

Power Electronics Industry Business Strategies

May 30, 2022

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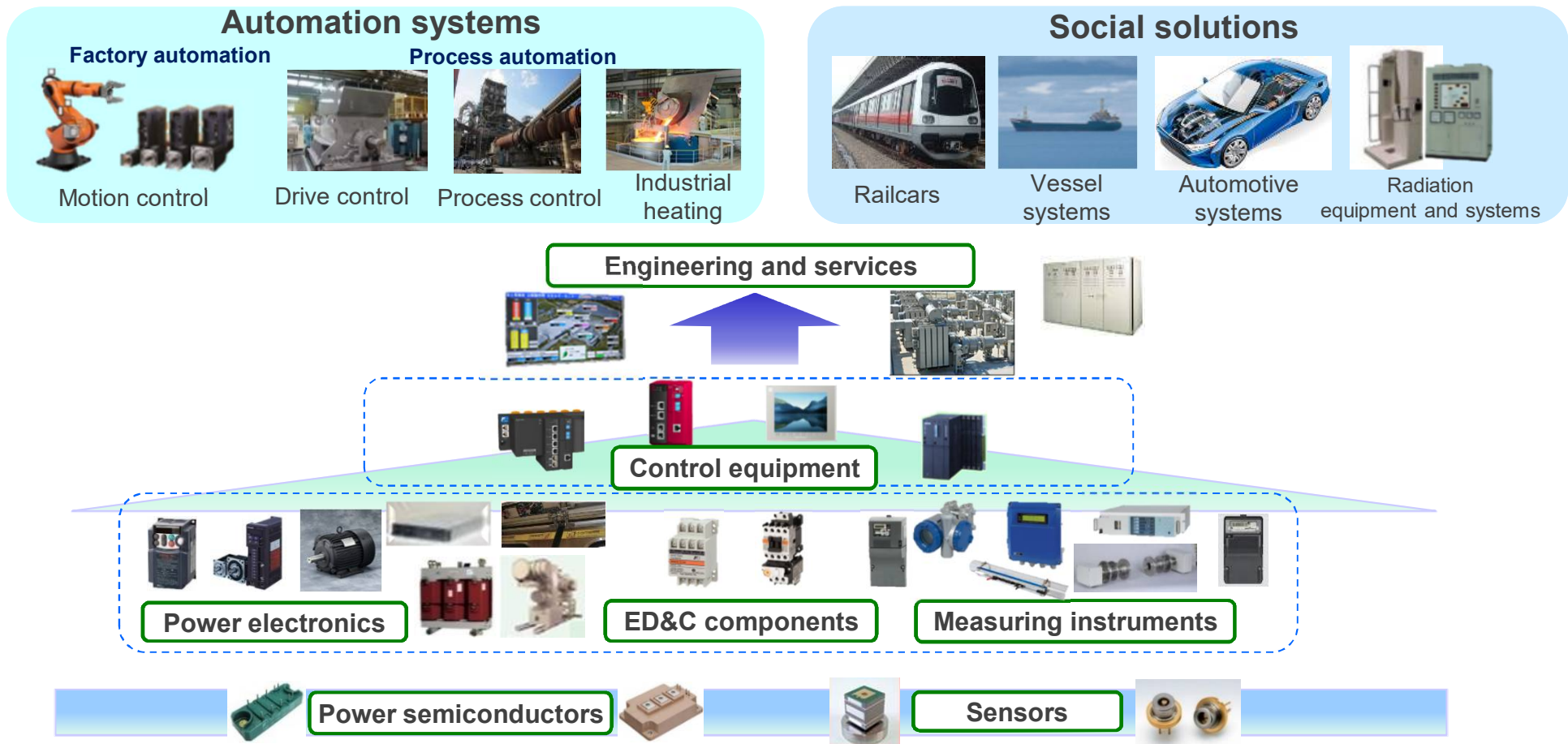
Power Electronics Industry Business Group

Fuji Electric Co., Ltd.

- Business Policies / Business Overview
- Progress under Medium-Term Management Plan
- FY2022 Management Plan
 - Market Outlook
 - Business Plan
 - Priority Measures
 - Capital Investment / Research and Development

Automation and energy saving through business of Power Electronics Industry segment

Creation of competitive components, enhancement of systems using competitive components, and expansion of overseas businesses by leveraging systems



Net sales
¥324.1 billion
(FY2021)

Automation Systems

51%
of total net sales

Social Solutions


12%

Equipment Construction 20%


IT Solutions 17%

Realizing productivity improvements and energy savings through factory automation and visualization


No. 2* domestic share




Low-voltage inverters




Small motors



Small-capacity power supplies




Measuring instruments and sensors




Smart meters

No. 2* domestic share




(Servos)




(Controllers)

Factory automation components




Testing apparatuses




Production equipment


No. 1* domestic share




Industrial inverters




Drive control systems




Medium-voltage inverters




Induction furnaces



Medium-sized motors



Process control systems



DCS systems

No. 1* domestic share



(Electrical equipment for railcars)

Transportation systems



(Passenger door systems)



(Electric propulsion systems)

Ships



(Onshore harbor power supply systems)



(Monitoring posts)

Radiation monitoring systems

Plant equipment, air-conditioning, and construction

Information systems

Major Customers Industries

- Factory Automation**
- Assembly plants (automobile, electric/electronic equipment)
 - Air-conditioning, water treatment facilities
 - Industry machinery
 - Power companies, public power utilities

- Process Automation**
- Material plants (steel, nonferrous metals, chemicals)
 - Waste treatment plants
 - Cranes

- Social Solutions**
- Railways
 - Shipbuilders, ports
 - Electricity

- Equipment Construction**
- Material plants
 - Data centers
 - Solar power generation equipment, etc.

- IT Solutions**
- National and municipal government agencies, schools

Notes:

1. Total net sales, percentages of total net sales and share (based on Fuji Electric's estimates) figures represent FY2021 results and are calculated before deduction and adjustment for inter-segment sales.

2. In FY2022, the following changes to subsegments were implemented.

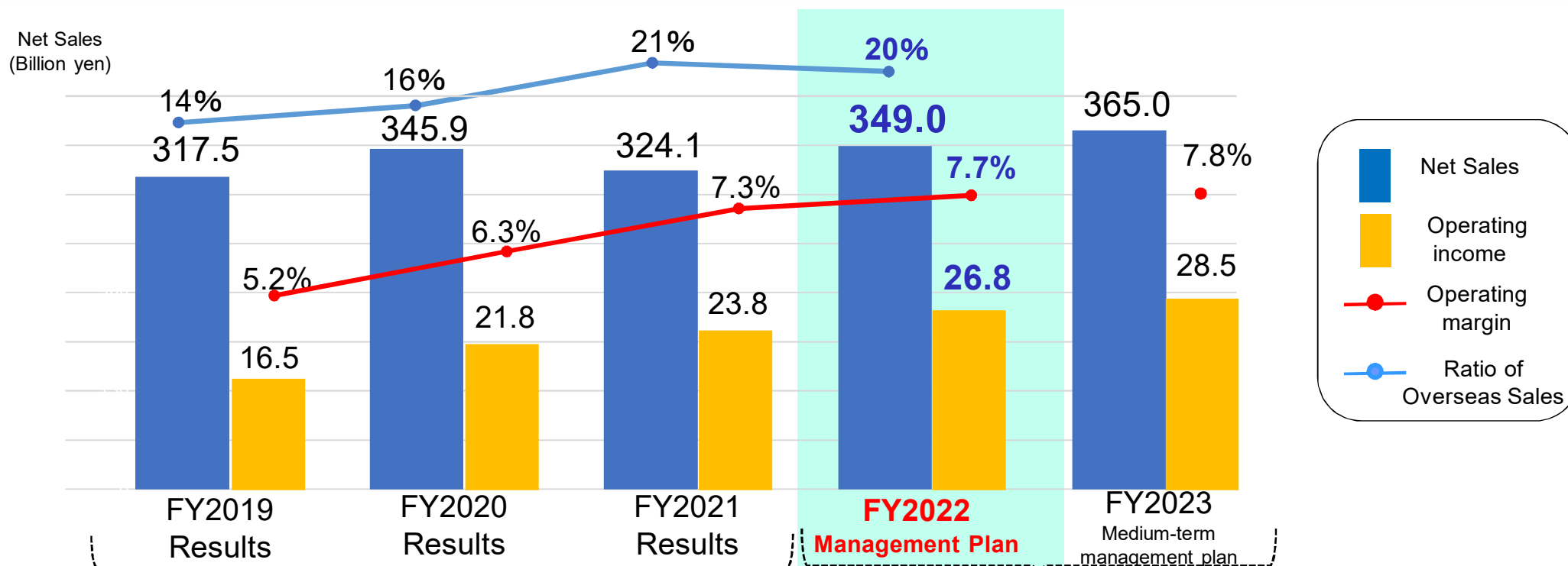
Smart meters were moved from the energy management business subsegment of the Power Electronics Energy segment to the automation systems business of the Power Electronics Industry segment.

Power conditioning systems were moved from the automation systems business subsegment of the Power Electronics Industry segment to the energy management business subsegment of the Power Electronics Energy segment.

Renewable energy-related products were moved from the social solutions business subsegment of the Power Electronics Industry segment to the energy management business subsegment of the Power Electronics Energy segment.

Progress Under Medium-Term Management Plan

Steady growth of operating income projected to lead to FY2022 operating income in line with FY2023 target



Successes from FY2019–2021 (Three Years)

Strengthening of Constitution of Component Businesses

- Development of platforms
→ Launch of New-MEGA series (March 2021)
- Augmentation of local design functions (Thailand, China, and India)

Growth of Overseas Operations Centered on China and Other Parts of Asia

















- Expansion of orders through enhancement of projects with partners in China and Vietnam
- Reinforcement of sales channels and production systems through integration with FCN in India

Challenges

- Further strengthening of constitution of component businesses
- Growth of overseas operations
- Response to new trends (carbon neutrality, digital transformation)

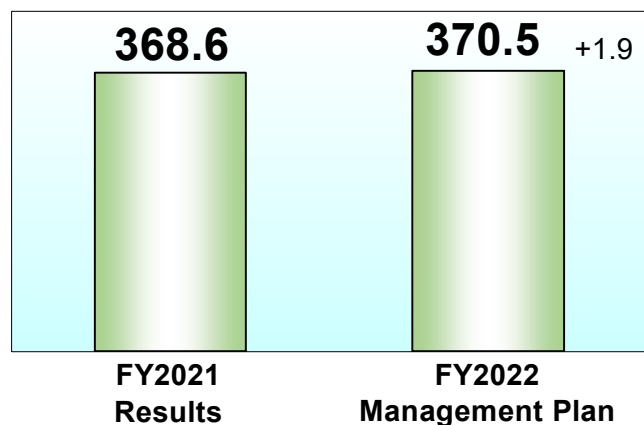
Note: Figures for FY2021 performance reflect the business reorganization undertaken in the FY2022.

FY2022 Market Outlook

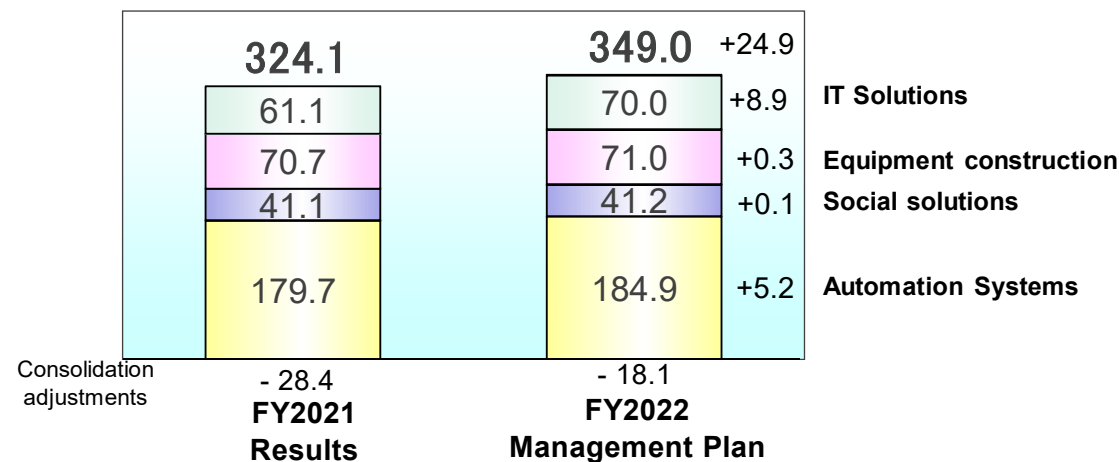
		Market Outlook (FY2022)			
		FY2020 to FY2021	FY2021 to FY2022	Details	
Automation Systems	Components	Japan			Strong demand for semiconductors and machine tools , despite uncertainty in overseas export projects due factors such as lockdowns in China Continuation of investment in productivity improvements and automation expected in domestic market
		Overseas			Lingering risks related to sales volumes declines stemming from semiconductor component shortages and prolonged lockdowns in China , but higher demand in Southeast Asia and India as a whole due to ongoing recovery from impacts of COVID-19 pandemic
	Systems	Steel (Japan)			Moderate increase in sales to industrial and construction equipment sectors in FY2022 stimulated by improvements in capital investment; strategic investment and productivity improvement investments centered on EVs anticipated in automotive sector
		Chemicals (Japan)			Strong investment in highly functional products, high-value-added products, and other growth fields Continuation of upgrade demand for purposes of maintaining quality and improving productivity
		Waste (Japan)			Consistent demand for upgrading aged equipment and reforming core systems
		Railcars (Global)			Upgrade demand and investment targeting quality improvements underway despite contraction of new projects
Social Solutions	Ships (Global)			Growth of market for eco-friendly products to support carbon neutrality initiatives (ship electrification, port decarbonization, etc.)	
	IT Solutions	Information (Japan)			Higher demand in conjunction with digitization by national and municipal government agencies, more widespread teleworking, and revision of act on electronic account management anticipated together with new demand in industrial digital transformation market

- Steady promotion of measures for achieving targets of FY2023 medium-term management plan
- Ongoing reinforcement of business constitution and acceleration of R&D

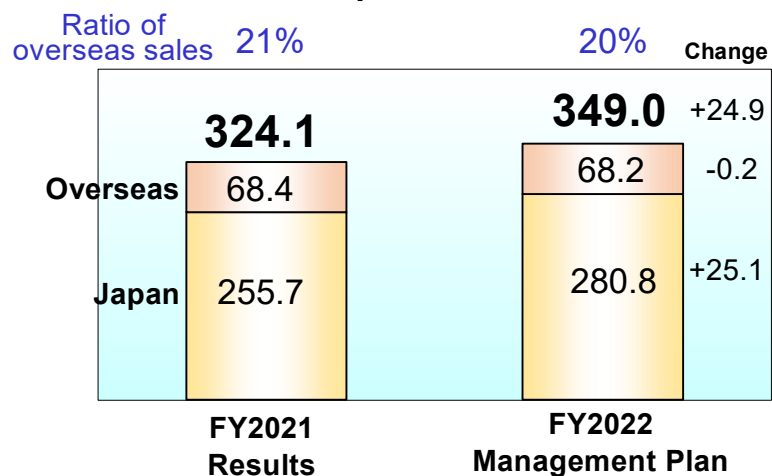
Amount of Orders Received (Billions of yen) **Change**



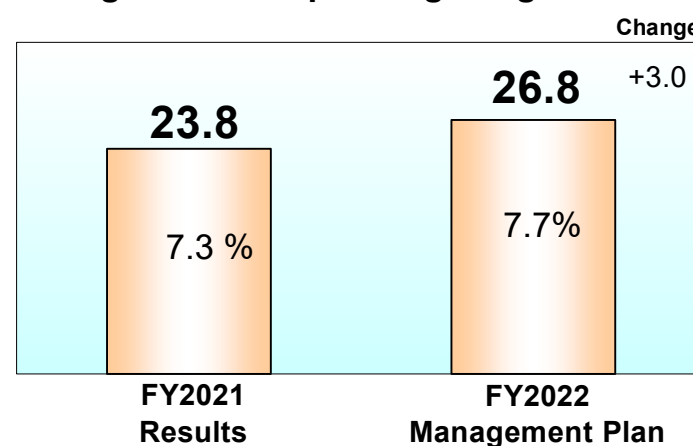
Net Sales (Billions of yen) **Change**



Net Sales in Japan / Overseas (Billions of yen)



Operating Income / Operating Margin (Billions of yen)



Automation Systems

- ◇ **Strengthening of component business constitution**
 - Reinforcement of local production, consumption, and design functions (development of structure encompassing six areas of the world)
 - Promotion of platform development and increased component substitution
- ◇ **Expansion of overseas system businesses using competitive components**
 - Growth of overseas operations driven by new global products (China, other parts of Asia, and India)
- ◇ **Expansion of plant operations through comprehensive equipment orders**

Social Solutions

- ◇ **Growth of global businesses through differentiated products (railcars, ship systems)**
 - Acceleration of business growth through platform development while maintaining reliability and quality in regard to railcars
 - Exploration of new vessel system markets (electric propulsion, onshore power supplies)

IT Solutions

- ◇ **Growth of sales through digital solutions**
 - Expansion of IT solutions business, which contributes to customers' digital transformations

Development

- ◇ **Creation of competitive components**
 - Improvement of development efficiency and swift introduction of new products

Promotion of local production, consumption, and design in six areas of the world
(Japan, China, Thailand, India, Europe, and the Americas)
Improvement of component profitability and competitiveness

- ◆ FY2022: Expansion of range of models produced in India and Europe
- ◆ FY2023: Completion of structure encompassing six areas of the world through installation of functions in the Americas



- Improvement of profitability by using shared components through platform development
- Utilization of local design functions to adopt alternative components and reduce costs of sales (design costs)

■ Promotion of Transition to Next-Generation Series

【Current Series】

(Low-voltage inverters)

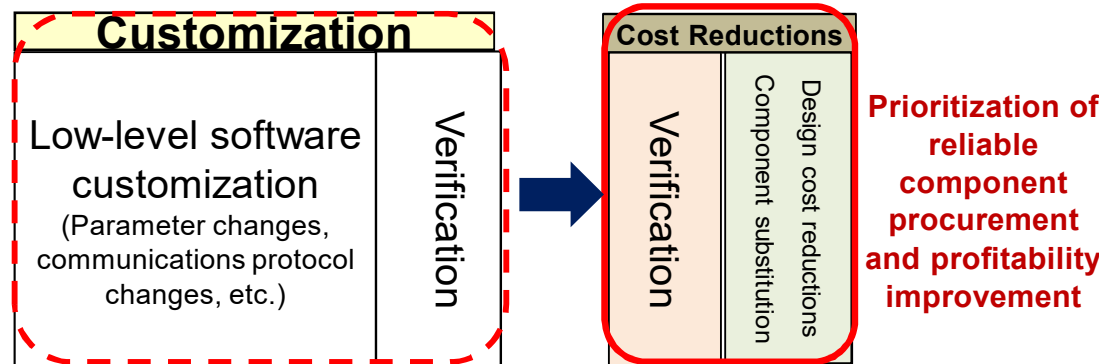
Series	MEGA	Eco	Lift	Mini	Ace	VP	Total: 122
Type	High performance	Fan pump	Elevator	Miniature, multipurpose	Multi purpose	Fan pump	
No. of models	36	37	13	5	31		

【Next-Generation Series】

Series	N-MEGA	N-Eco	N-Lift	N-Mini	N-Ace	N-VP	No. of models
No. of models	35			14			Total: 49
	Standard platform			Compact platform			Target for FY2023

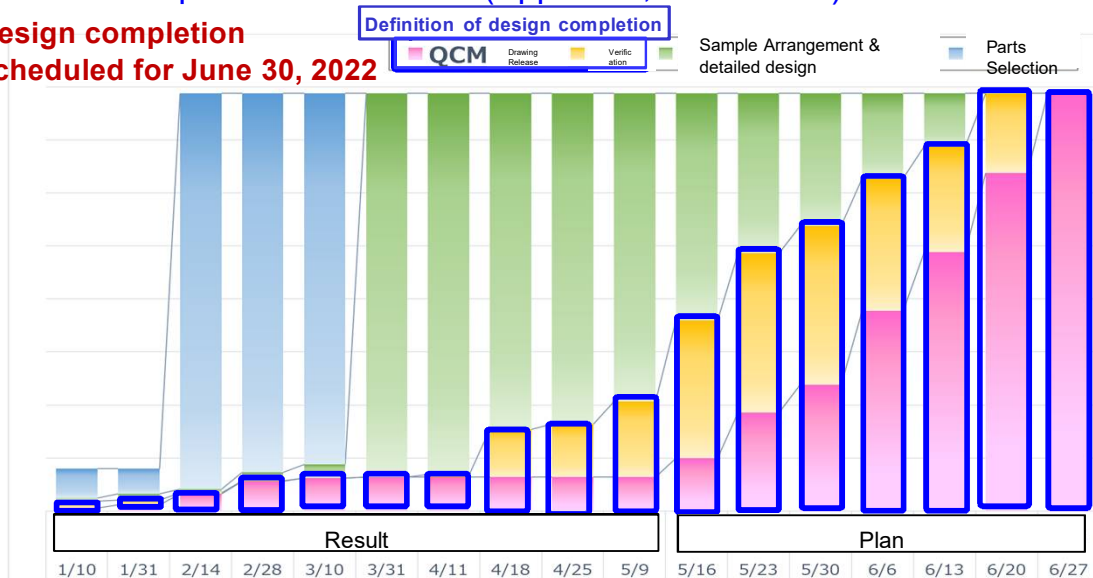
■ Utilization of Local Design Functions to Accelerate Component Substitution

WUFE: Focus on design cost reductions and component substitution



Progress in Component Substitution (Approx. 1,000 Models)

Design completion scheduled for June 30, 2022







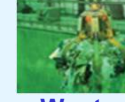

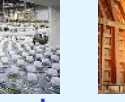





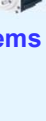












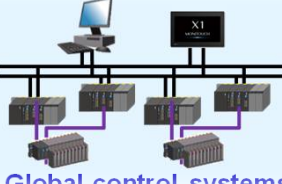




Effect by shared components

- Improvement of profitability
 - Reduction of procurement and production costs and material inventories
- Acceleration of component substitution

Ratios of models using platforms (as of March 31, 2022)

Low-voltage inverters: 44%; measuring instruments: 36%; railcars: 36%

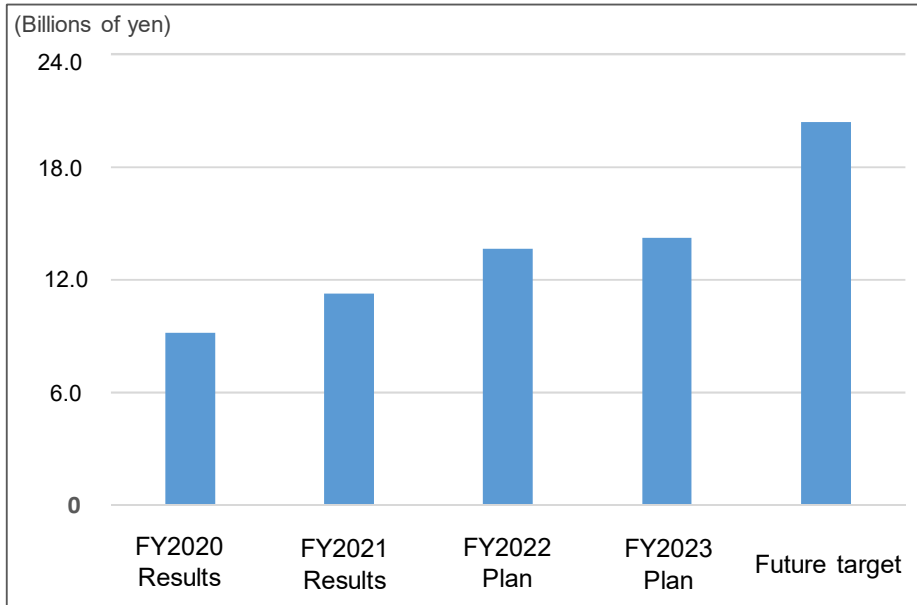
		China	Southeast Asia	India	
Net Sales		¥19.4 billion → ¥24.6 billion → ¥19.1 billion (FY2020) (FY2021) (FY2022 Plan)	¥21.0 billion → ¥26.9 billion → ¥31.9 billion (FY2020) (FY2021) (FY2022 Plan)		
Target industries		 Electricity  Steel  Ports  Equipment manufacturers	 Chemicals  Cement  Waste treatment  Food and beverages  Steel  Ports  Solar power  Equipment manufacturers		
Automation Systems	F A	Measures	<ul style="list-style-type: none"> Enhancement of procurement risk management Exploration of new industries through approach toward focus areas (laser processing machines, batteries, 3C*) 	<ul style="list-style-type: none"> Reinforcement of factory automation operations HVAC sales through promotion of spec-in activities to consultants 	<ul style="list-style-type: none"> Expansion of sales and acceleration of local production of new products
		Products	 Low-voltage inverters  Servo systems  Human-machine interfaces  Motors  Measuring instruments	 Low-voltage inverters  Servo systems  Measuring instruments	<div style="border: 2px dashed red; padding: 5px;">  Low-voltage inverters  Servo systems  Measuring instruments  Compact power supplies (mini UPSs) </div>
	P A	Measures	<ul style="list-style-type: none"> Utilization of sales channels of joint venture in Shanghai to acquire orders for medium-voltage inverters and systems Promotion of global induction furnace sales 	<ul style="list-style-type: none"> Sales Promotion of global control system Acceleration of efforts to acquire harbor crane orders 	<ul style="list-style-type: none"> Utilization of FCN's sales channels Approach toward new industries driven by enhancement of local customization capabilities
		Products	 Medium-voltage inverters <div style="border: 2px solid red; padding: 5px; display: inline-block;">  Global induction furnaces </div>	 Medium-voltage inverters <div style="border: 2px solid red; padding: 5px; display: inline-block;">  Global control systems </div>	 Inverter boards <div style="border: 2px solid red; padding: 5px; display: inline-block;">  Global control systems </div>

* 3C : Computer, Communication(mainly for smart phone), Consumer Electronics(home electrical appliance)

Growth of Overseas Operations Driven by New Global Products

Promotion of global compatibility for core products
(control systems, drives, industrial heating)

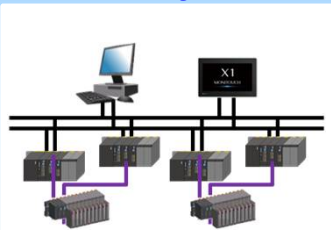
Overseas Sales in Process Automation Business



Note: Above figures are for drive control systems, instrumentation control systems, and industrial heating systems.

Global Products

Control system Industrial inverter Induction furnace



Launched in FY2022



Scheduled for launch in FY2024



Launched in FY2020

Measure 1: Expansion of Completely Localized Plant Businesses

Sales promotion strategy:

Development sales, engineering, and manufacturing networks and global products

★Resolution of remaining issues related to development of sales systems and acquisition products that can compete in overseas markets



■Sales systems: Establishment of local sales systems and acceleration of coordination with partners

■Products: Introduction of global products that can more easily penetrate overseas markets

Global control systems: Integrated engineering tools emphasizing ease of use
Global industrial inverters: Inverters that can be used by anyone, anywhere

Measure 2: Growth of Induction Furnace Operations

Sales promotion strategy:

Introduction of differentiated products matched to market changes

★Progress in transition to electric induction furnaces that emit little CO₂ during melting, but issues related to rising power demand



Utilization of core power electronics and analytical technologies to propose solutions to customer issues with global induction furnace products boasting increased efficiency

Expansion of comprehensive equipment orders and improvement of engineering quality in response to changes in customer needs

Major Needs of Domestic Customers

- Equipment consolidation
- Response to aging facilities
- Alleviation of human resource shortages
- Reduction of operating costs
- Expansion of IT investments
- Reinforcement of security

【Comprehensive Equipment Orders】

One-stop support for electric equipment, measuring instruments, information systems, engineering, and services

【System Quality Improvement】

Improvement of system quality through enhanced testing equipment and standardization Plant system building in Tokyo Factory (completed in 2021)

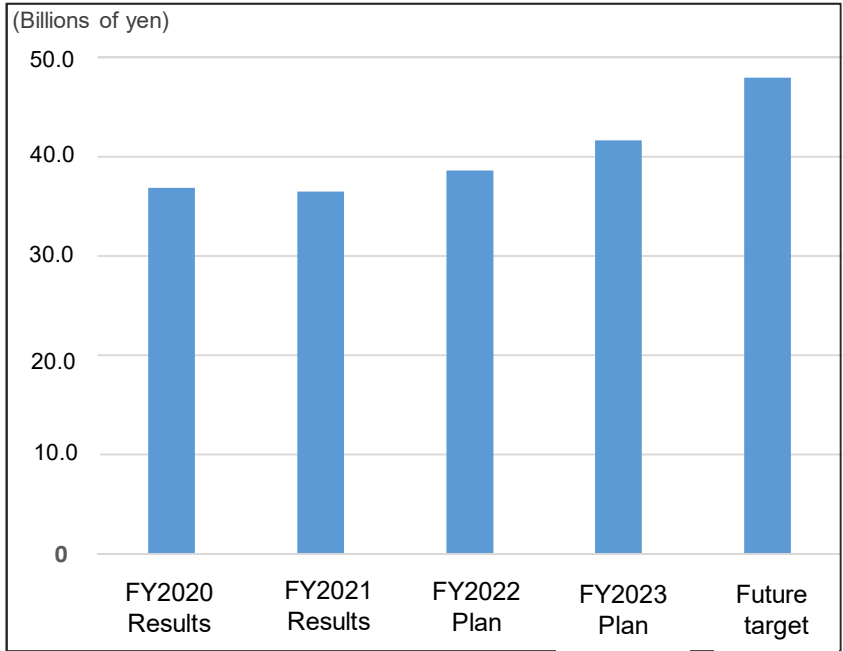


■ Example of Comprehensive Equipment Orders Received in FY2021

Order from Cement Manufacturer

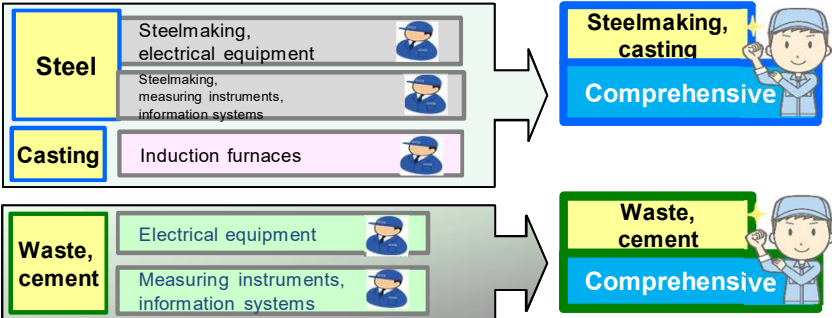
- Overview: Medium-voltage substation equipment, motion control centers, inverter boards, electrical equipment, and measuring instruments
- Major points: **Fuji Electric approached by customer based on high evaluation of past orders filled for similar plants (electrical equipment, measuring instruments, and construction); track record of deliveries to 11 of customer's 30 domestic cement plants**

■ Domestic Process Automation Sales Target



Note: Above figures are for drive control systems, instrumentation control systems, and industrial heating systems.

One-stop support coupled with improved system quality
→ Contributions to swift start of operations and stability at customers' plants

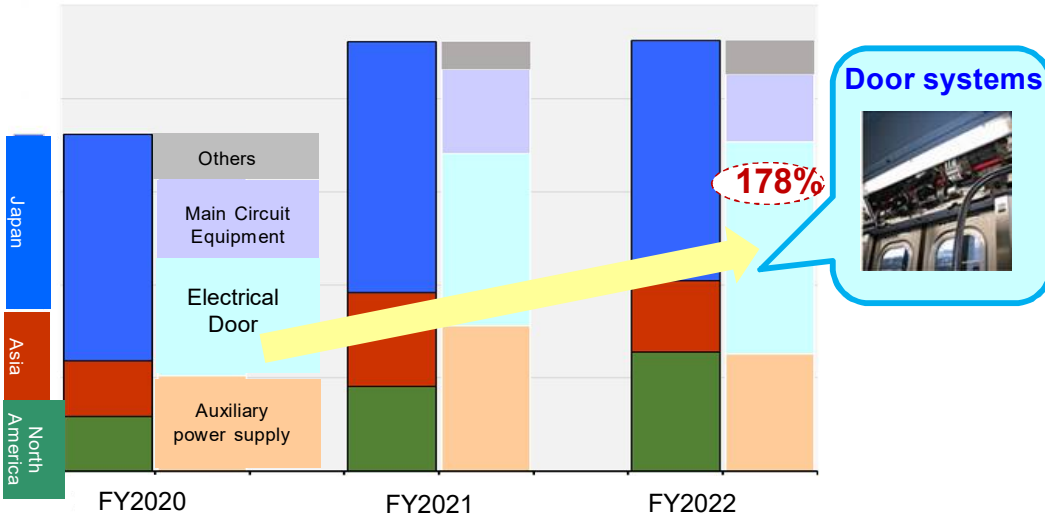


Plant system building

Growth of Businesses through Differentiated Products (Railcars)

Acceleration of business growth through development of railcar door system platforms

Net Sales by Region and Product



■ Changing customer needs

1. Simplified maintenance processes
2. Increased expectations for safety and reliability

● Strengths of Fuji Electric's Electric Door Systems

1. Simplified maintenance

- Lack of need for air pipes simplifying installation, maintenance, and inspection processes
- Low-friction design making for easy operation by hand during maintenance or in emergency situations

2. Safety and reliability

- Precise detection of objects stuck in doors
- Failure diagnosis functions driven by cutting-edge software technologies

● High Reliability Backed by Extensive Domestic and Overseas Operation Track Record

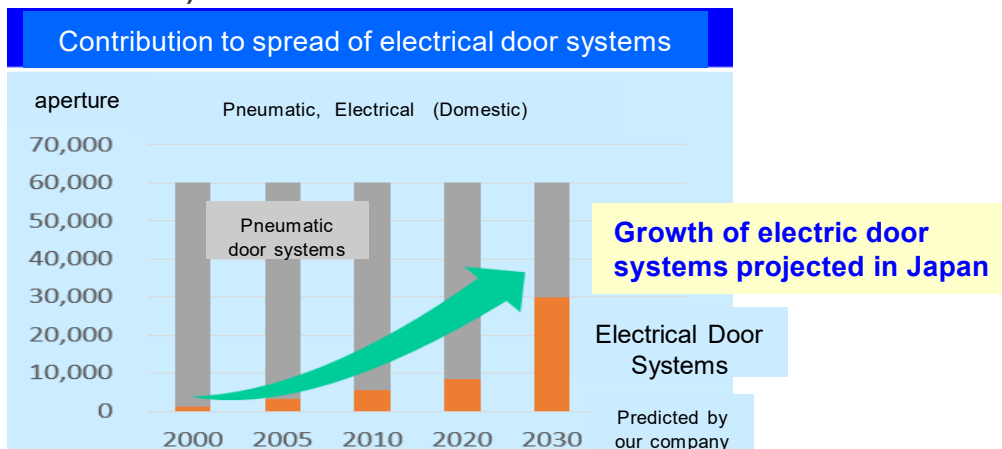
Standardization of highly reliable door systems (platform development)

- Order growth in Japan and North America



Market Trend of domestic door systems for railcars

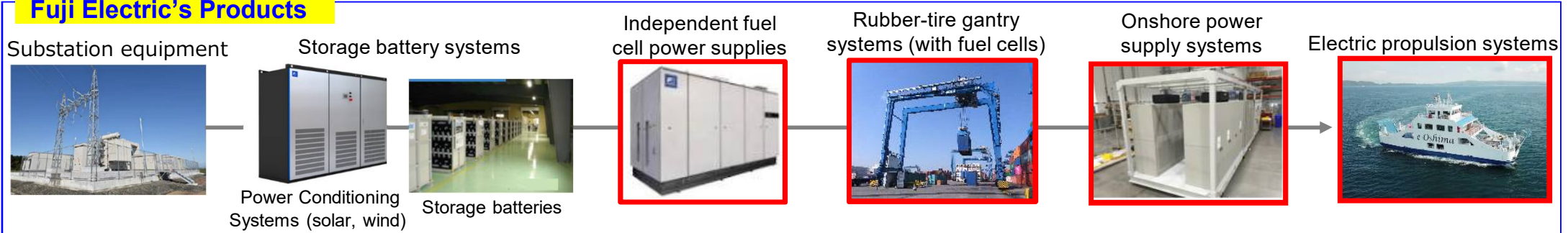
Pneumatic systems with simple structures resilient to issues becoming mainstream in Japan (electric systems remain mainstream in North America)



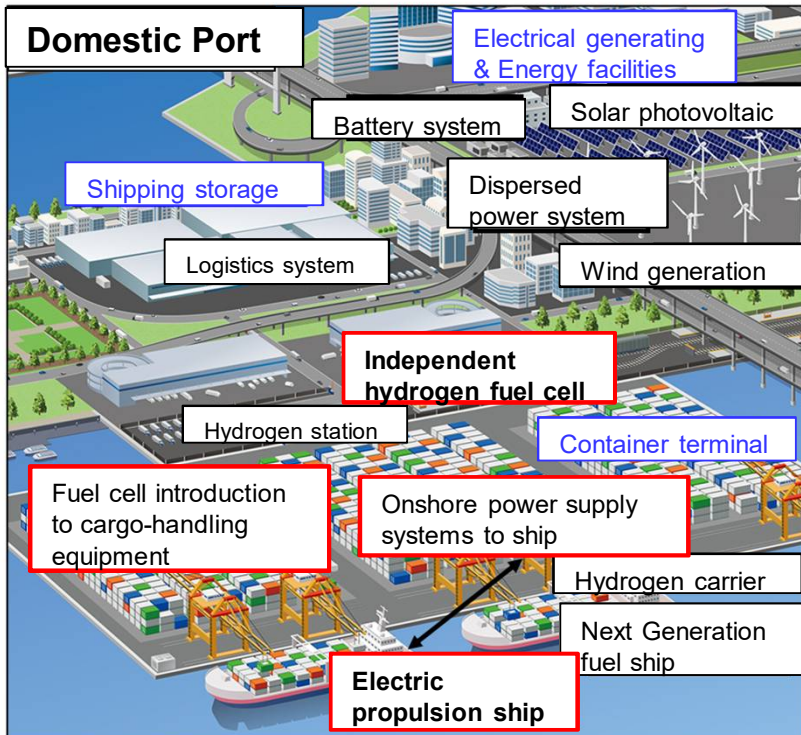
Growth of Global Businesses Using Differentiated Products (Vessel Systems)

● Carbon neutral port plan formulated in initiative spearheaded by Ministry of Land, Infrastructure, Transport and Tourism to promote decarbonization
 → Provision of comprehensive solutions on land and at sea spanning from substation equipment to electric propulsion systems

Fuji Electric's Products



Carbon Neutral Ports



Benefits and Fuji Electric's Strengths

Electric Propulsion Systems
 Onshore Power Supply Systems

Major Benefits

- Zero emissions made possible by batteries and hydrogen fuel cells
- Fewer units needed due to ability to detach only affected converters during failures

Fuji Electric's Strengths

- Track record of delivering commercial and military vessels (including Japan's first battery-powered vessel)
- Effective energy use made possible through DC systems

Major Benefits

- Reduction of greenhouse gas and other emissions from anchored vessels
- Ability to supply power from vessels after natural disasters (BCP measures)

Fuji Electric's Strengths

- Total planning encompassing ultrahigh voltage, renewable energy coordination, and electricity storage systems

Enhancement of responsiveness toward factory digital transformations, offices developed under the new normal emerging amid the COVID-19 pandemic, and digital transformation of government agencies

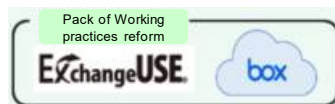
Factories

Integration of management and frontline operation
Combination of hardware and AI/IoT solutions

Offices

Telework solutions

(Digital technology legislation, digital transformation)

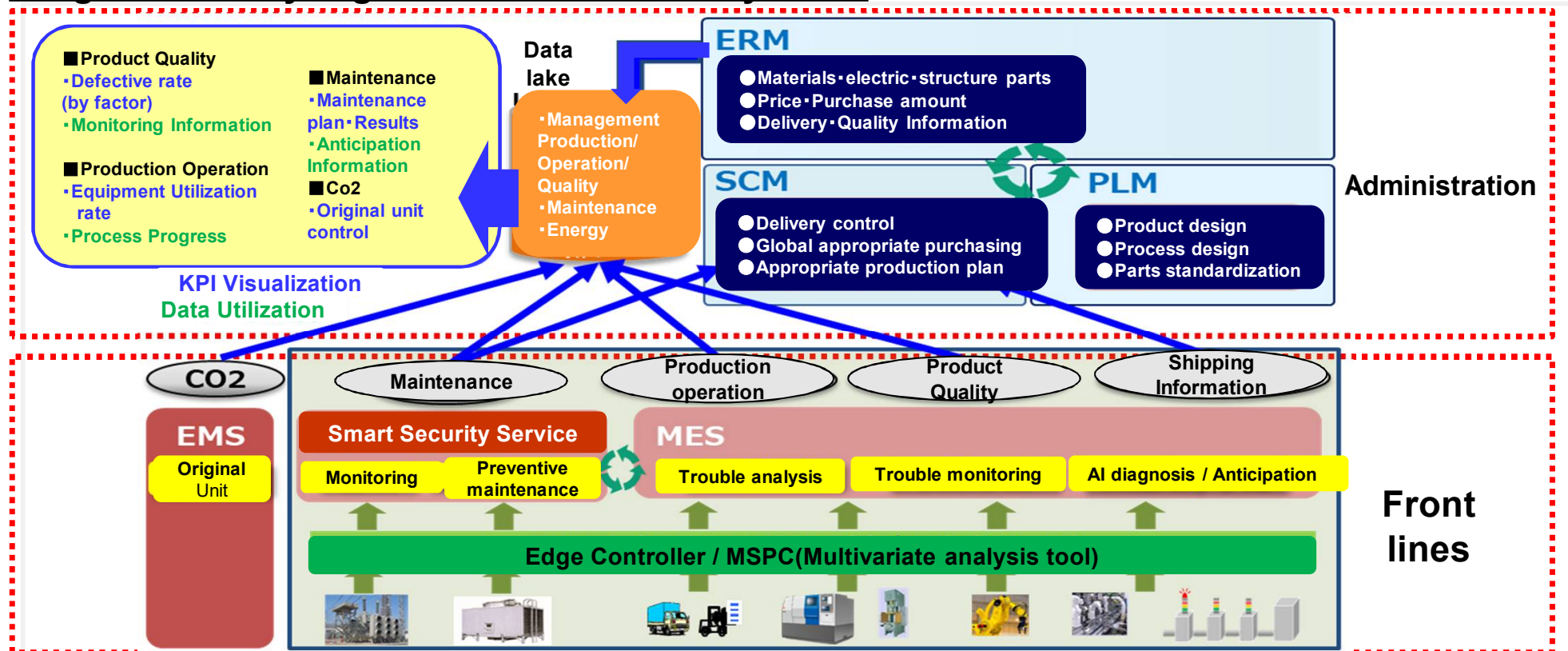


Electronic payment systems for government agencies

(Standardization promoted by Digital Agency)



Image of Factory Digital Transformation Systems

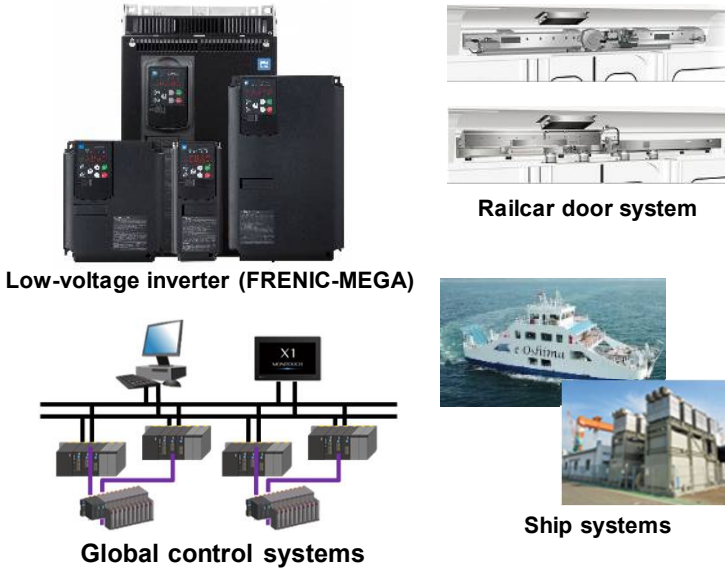


<Development> Creation of Competitive Components

Improvement of development efficiency and swift introduction of new products

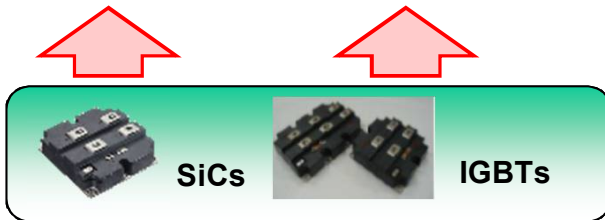
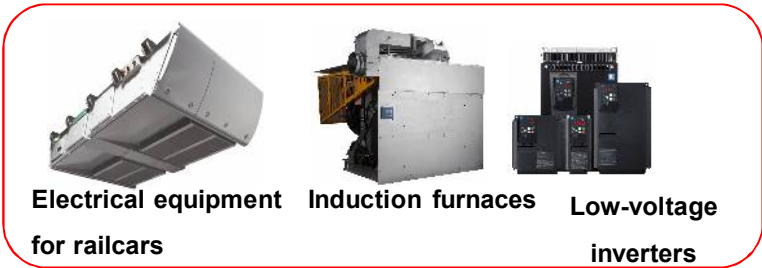
● Products for Global

★Launch (Scheduled commercialization)



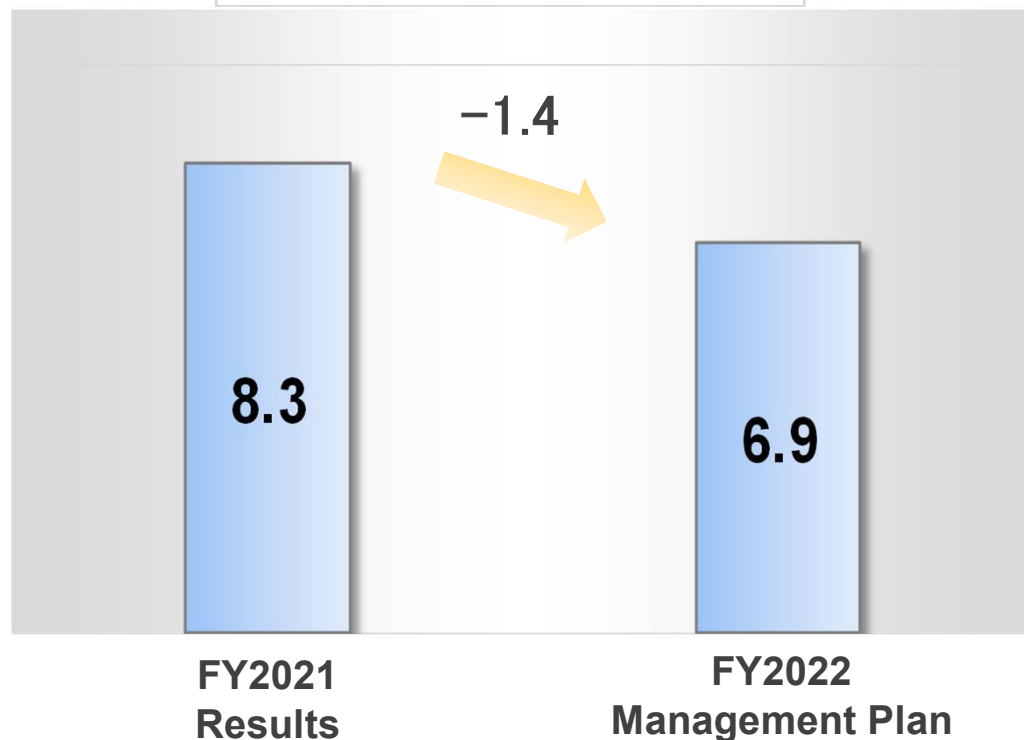
Sub segment	Product	Target Regions	FY2020	FY2021	FY2022	FY2023
Automation Systems	Low-voltage inverters • Component platform development, expansion of adopting models	Japan China Asia Europe North America	Component platform development, model deployment			
	Global industrial inverters • DC power systems adapted to plant applications • Compatibility with international specifications and standards	Japan China Asia	Platform development, model deployment			
	Global control systems • Engineering function enhancement • Easy and flexible system design	Japan Southeast Asia India	Platform development, model deployment	★	Series expansion	
	Global induction furnaces • Reduced energy consumption during production • Lower CO ₂ emissions	China Southeast Asia	Next-generation models			
Social Solutions	Electrical equipment for railcars (traction converters) • Compact, lightweight • Highly reliable	Japan	Series expansion			★
	Railcar door standardization • FCPM in Japan, linear in North America	Japan North America	Platform development, model deployment			★
	Ship systems • Onshore power supply systems • Electric propulsion systems	Japan India	Onshore power supply systems			★
			Electric propulsion systems			★ Transformers ★ Electric motors

● Fuji Electric Device-Equipped Products

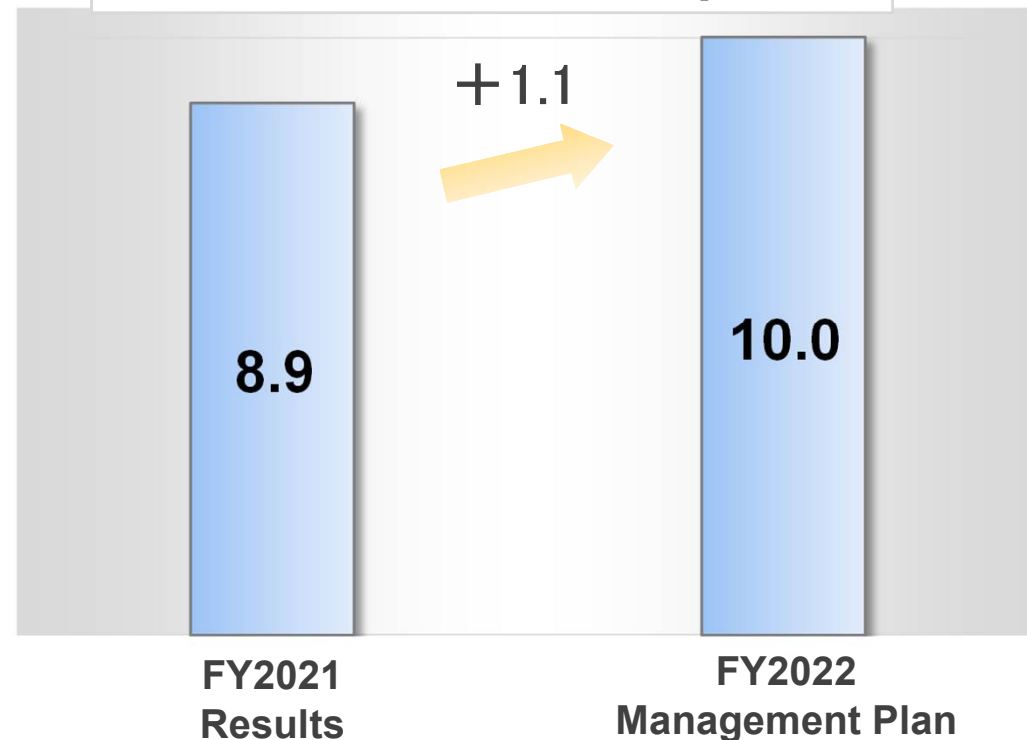


(Billions of yen)

Capital Investment



Research and Development



- **Forward-looking strategic investments**

Suzuka Factory: Construction of component logistics building (logistics rationalization through supply chain reforms)

India: Factory augmentation, expansion of range of products

General: Expansion of in-house production

- **Global plant and process automation products** (Global industrial inverters/control systems)
- **Mobility products**

Railcars: All-SiC devices, door system platforms
Vessels: Electric propulsion systems, onshore power supply systems

Note: The R&D expenditure figures above represent expenditures that have been allocated to segments based on theme and may therefore differ from figures contained in consolidated financial reports.

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