

# Power Electronics Energy Business Strategies

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**Masashi Kawano**

Managing Executive Officer

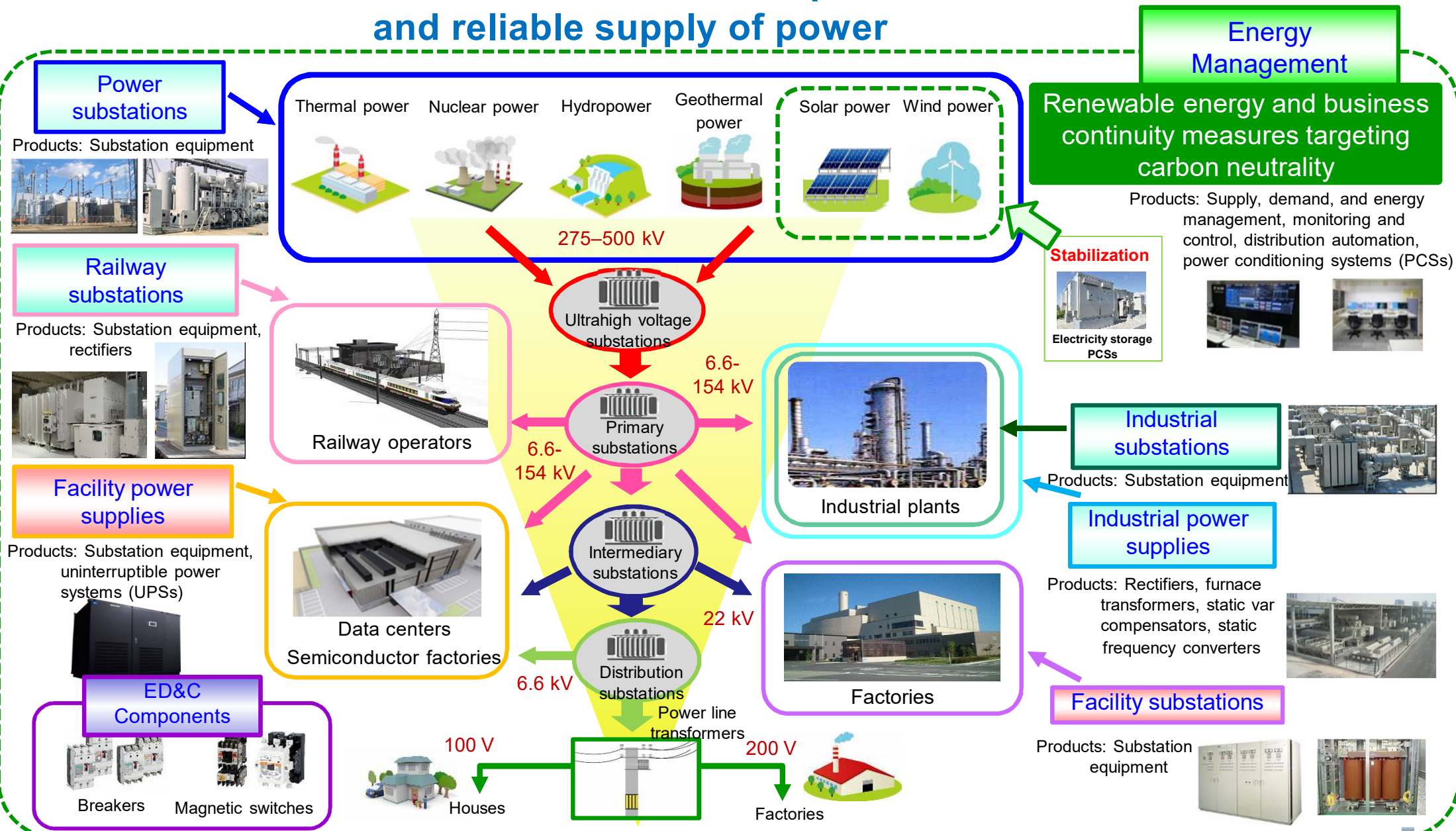
Corporate General Manager

Power Electronics Energy Business Group

Fuji Electric Co., Ltd.

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

## Contributions to stabilization, optimization, and reliable supply of power



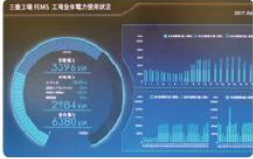
**FY2021 Net sales**  
231.0 billion yen

**Energy Management**  
  
25% of total net sales


**Power Supply and Facility Systems**  
  
35% of Total net sales

**ED&C Components**  
  
40% of Total net sales


## Contributions to stabilization, optimization, and reliable supply of power




**Energy management systems**




**\*power conditioning systems (PCSs)**



**Large-capacity transformers**



**Substation equipment**



**Large-capacity rectifiers**

**No. 1 global market share\***

**Leading domestic share**



**Uninterruptible power systems (UPSs)**



**Switchgears and control gears**

**No. 1 domestic share\***



**Magnetic switches**

**No. 2 domestic share\***



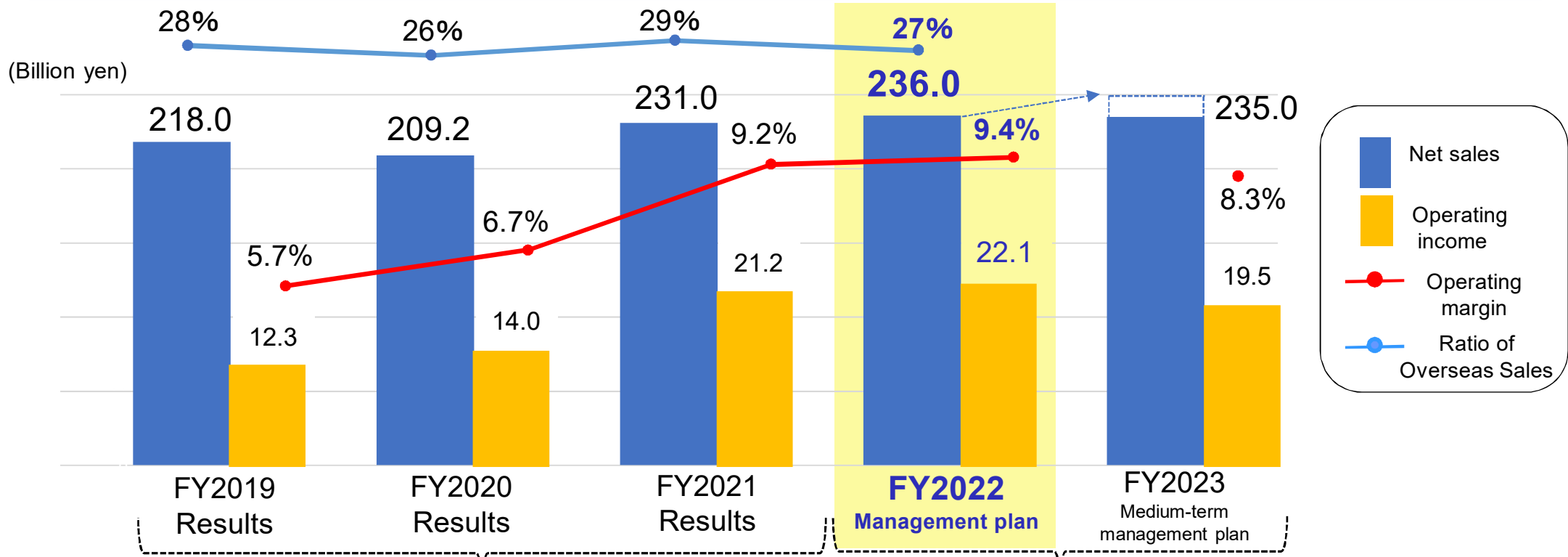
**Molded-case circuit breakers**

- Major Customers Industries**
- Energy Management**
- Electricity
  - Power generation companies
  - New power, public utilities
  - Steel, nonferrous metals, oil, chemicals
  - Railways
- Power Supply and Facility Systems**
- Data centers
  - Semiconductors
  - General industry
  - Financial institutions
  - Hospitals
- ED&C Components**
- Machinery manufacturing
  - Switchboard manufacturing

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

FY2023 net sales target to be accomplished a year ahead of schedule in FY2022



## FY2019–2021 (Three-Year) Results
















- Ongoing orders from foreign internet data center operators and semiconductor companies
- Development and launch of 7500WX large-capacity UPS
- Completion of development of transform using FR3 natural ester fluid
- Enhancement of manufacturing (standardization, in-house production, production rationalization)

## Challenges

- Expansion of overseas businesses
- Response to delays in launches of new products for overseas markets

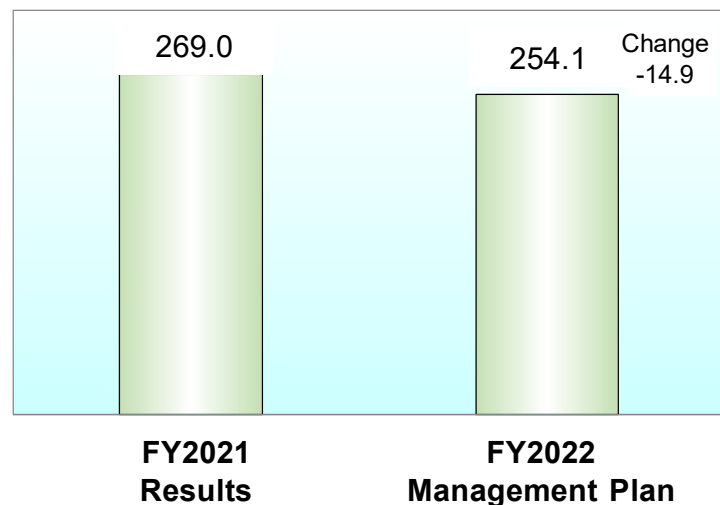
Note: Figures for FY2021 performance reflect the business reorganization undertaken in the FY2022.



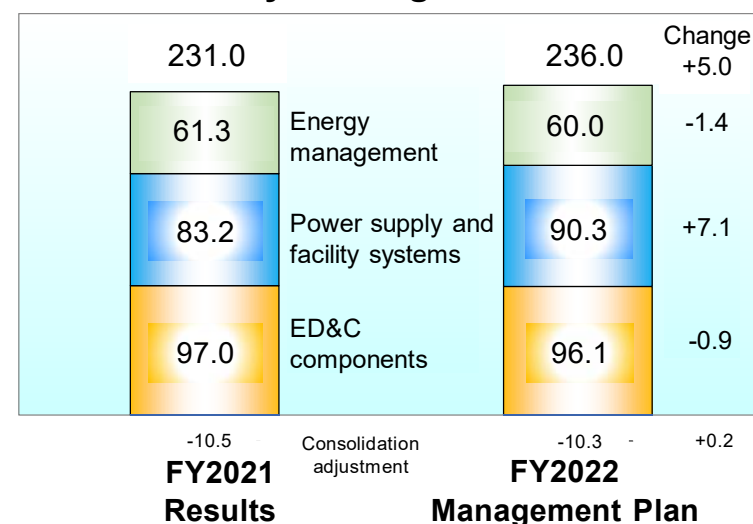
	Field	Japan / Overseas	YoY Change	Market Outlook (FY2022)
<b>Energy Management</b> 	Power	Japan		Consistent capital investment related to aging substation facilities and to next-generation energy and renewable energy for achieving carbon neutrality, despite ongoing investment curtailment among electricity companies
		Overseas		Curtailment of substation investment and stagnant economic conditions among COVID-19 pandemic in Asia Acceleration of renewable energy introduction and other environmental measures in response to tightening of environment regulations and government policies
	Industrial	Japan		Recovery in performance and <b>anticipations for capital investment targeting carbon neutrality</b>
		Overseas		Capital investment stimulated by YoY GDP growth in Southeast Asia countries anticipated
	Railway	Japan		Halts, albeit inconsistent, to performance downturns among railway operators, which have continued amid COVID-19 pandemic Gradual recovery in capital investment anticipated in FY2022 for purposes of ensuring safe and reliable transportation
		Overseas		Progress in railway construction plans centered on Asian emerging countries, but delays due to COVID-19 pandemic Gradual resumption expected in FY2022
<b>Power Supply and Facility Systems</b> 	Power supplies	Japan		<b>Ongoing construction investment by foreign internet data center operators and favorable investment by domestic internet data center operators</b> Recovery in small to medium-sized projects in Japan anticipated following conclusion of COVID-19 pandemic
		Overseas		Internet data center demand construction plans broadening out of Singapore and into surrounding countries in Southeast Asia Ongoing investment supported by growing semiconductor demand
	Facility electrical equipment	Japan		Ongoing investment in machine tool and semiconductor fields
		Overseas		Ongoing investment in public infrastructure facilities, commercial facilities, and semiconductor field
<b>ED&amp;C Components</b> 	Japan		<b>Strong performance in products for equipment manufacturers stimulated by EV investment and higher 5G demand</b> <b>Consistently high inquiries regarding internet data center projects from power distribution board manufacturers</b>	
	Overseas		Sluggish growth in Chinese market interrupting growth trend seen in FY2021 Need to monitor COVID-19 pandemic trends when making economic decisions Gradual recovery in Southeast Asian market anticipated following relaxation of activity restrictions	

## Deployment of sales promotion measures and reinforcement of management constitution to accomplish medium-term management plan

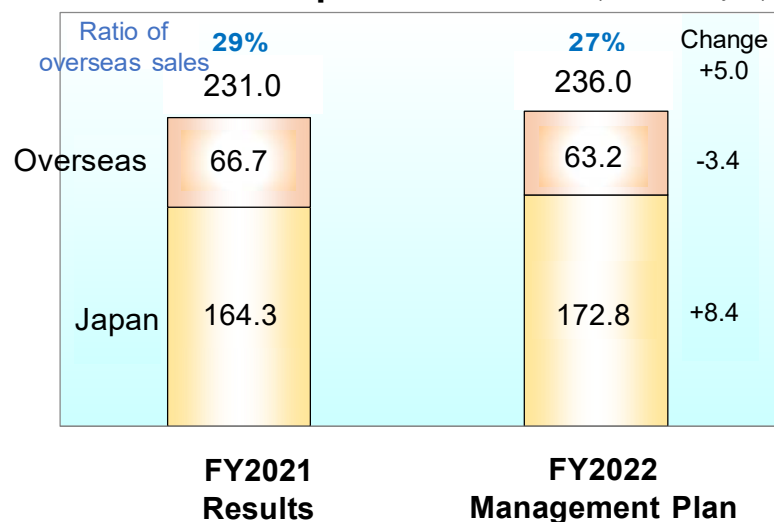
**Amount of Orders Received** (Billion yen)



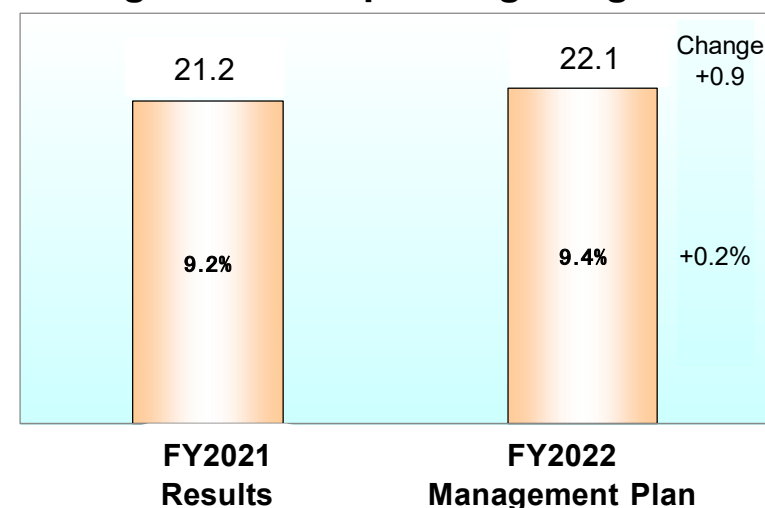
**Net Sales by Subsegment** (Billion yen)



**Net Sales in Japan / Overseas** (Billions of yen)



**Operating Income / Operating Margin** (Billions of yen)



## ◆ Energy Management

- Exploration of carbon neutrality market
- Growth of sales volumes by expanding baseload sales volume and approaching new customers
- Expansion of operations in Southeast Asia through introduction of global products and enhancement of engineering capabilities

## ◆ Power Supply and Facility Systems

- Ongoing acquisition of large-scale internet data center and semiconductor project orders
- Expansion of overseas sales centered on Southeast Asia

## ◆ ED&C Components


- Ongoing reinforcement of constitution (accelerated approach toward new customers and development of core models)



- Provision of comprehensive solutions for supporting introduction and procurement of renewable energy
- Supply of expertise gained through Fuji Electric's carbon neutrality initiatives to customers
- Development of models for addressing carbon neutrality requirements (renewable energy, new fuel, energy saving, electricity regulations, CO2 recovery)

## Fuji Electric's Carbon Neutrality Initiatives

**Environmental Vision 2050**

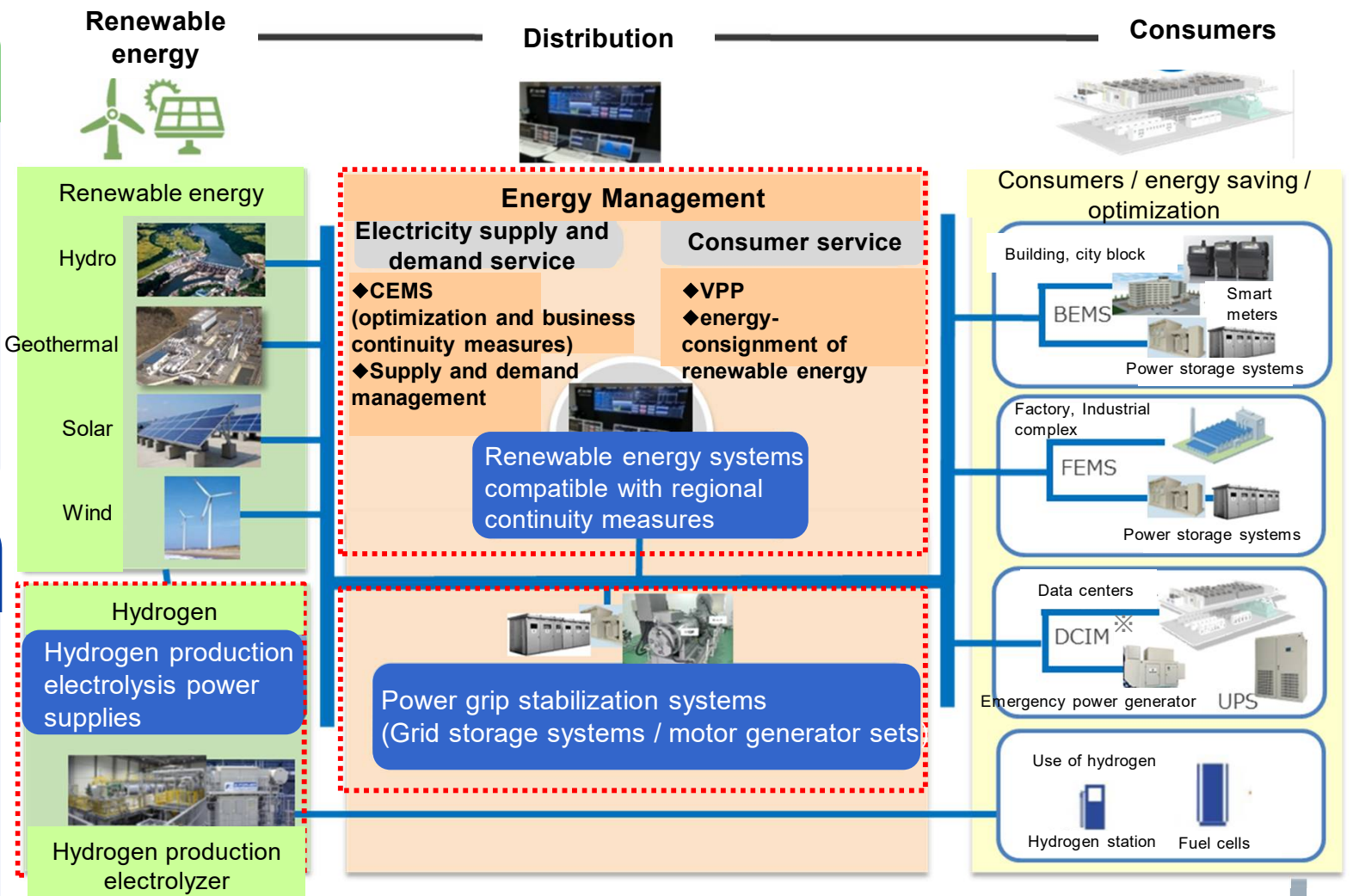


**Overview of Fuji Electric's Initiatives**

- **Dedicated renewable energy generators**
- **Procurement of renewable energy through additive approach (use at Fuji Electric factories)**
- Purchase of renewable energy, etc.

## Renewable Energy Distribution Business

- Power grip stabilization systems
  - Grid storage battery systems
  - Stabilization motor generators (motor generator sets)
- Renewable energy systems compatible with regional continuity measures
- Hydrogen production electrolysis power supplies



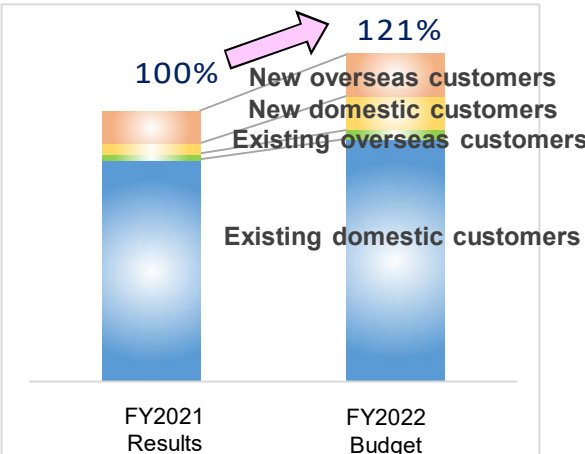
\* DCIM: Data center infrastructure management

# <Energy Management> Growth of Substation Orders

- **Japan:** Expansion of plant operations (growth fueled by comprehensive capabilities), development of comprehensive electrical equipment operations
- **Overseas:** Incorporation of orders from target customers through enhancement of engineering capabilities (acquisition of loyal customers)
- **General:** Development of competitive components (transformers, circuit breakers, switchgears and controlgears (IEC boards))

Classification		Industry	Major measures	FY2022 Order Targets (YoY Growth)
J a p a n	Existing customers	Steel, chemicals, heavy machinery, oil	<ul style="list-style-type: none"> <li>• Technical support for customers built on existing facility insight</li> <li>• Incorporation of PCB-embedded transformer upgrade orders</li> <li>• Expansion of distribution board business</li> </ul>	<b>+19%</b>
	New customers	Ferrous and nonferrous metals	<ul style="list-style-type: none"> <li>• Development of channels with new customers</li> <li>• Strategic expansion of replacements (upgrades) of rival offerings</li> </ul>	
		Chemical, etc.	<ul style="list-style-type: none"> <li>• <b>Promotion of Fuji Electric's specifications through coordination with general contractors</b></li> <li>• <b>Timely technical coordination and swift development of projects</b></li> </ul>	
O v e r s e a s	Existing customers	Direct trading	<ul style="list-style-type: none"> <li>• Steady replacement (upgrades) of rival offerings</li> <li>• Enhancement and rekindling of relationships with customers through engineers stationed on-site</li> </ul>	<b>+33%</b>
	New customers	Sales companies	<ul style="list-style-type: none"> <li>• <b>Coordination with FMT's engineering center to approach companies in Thailand</b></li> <li>• Expansion of orders from Japanese companies through coordination with domestic sales divisions</li> </ul>	
Development		<ul style="list-style-type: none"> <li>• Development of differentiated products Transformers (using FR3 oil), circuit breakers (with lower SF6 emissions), switchgears and controlgears (IEC compliant)</li> <li>• Development of competitive components and expansion of series through platform development</li> </ul>		

## Order Target 21% YoY increase



Transformers



Gas-insulated switchgears



Molded-case transformers



Switchgears and controlgears (IEC compliant)

- Participation in new business negotiations through proposals of new models to increasingly large-capacity internet data centers
- Reduction of peripheral, construction, and other system costs
- Contributions to reduction of CO<sub>2</sub> emissions through extensive cuts to wiring

Characteristics of 7500WX UPS



1. Industry-leading installation space conservation
2. Industry-leading electricity conversion efficiency
3. Compatibility with global-standard power supply specifications

### Large-Capacity UPS Development Plan

Model		Specifications	2020	2021	2022	2023
UPS	7500WX large-capacity UPS	1200 kVA	Development	Adoption		
		2400 kVA		Development	Adoption	

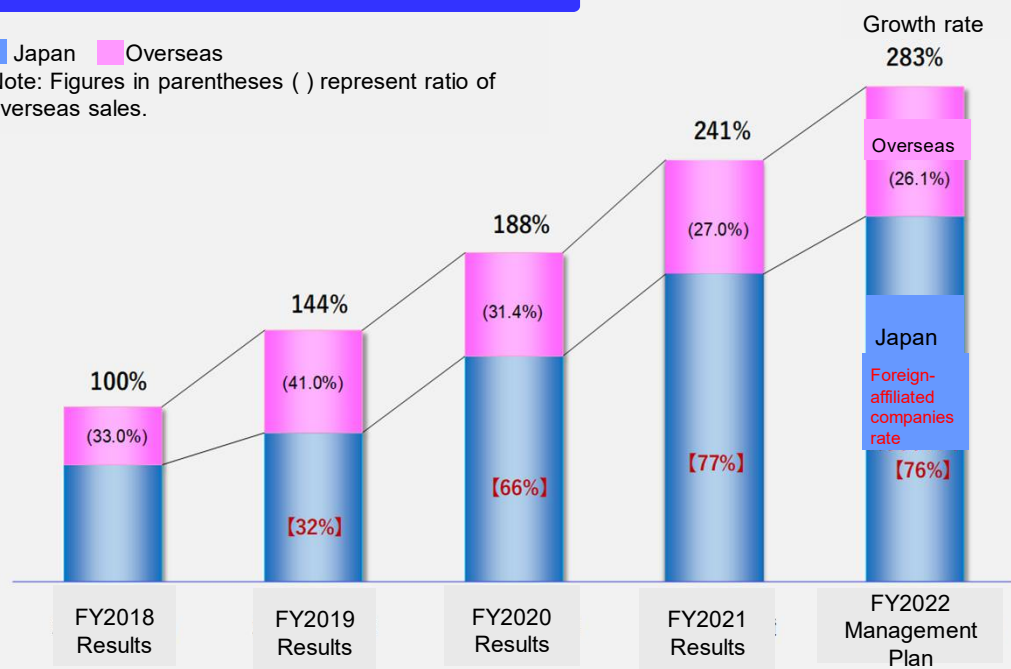
### 7500WX Orders

	Customer	UPS capacity	Units	Delivery	Order status	
1	Foreign business operator A	1200 kVA	32	November 2021–October 20220	Received	Foreign
2	Foreign business operator A	1200 kVA	4	July 2022	Received	
3	Foreign business operator A	1200 kVA	8	July 2022	Received	
~~~~~						
7	Domestic business operator D	1000 kVA	14	January 2024	Under negotiation	Domestic
8	Domestic business operator E	1200 kVA	6	October 2022	Under negotiation	
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12	Domestic business operator I	1800 kVA 750 kVA	6 3	July 2023	Under negotiation	

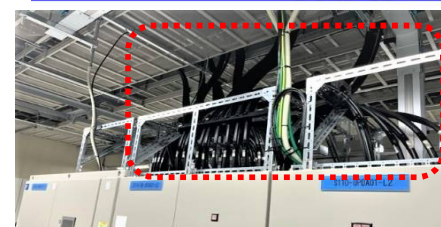
### Internet Data Center-Related Sales

Japan Overseas

Note: Figures in parentheses ( ) represent ratio of overseas sales.



### Reduction of CO<sub>2</sub> Emissions through Extensive Cuts to Wiring



Conventional system  
(Connection to board rows)

CO<sub>2</sub> emissions reductions



New system  
(Connection within boards)

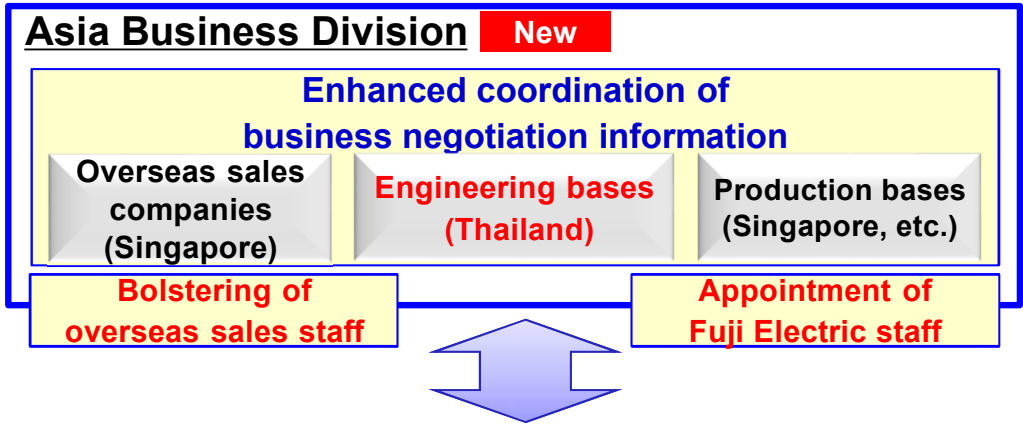
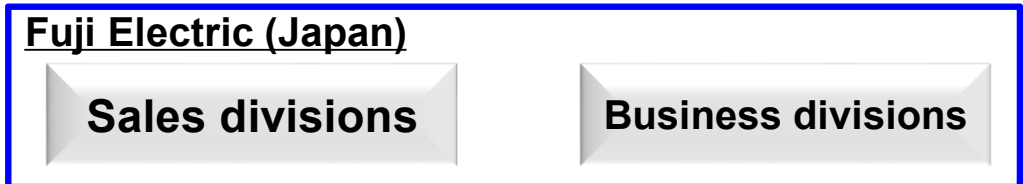
Systems	Target	Bus duct / cable usage amount	CO <sub>2</sub> emissions per 1 MVA
Conventional	2 sets of 500 kVA 8 units	47 t	25.4 t-CO <sub>2</sub> /MVA
New	4 sets of 1,200 kVA 2 units	14 t	5.7 t-CO <sub>2</sub> /MVA

↓ 70%



- Reinforcement of sales promotion systems targeting internet data center and semiconductor companies in Singapore and other parts of Southeast Asia
- Accelerated response to business negotiations through swift information collection by positioning staff in overseas production bases and sales companies

**Reinforcement of Sales Promotion Systems in Southeast Asia**



**Internet data center and semiconductor companies**

Overseas Production Companies  
FSMBE: Fuji SMBE Pte. Ltd.; FMTEC: Engineering center of Fuji Electric Manufacturing (Thailand) Co., Ltd.

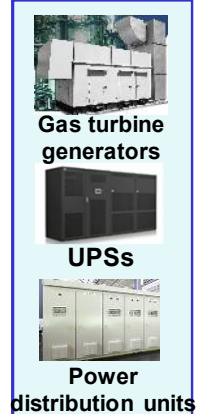
Overseas Sales Companies  
FAP: Fuji Electric Asia Pacific Pte. Ltd.; FET: Fuji Electric (Thailand) Co., Ltd.;

**Business Negotiation Initiatives**

Region	Products	Measures	Negotiation status
Singapore	Gas turbine generators	Application of Japanese track record	Order acquired by FAP (FY2020)
Thailand	Power distribution units (low-voltage distribution boards)	Promotion of FSMBE products	Letter of intent acquired by FSMBE (FY2020)
	Molded-case transformers	Promotion of FMT products	Letter of intent acquired by FET (FY2020)
Japan	Power distribution units (low-voltage distribution boards), etc.	Promotion of FSMBE products	Order acquired by Fuji Electric (FY2021)



Indonesia	Gas turbine generators	Application of Japanese track record	Bid submitted
	UPSs	Application of Japanese track record (large-capacity UPSs)	Bid submitted
Thailand	Power distribution units (low-voltage distribution boards), etc.	Promotion of FSMBE products	Repeat order received



## Full leveraging of benefits of constitution reinforcement measures advanced since FY2020 to maintain high profitability

### FY2022 Priority Measures

#### ■ Enhanced coordination with Fuji Electric component sales team for approaching new customers

- Integration of sales bases
- Deployment of joint measures (diversified projects)

#### ■ Acceleration of cost reductions and streamlining of fixed costs in response to high material prices

- Ratio of variable costs unchanged from previous fiscal year, despite high material prices, due to accelerated cost reductions and transference of costs to selling prices
- YoY reduction of 7 percentage points in ratio of fixed costs due to constitution reinforcement measures

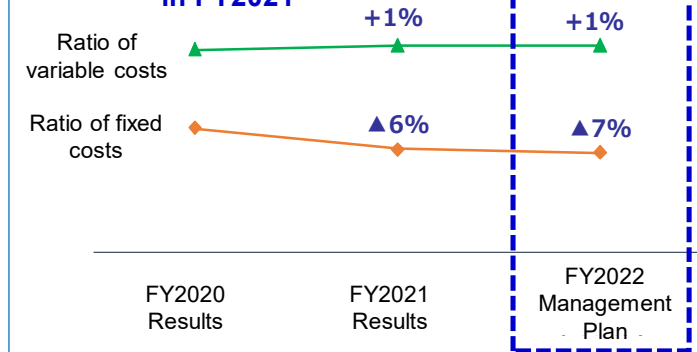
#### ■ Development of core models to bolster model competitiveness

- Ongoing concentration of investment in major models\*

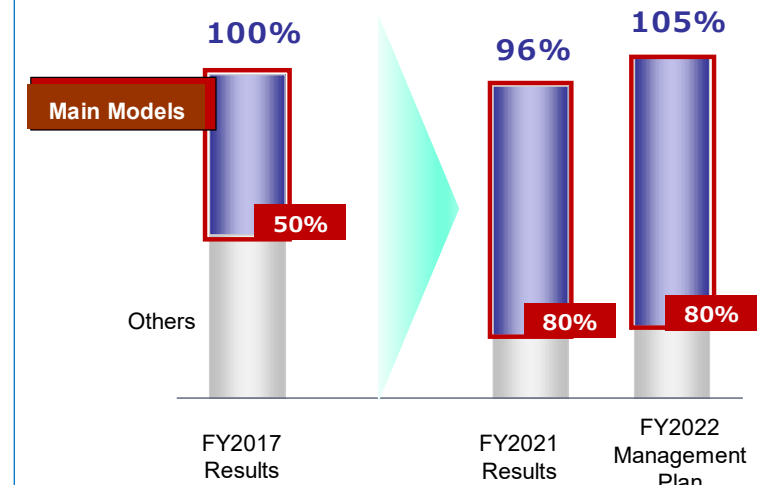
\* Major models: Switch controls, command switches, low-voltage power distribution, medium-voltage power distribution

### Cost Ratios

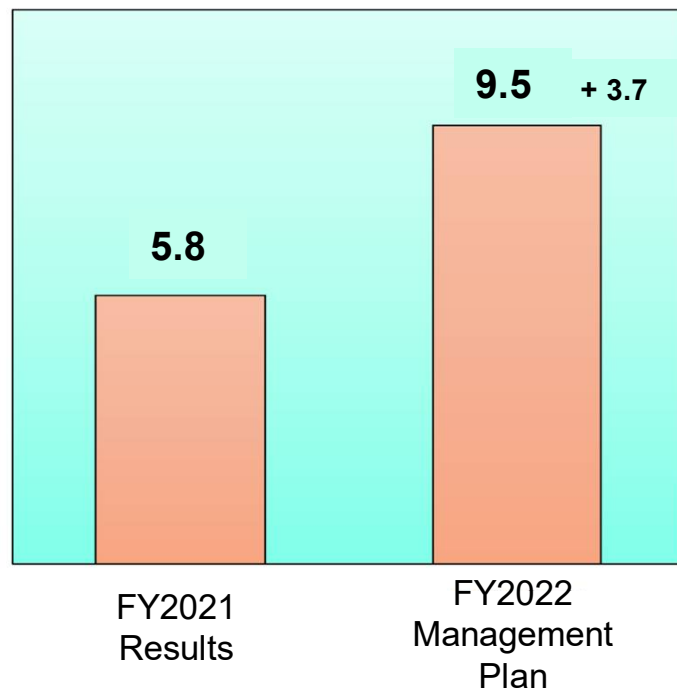
Record-high income achieved in FY2021



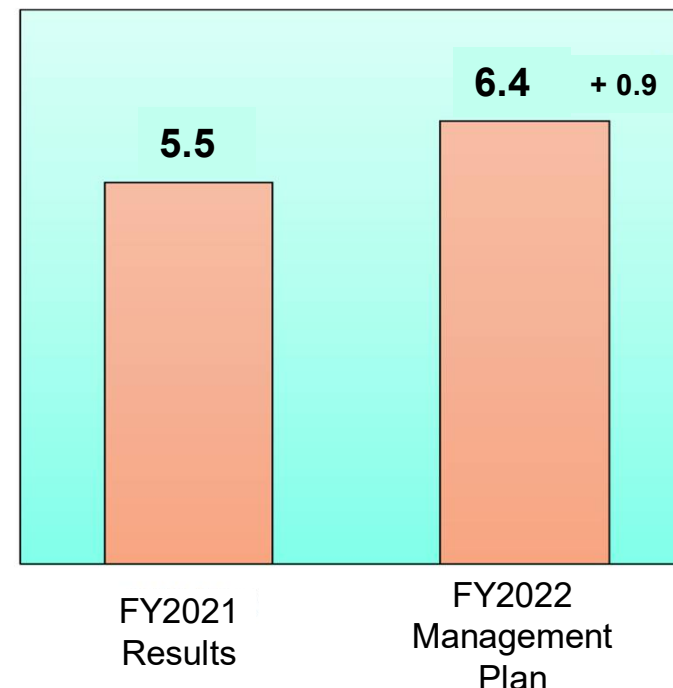
### Development Investments



## Capital Investment (Billion yen)



## Research and Development (Billion yen)



- ◆ Power Supply and Facility Systems
  - Factory rationalization, upgrades, and repairs
- ◆ ED&C components
  - Expansion of production capacity for ED&C component (magnetic switches)

- ◆ Transmission and distribution systems
  - Transformers, gas-insulated switchgears
- ◆ Power Supply and Facility Systems
  - Global products (Extra-large capacity UPSs)
- ◆ ED&C Components
  - Core products (switch control, low-voltage power distribution)



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