

Power Electronics Energy Business Strategies

May 30, 2023

Masashi Kawano

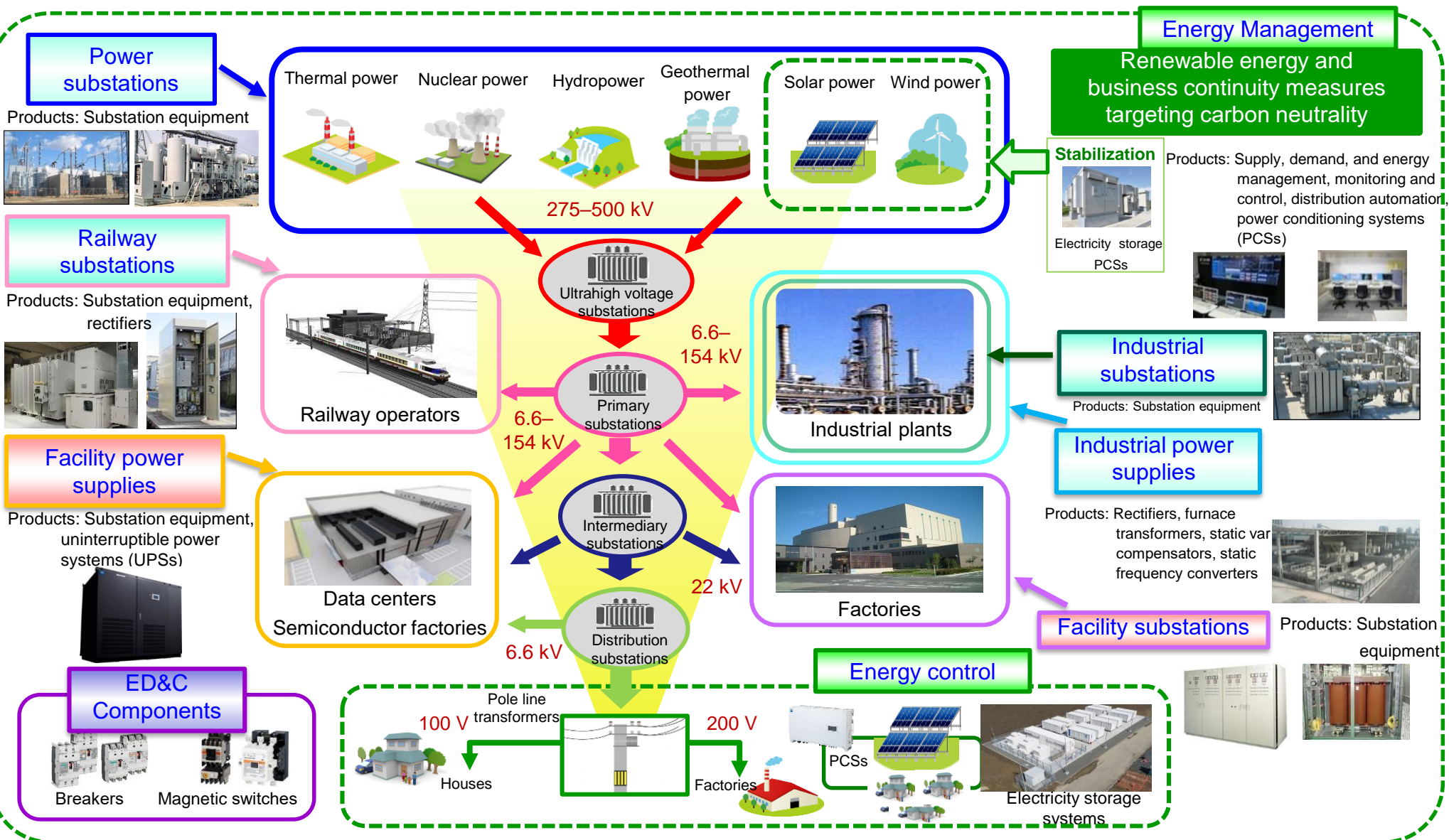
Managing Executive Officer

Corporate General Manager

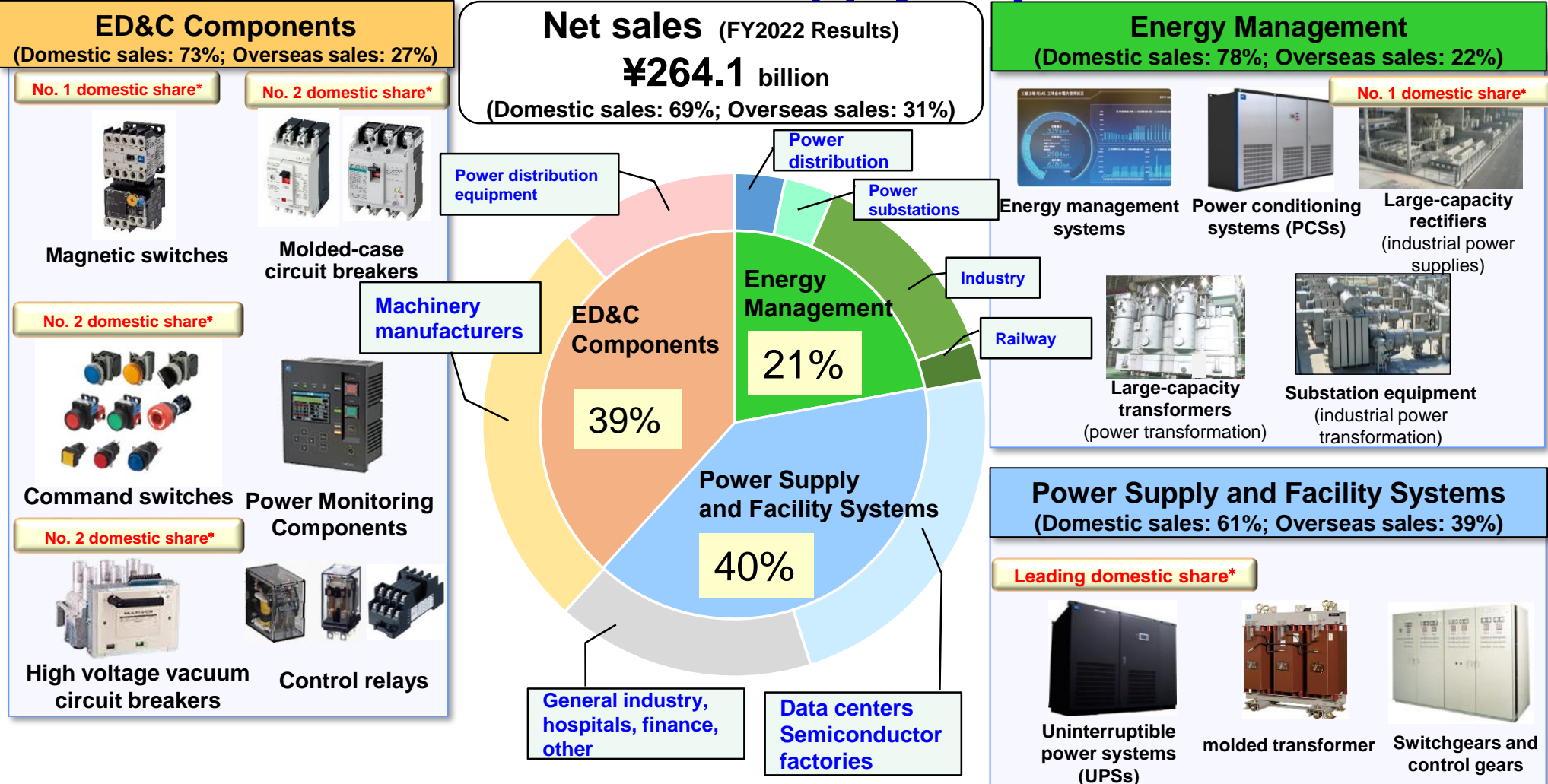
Power Electronics Energy Business Group

Fuji Electric Co., Ltd.

- Business Overview
- Performance
- FY2023 Management Plan
 - Market Outlook
 - Business Policies / Business Plan
 - Priority Measures
 - Capital Investment / Research and Development

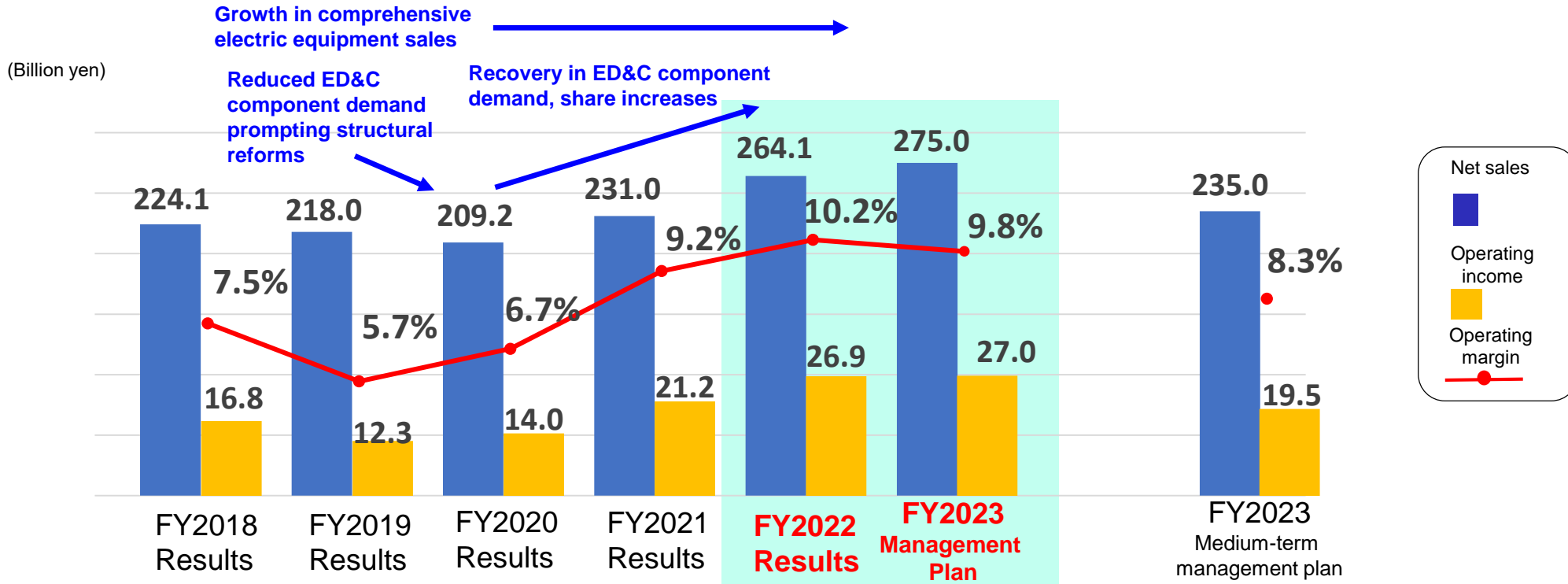


Contributions to stabilization, optimization, and reliable supply of power



* Shares represent estimates by Fuji Electric based on FY2022 performance.
Note: Percentages of total net sales figures represent FY2022 results and are calculated before deduction and adjustment for inter-segment sales.

Medium-term management plan income target achieved two years ahead of schedule, pursuit of higher sales and income in FY2023



















Results

- Ongoing orders from foreign internet data center operators and semiconductor companies
- Enhancement of manufacturing (standardization, in-house production, production rationalization)
- Improvement of profitability of ED&C components business

Challenges

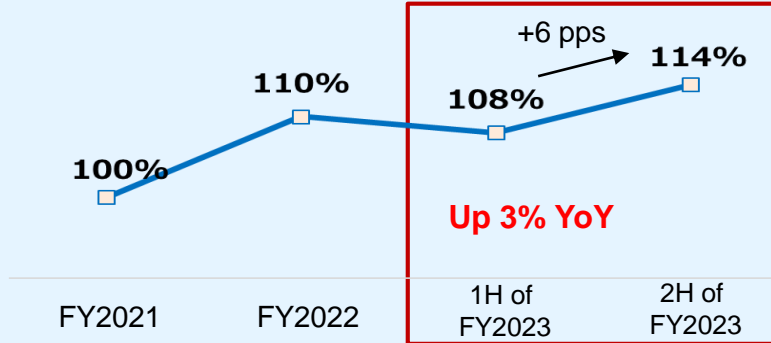
- Expansion of overseas businesses
- Response to delays in launches of new products
- Ongoing growth of market shares in ED&C components business

	Field	Japan / Overseas	YoY Change	Market Outlook (FY2023)
Energy Management 	Power distribution	Japan		Growth of markets for grid storage batteries and solar power generation systems for user in carbon neutrality field due to in part to government subsidies; advancement of multiple plans in regional microgrid field in areas on forefront of decarbonization and undergoing redevelopment
	Power	Japan		Increased capital investment related to next-generation energy and upgrade demand for addressing aging of large quantities of substation infrastructure installed during period of Japanese economic miracle; continuation of overall investment curtailments by power companies in light of performance downturns
		Overseas		Curtailment of substation investment in Asia, despite signs of recovery in power demand amid resumption of economic activities; acceleration of renewable energy introduction and other environmental measures in response to tightening of environment regulations and government policies
	Industrial	Japan		Increased capital investment in the manufacturing industry, mainly in steel and chemicals Also, strategic investment toward carbon neutrality is on the rise
		Overseas		Capital investment stimulated by YoY GDP growth in Southeast Asia countries anticipated
	Railway	Japan		Halts to performance downturns due to recovery of inbound demand amid resumption of economic activities Gradual recovery in capital investment anticipated for purposes of ensuring safe and reliable transportation
		Overseas		Progress in railway construction plans centered on Asian emerging countries, but slow resumption of plans due to delays in investment plans resulted from slowdown in economic activities
Power Supply and Facility Systems 	Facility Power supplies	Japan		Ongoing investment by foreign internet data center operators and favorable investment by domestic internet data center operators Strong performance in social infrastructure and subsidized projects
		Overseas		Strong growth anticipated in FY2023 centered on United States, despite reduced semiconductor demand, due to capital investment for building and augmenting cutting-edge semiconductor production facilities; recovery in global semiconductor market anticipated in FY2024
	Facility substations	Japan		Issues impacting memory affecting semiconductor investment, ongoing investment by machine tool manufacturers
		Overseas		Slowdown in semiconductor investment due to issues impacting memory; ongoing investment in investment in public infrastructure facilities and commercial facilities
ED&C Components 	Japan		Poor first-half performance for products for machine tool manufacturers due to sluggish capital investment resulted from interest rake hikes in Europe and United States, but recovery in second half of fiscal year as a result of robust EV investment and 5G-related demand; consistently high inquiries regarding internet data center projects from power distribution board manufacturers	
	Overseas		Sluggish performance in China in first half of fiscal year due to market slowdown, but recovery in second half; second-half recovery in Singapore, South Korea, and United States, areas heavily impacted by semiconductor market slowdown	

Domestic

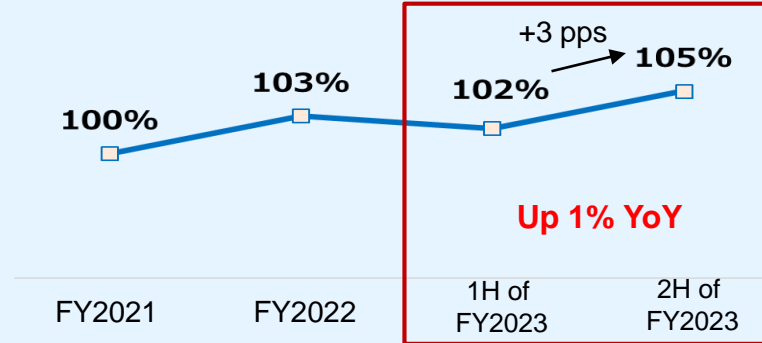
Machine Tool Market

Market size up 3% year on year, despite rebound from upfront arrangements felt in first half of fiscal year, due to support from EV and semiconductor investments



Power Distribution Market

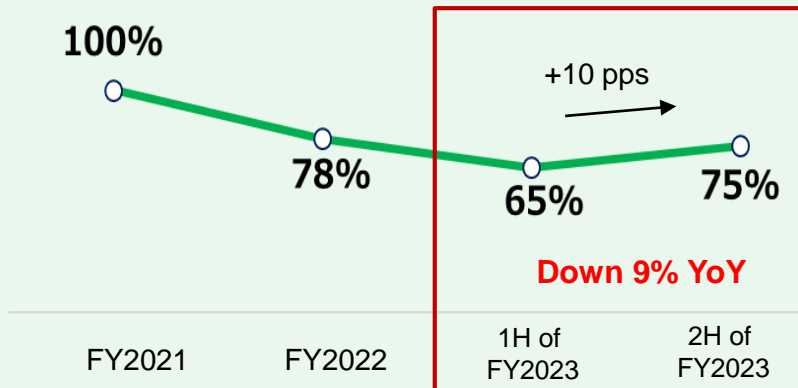
Year-on-year market growth of only 1%, despite strong internet data center demand, as a result of ongoing bearish trends redevelopment projects



Overseas

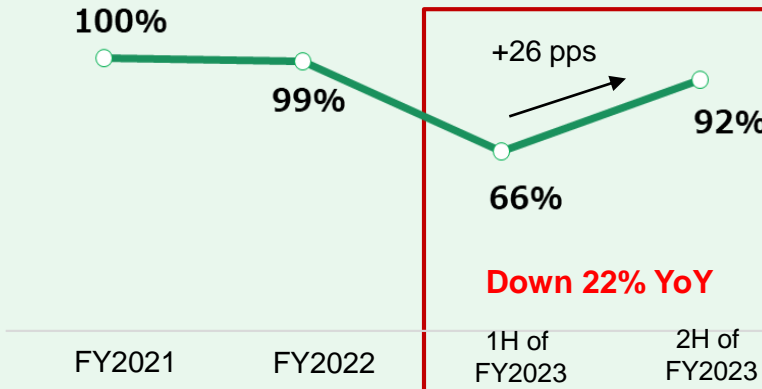
China

Stagnancy in first half of fiscal year due to inventory adjustments by sales agents
Reduction of 9% in market size, despite projected second-half recovery



Other Overseas Markets

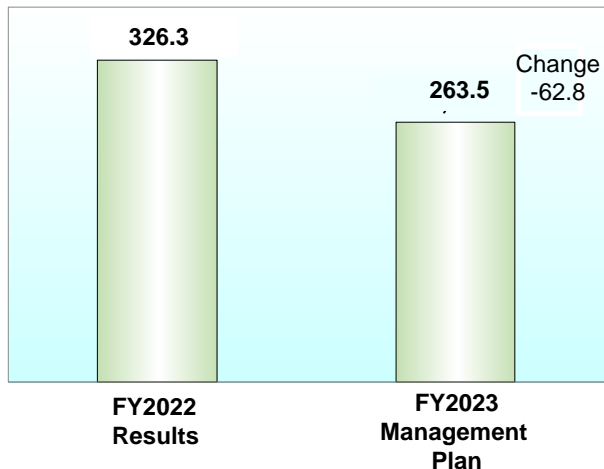
Recovery in second half of fiscal year, despite heavy impact of semiconductor market slowdown in first half



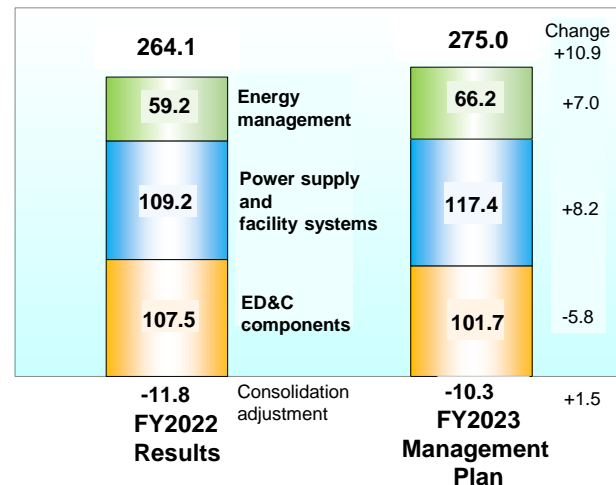
Note: Outlook is by formulated Fuji Electric FA Components & Systems based on meetings with major customers.

Deployment of sales promotion measures and reinforcement of management constitution

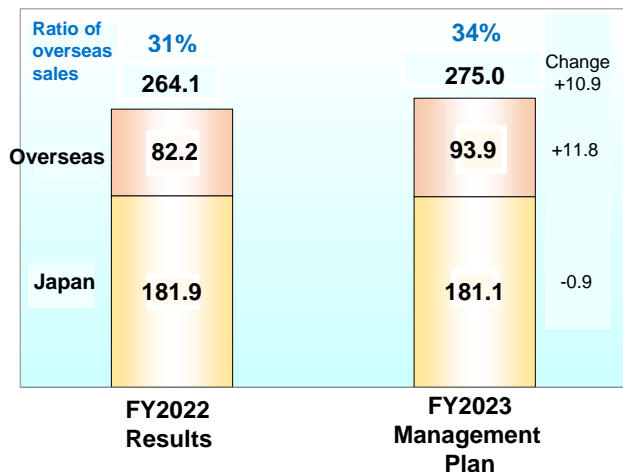
Amount of Orders Received (Billions of yen)



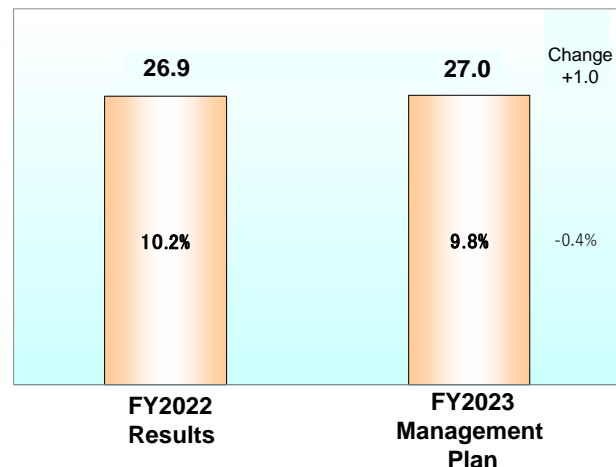
Net Sales by Subsegment (Billions of yen)



Net Sales in Japan / Overseas (Billions of yen)



Operating Income / Operating Margin (Billions of yen)



Business Policies

- Ongoing reinforcement of constitution to maximize income
- Expansion of businesses by increasing ability to accommodate carbon neutrality-related needs
- Continuous development of competitive products and business expansion through augmentation of engineering capabilities

Priority Measures

- Accomplishment of sales targets by launching and promoting new products (ED&C components)
- Enhancement of engineering and service systems (domestic and overseas)
- Development and launch of global products (Gas-Insulated Switchgears(GIS), transformers, large-capacity UPSs, etc.)

- Development of core models and launch of new products matched to market needs
- Expansion of orders through approach focused on encouraging use of specifications by customers in growth industries
 - Semiconductor production equipment
 - Machine tools
 - Internet data centers

Transition in New Core Models

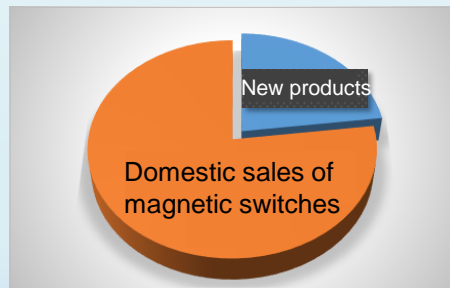
Launch of new models for magnetic switches (core ED&C components)

Launch scheduled for second half of FY2023

- ✓ **Characteristics matched to market needs**
Compact size, high reliability, increased ease of wiring, etc.
- ✓ **Contributions to carbon neutrality**
Energy conservation, renewable material use, etc.



Magnetic switches



Share of sales (after 100% transition)

Note: Distribution of sales is based on estimates by Fuji Electric FA Components & Systems.

Encouragement of Use of Specifications by Customers in Growth Industries

Ongoing approach toward customers in industries expected to see medium- to long-term growth

- ✓ **Engagement in negotiations** regarding collaborative projects and mutual use of sales channels
- ✓ **Expansion of proposals to customers** using bolstered lineup of product offerings



Plug-in breakers

- Semiconductor production equipment
- Internet data centers



Series spring terminals

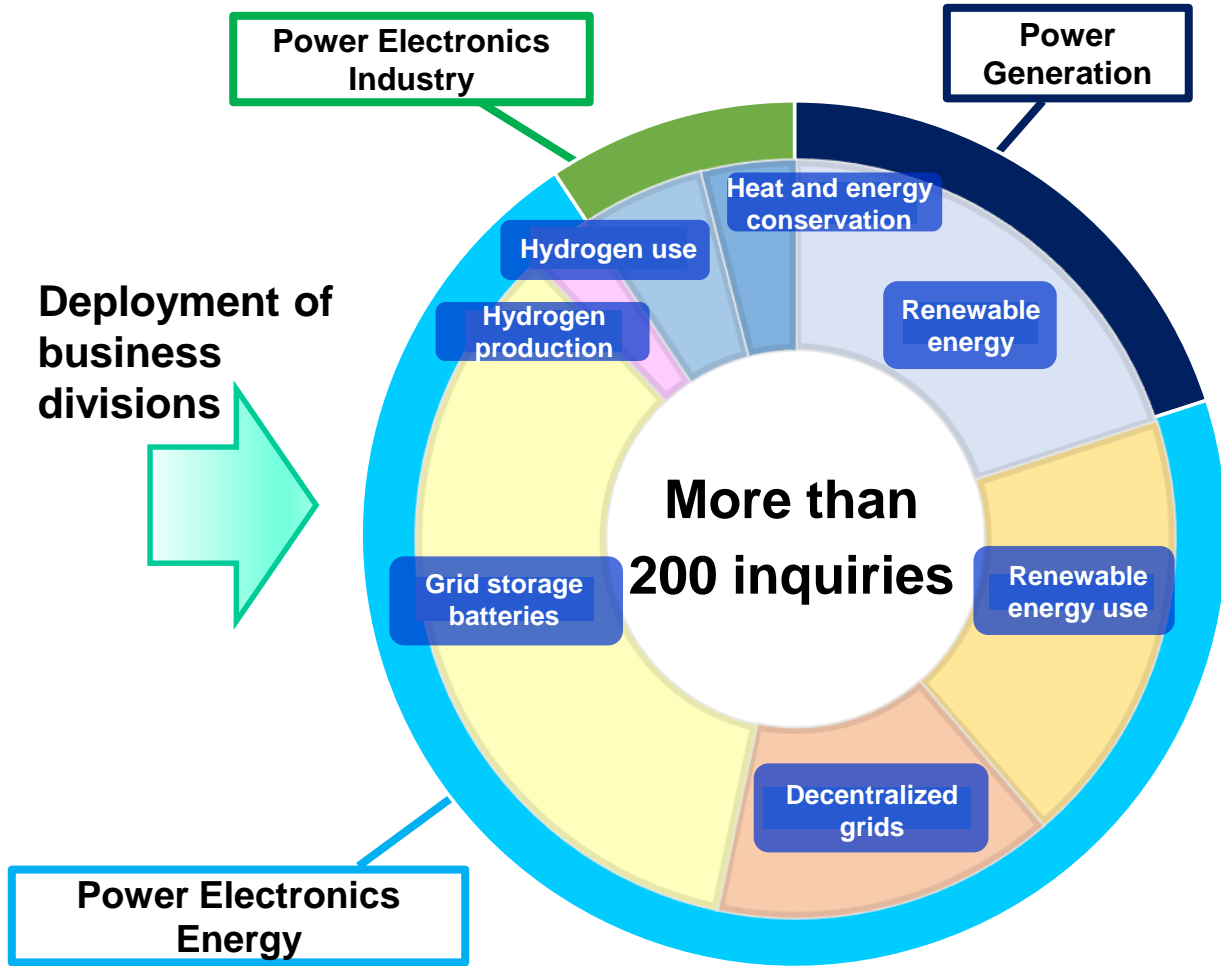
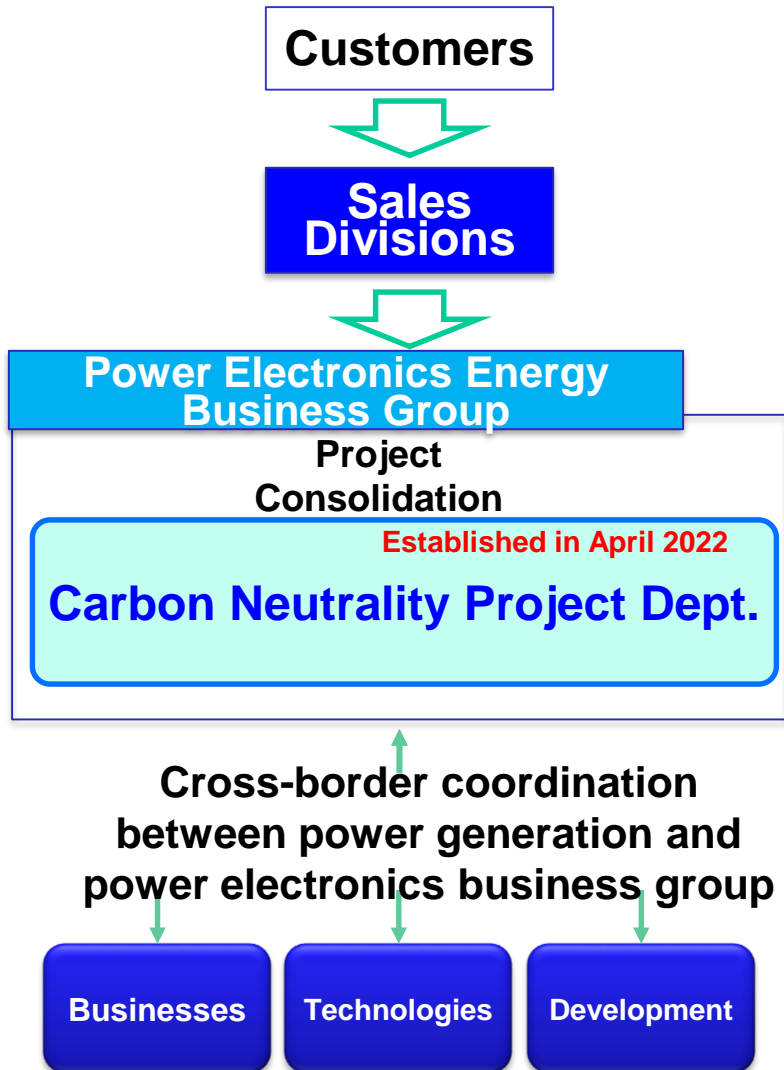
- Semiconductor production equipment
- Machine tools



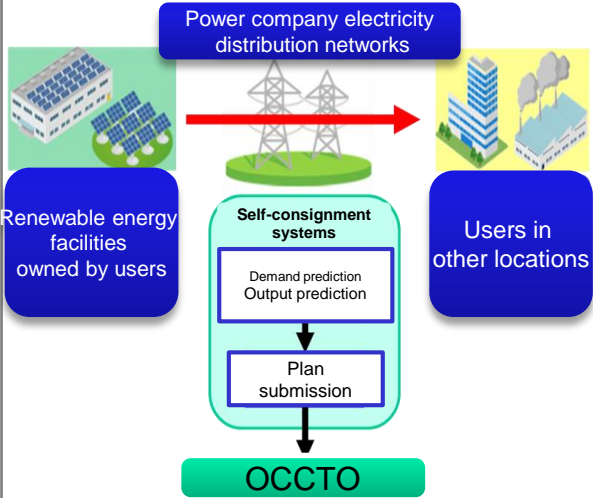
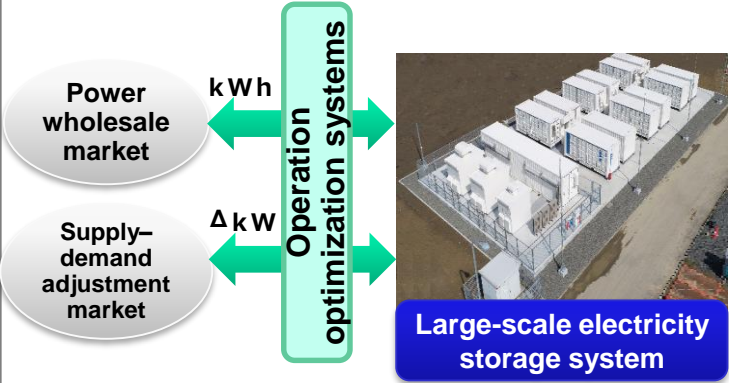
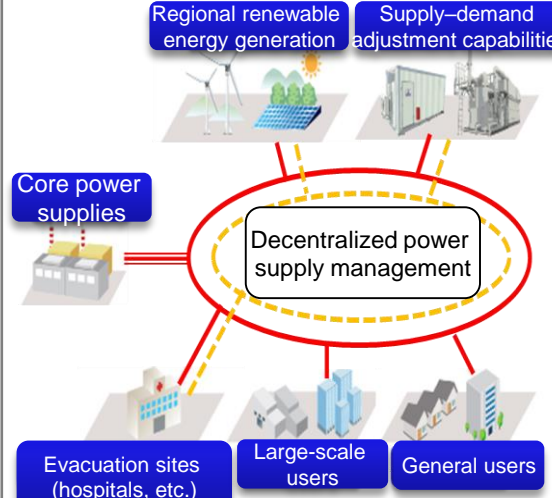
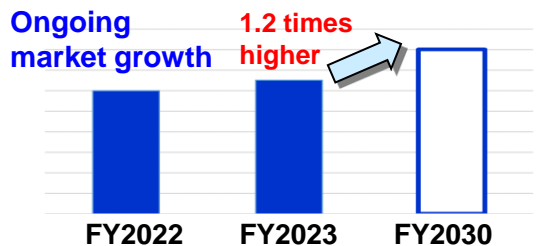
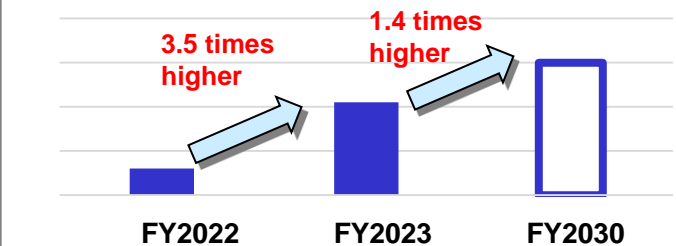
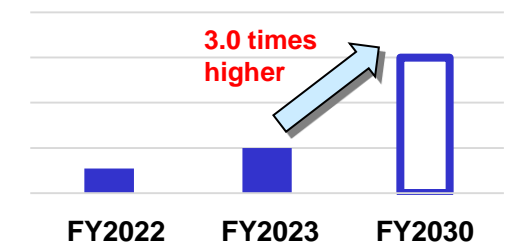
Thin command switches

- Machine tools

■ Increases in inquiries related to grid storage batteries, decentralized grids, and renewable energy use



Proposals to and acquisition of orders from business operators pursuing carbon neutrality

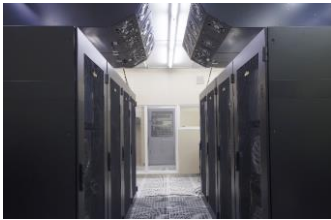
Field	Renewable energy use	Grid storage batteries	Decentralized grids
Overview	 <p>Power company electricity distribution networks</p> <p>Renewable energy facilities owned by users</p> <p>Users in other locations</p> <p>Self-consignment systems Demand prediction Output prediction Plan submission</p> <p>OCCTO</p>	 <p>Power wholesale market</p> <p>Supply-demand adjustment market</p> <p>Operation optimization systems</p> <p>kWh</p> <p>ΔkW</p> <p>Large-scale electricity storage system</p>	 <p>Regional renewable energy generation</p> <p>Supply-demand adjustment capabilities</p> <p>Core power supplies</p> <p>Decentralized power supply management</p> <p>Evacuation sites (hospitals, etc.)</p> <p>Large-scale users</p> <p>General users</p>
Conditions	<p>Rising adoption of self-use solar power systems by users with aim of achieving carbon neutrality</p>	<p>Widespread introduction of renewable energy generation systems driving introduction of grid storage batteries for maintaining supply-demand balance</p> <p>Rapid growth stimulated by subsidy programs</p>	<p>Increasing interest in regional microgrids for achieving self-sufficiency with regard to renewable energy and for implementing continuity measures</p> <p>Growth anticipated going forward</p>
Market outlook*	 <p>Ongoing market growth</p> <p>1.2 times higher</p> <p>FY2022 FY2023 FY2030</p>	 <p>3.5 times higher</p> <p>1.4 times higher</p> <p>FY2022 FY2023 FY2030</p>	 <p>3.0 times higher</p> <p>FY2022 FY2023 FY2030</p>

* Market outlook is based on Fuji Electric's projects.

■ Pursuit of business growth by proposing bundles packaging renewable energy systems, grid storage batteries, and energy management systems as comprehensive electric equipment orders

Major Customers

Data centers



Semiconductor factories



Reliable energy supply

Renewable energy adoption, energy saving

Comprehensive proposals encompassing engineering, installation, and maintenance services



Substation equipment



In-house power generation equipment



Transformers



Monitoring systems



UPSs



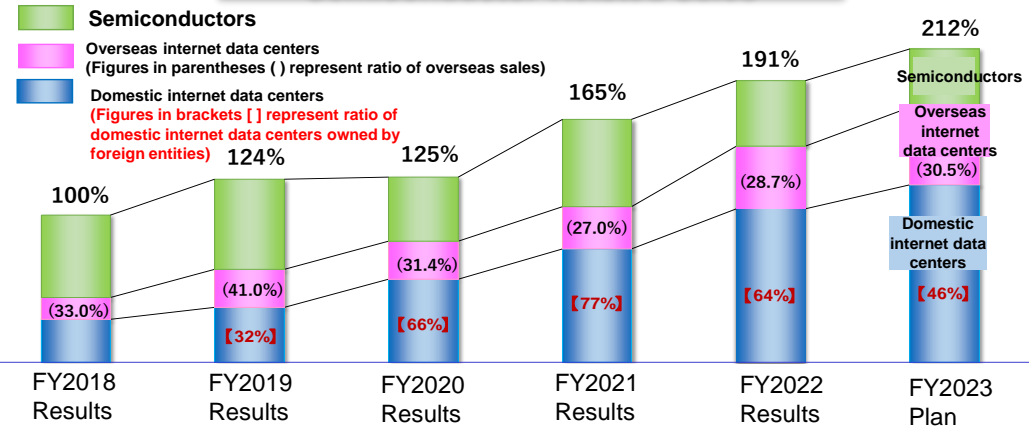
GISs



Equipment construction and services



Internet Data Center- and Semiconductor-Related Sales



Fuji Electric's shares of UPSs for data centers

(26%) (34%) (33%) (33%) (40%)

Source: <Share from 2018 to 2022> of Data Center Business Market Survey (2019 to 2023), Fuji Chimera Research Institute

Renewable energy, energy storage, and energy management systems

Renewable energy systems (solar, wind, etc.)



Energy storage systems



Energy management systems



■ Enhancement of service offerings and systems for accommodating rising deliveries of products for internet data centers and semiconductor manufacturers

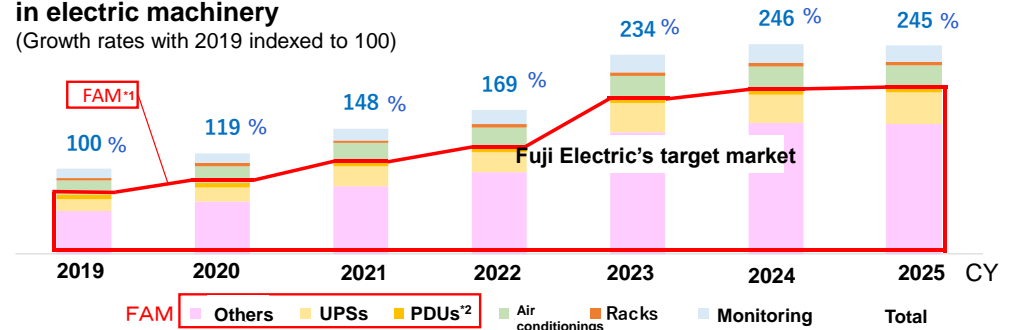
Measures

- ✓ **Development of one-stop consultation venues**
- ✓ **Transition from one-time service contracts to annual maintenance contracts**
- ✓ **Localization of overseas services**
 - Allocation of training equipment and maintenance parts
 - Training of local testers
- ✓ **Incorporation of upgrade demand pertaining to previously delivered products**
 - Proposal of systems that can accommodate upgrade demand (upgrade periods of approx. 15 years)

■ Internet Data Center-Related Capital Investment—Brisk capital investment in Japan expected to continue to FY2025

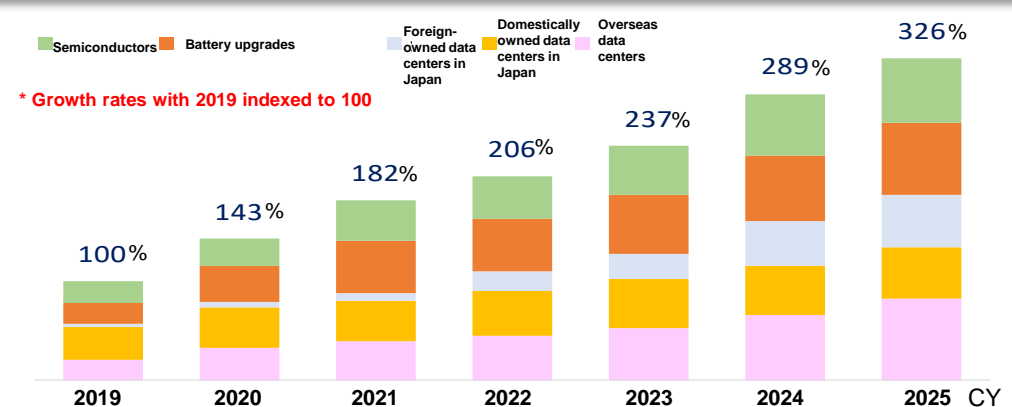
Breakdown of domestic capital investment in electric machinery

(Growth rates with 2019 indexed to 100)



Source: Market from 2019 to 2024: *Data Center Business Market Survey (2021, 2022)*, Fuji Chimera Research Institute
Note: Target market for 2025 is based on Fuji Electric's projections.

■ Internet Data Center and Semiconductor Maintenance Service Sales Projects








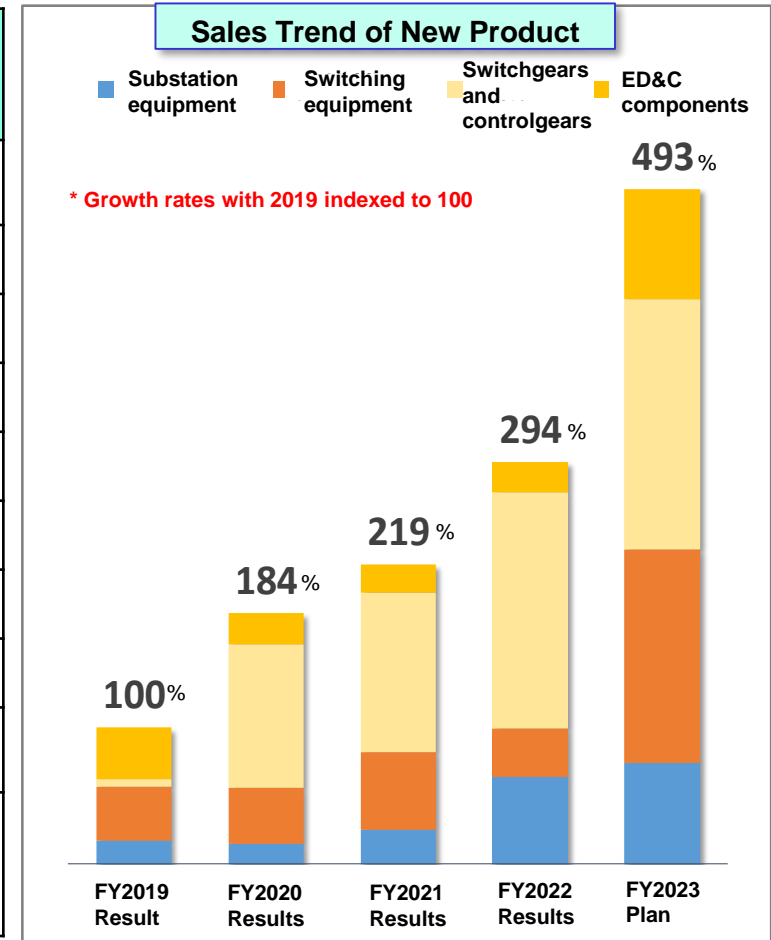
*1 Fuji Available Market

*2 Power distribution units

Priority Measures <Shared>

- Launch and promotion of new products
- Development and market deployment of new products (promotion of new product launches)

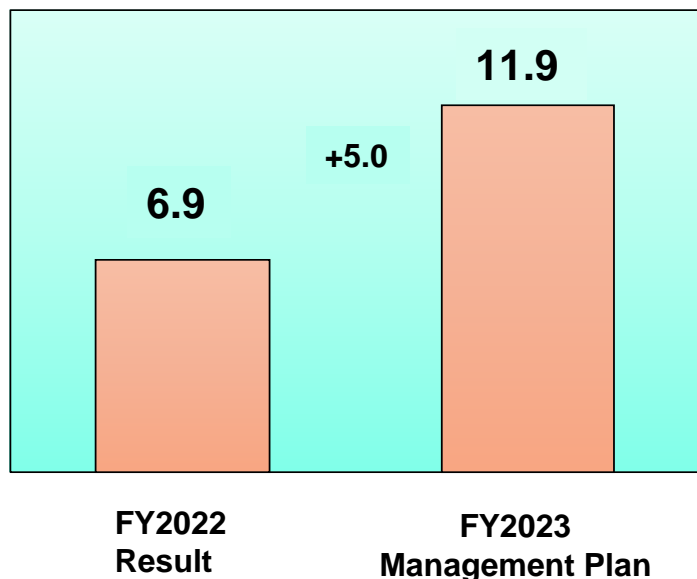
Models	Specifications	FY2022	FY2023		FY2024	
			1H	2H		
Magnetic switches 	11 A–18 A 2.2 kW–3.7 kW	Development		Scheduled launch		
Global substation equipment	Transformers 	FR3 oil*1	Launch			
		230 kV	Development		Scheduled launch	
	Gas-insulated switchgears 	115 kV	Short-circuit resilience testing			Scheduled launch
		245 kV	Development			Scheduled launch
		168 kV	Form testing			Scheduled launch
	C-GISs*2 	123 kV	Refinement and testing	Verification		Scheduled launch
		72/84 kV	Development			Scheduled launch
Medium and large-capacity UPSs	2400 kVA	Development	Launch			
Electricity storage PCSs (Power conditioning system) 	1500 V compatible BCP compatible	Development			Scheduled launch	
		Development			Scheduled launch	



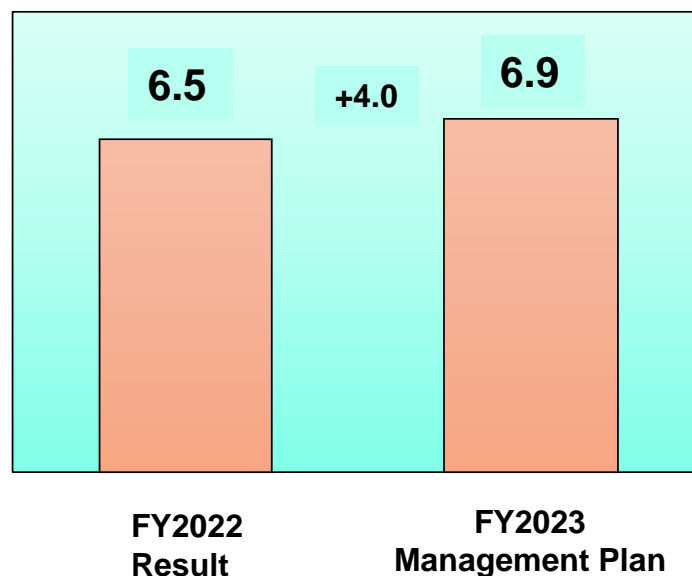
*1 Natural ester dielectric fluid derived from 100% renewable plant matter

*2 Cubicle-type gas-insulated switchgears

Capital Investment (Billions of yen)



Research and Development (Billions of yen)



- ◆ Energy Management
 - Introduction of development and testing apparatuses
- ◆ ED&C Components
 - Installation of production equipment for new ED&C component products

- ◆ Energy Management
 - Global products (transformers, molded-case transformers, GISs, switchgears and control gears)
 - Carbon neutrality and eco-friendly products (electricity storage systems, energy management systems)
- ◆ Power Supply and Facility Systems
 - Expansion of large-capacity UPS series

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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