intellectual property (IP) rights it owns as well as those owned by other companies, is working to implement IP strategies that are aligned with our business and R&D strategies. By advancing these initiatives, Fuji Electric will continue to strengthen and expand its business globally.



IP training conducted at Fuji Electric (China) Co., Ltd.

## IP Policies

- Comprehensively strengthen patent portfolio in consideration of business and R&D resources
- Investigate and respond to overseas IP systems and status
- Reinforce IP activities at overseas bases

\* Patent Portfolio: A group of patents strategically acquired in relevant technical fields with the goal of securing leeway in business fields, avoiding litigation, and establishing a competitive advantage.  
Source: Nomura Research Institute, Ltd.

## Major Initiatives in Fiscal 2012

### IP Activities in Consideration of Business and R&D Resources

For key research themes and products and materials, the IP divisions worked with the business group and the R&D group to strengthen the patent portfolio. Also, efforts were focused on filing patent applications, centered on businesses related to energy and power electronics.

#### Main Fields for Patent Applications

- Patents relating to increasing the efficiency of power electronics products and saving energy
- Patents relating to semiconductors such as SiC-related technologies
- Patents relating to vending machines

## Global IP Activities

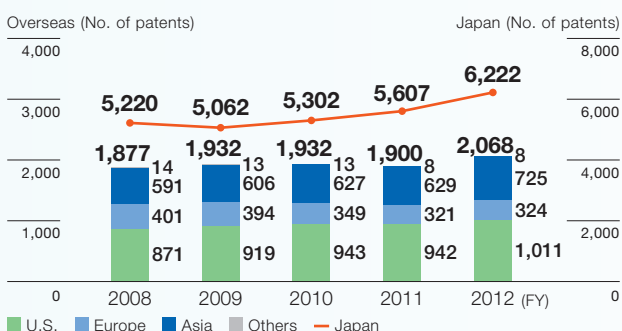
In order to reduce our business risks related to IP on a global basis, we research overseas IP systems and develop countermeasures to handle counterfeit products.

In fiscal 2012, after conducting these activities in China, we researched the latest IP systems in Southeast Asia and India, where we are strengthening our business. Moreover, in addition to working on countermeasures against counterfeit products, including exposing counterfeit product factories in China, we gathered IP information on China through the activities of the Intellectual Property Committee

of The Japanese Chamber of Commerce and Industry in China. Furthermore, we increased the number of patent applications filed overseas in conjunction with the globalization of our business.

Going forward, we will continue to build a patent portfolio that will give us an absolute business advantage, and avoid business risks with respect to other companies' patents. We will also aggressively utilize patents in areas such as licensing and collaboration.

### Number of Patents Held by Country and Region



### Number of Patent Applications by Country and Region

