Fuji Electric
Innovating Energy Technology

Semiconductor Business Strategies

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Business Overview

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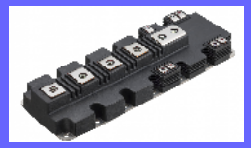
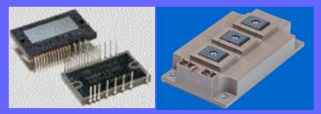
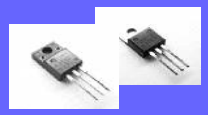
Reorganization of industrial, automotive, and information subsegments to form industrial and automotive subsegments in FY2022

Subsegments	Major Products	Applications, Customer Industries
Industrial 52% of total net sales	IGBT modules   Power supply ICs  MOSFETs 	Inverters, NC machine tools, elevators, etc. (factory automation, general industry) Solar/wind power PCSs* (new energy) Household air-conditioning, TVs, etc. (consumers, etc.)  Inverters  NC machine tools  PCSs  Household air-conditioning  Flat-screen TVs
Automotive 41% of total net sales	IGBT modules   Pressure sensors  Power ICs 	xEV motor control, engine control, transmission control, brake control, steering control, etc.  xEVs, gasoline vehicles
Information 7% of total net sales	Photoconductors  Aluminum substrates, glass substrates 	Copiers, printers HDDs

Reorganization into industrial

Withdrawal

Note: Percentages of total net sales represent FY2021 performance and are calculated before deduction and adjustment for inter-segment sales.

* PCS: Power conditioning systems

Progress Under Medium-Term Management Plan

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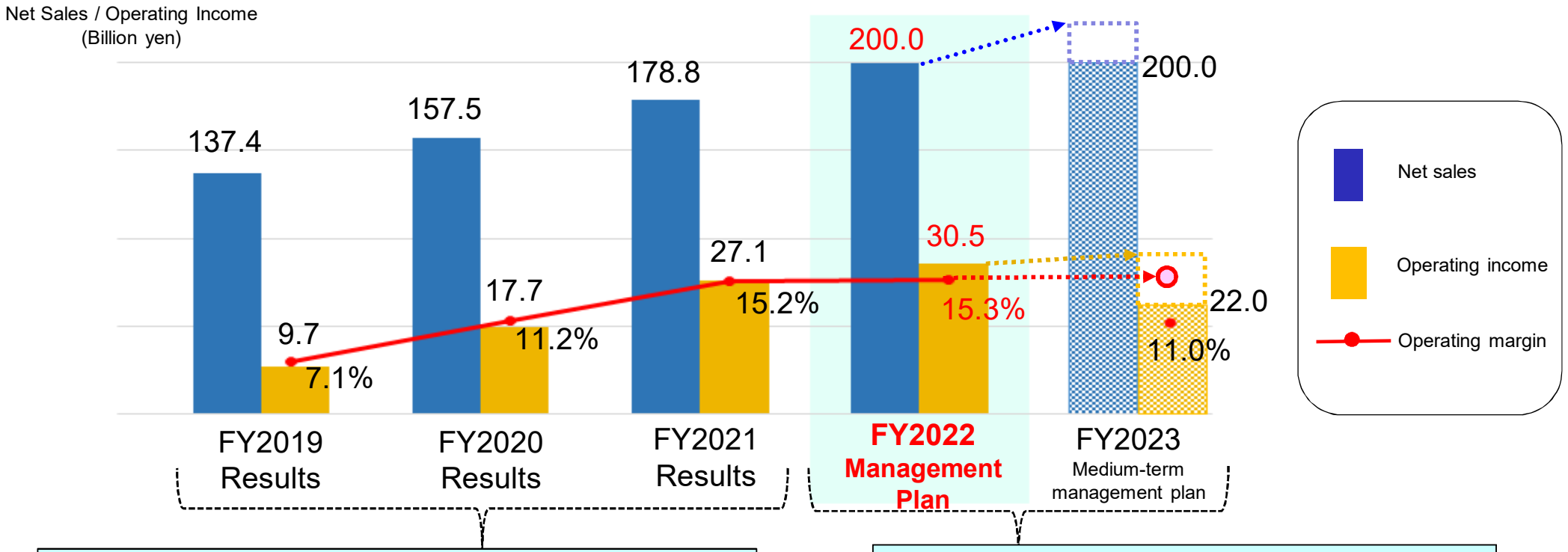
FY2023 targets of medium-term management plan to be accomplished one year in advance in FY2022



FY2019–2021 (Three-Year) Results

- **14.1% average annual growth in net sales, operating margin surpassing medium-term management plan**
- **Increase in ratio of sales from automotive subsegment (FY2018: 28% → FY2021: 44%)**
- **Increase in ratio of sales accounted for by 7th-generation IGBTs (FY2018: 7% → FY2021: 27%)**
- **Augmentation of 8-inch wafer production capacity (March 31, 2022: Triple level from March 31, 2019)**

Challenges

- **Further expansion of sales in growing automotive semiconductor market**
- **Augmentation of 8-inch Si device production capacity and preparation for emergence of SiC device market**

Market Outlook

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Industrial: Continuously favorable demand trends

Automotive: Growth of more than 40% in xEV market and flat growth in gasoline vehicle market

		Market Outlook (FY2022)	
		YoY Change	Details
Industrial	Factory automation	→	Continuation of favorable trends in 5G- and semiconductor production equipment-related markets
	Renewable energy	→	Accelerated global decarbonation movement driving shift from fossil fuels to renewable energy
	Consumers, etc.	→	Growth in demand for eco-friendly air-conditioners and home appliances, but dissipation of demand related to people staying at home
Automotive	xEVs	↗	Ongoing trend toward xEVs
	Gasoline vehicles	→	Flat growth

Note: Factory automation comprises inverters, servo, and machine tools etc. ; Renewal energy comprises wind power and solar power generation-related products; consumer, etc. comprises products such as household air-conditioners and TVs; and xEVs refers to full hybrid vehicles and electric vehicles (EVs).

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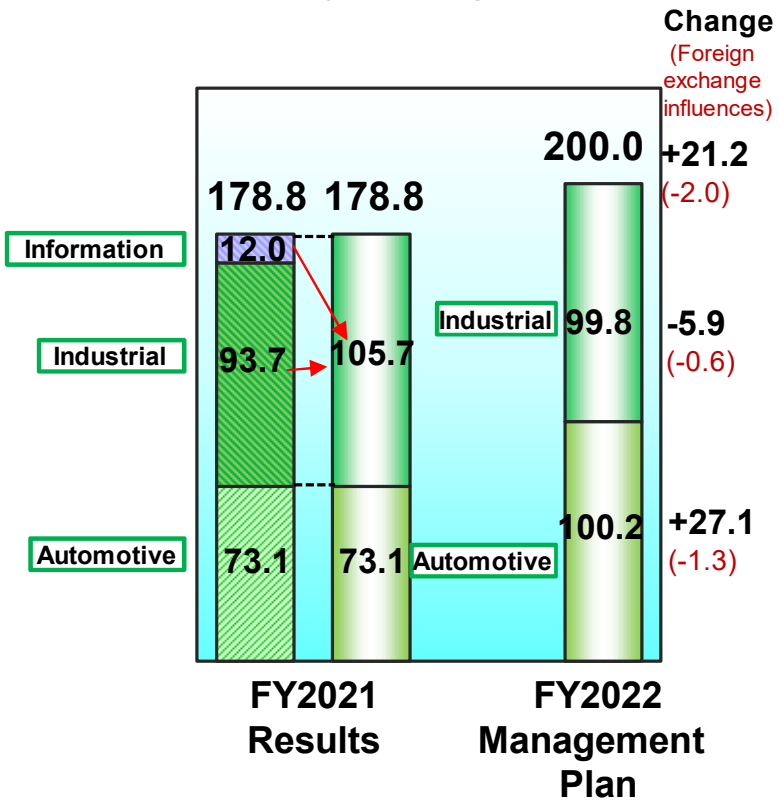
Business Policies

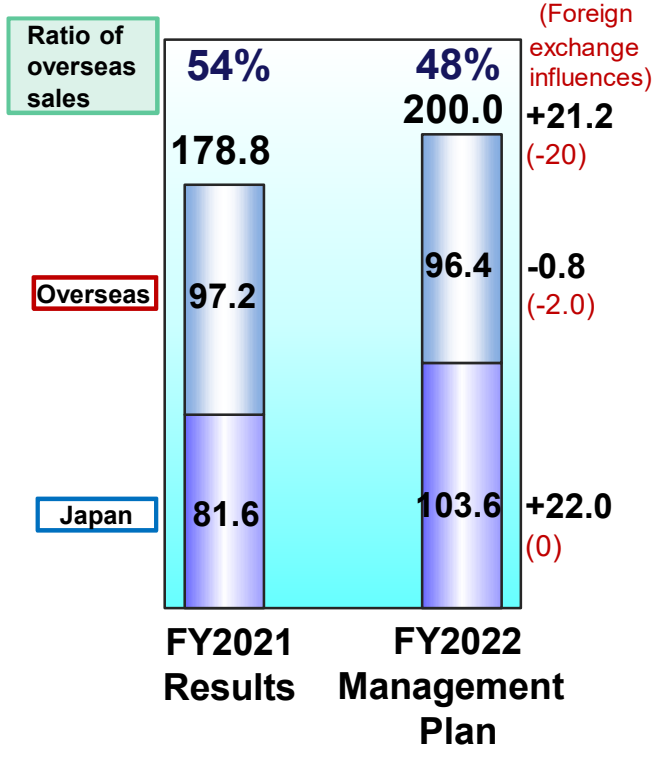
Continuation of proactive investment and pursuit of sales growth centered on semiconductors for xEVs

Business Plan

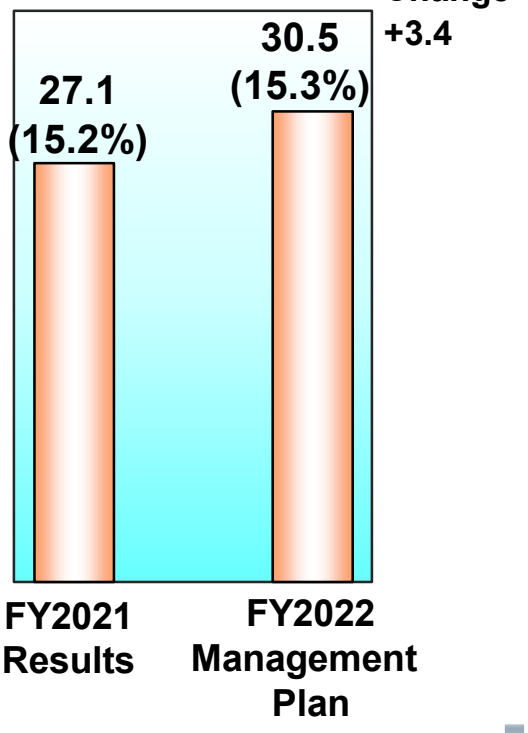
Net Sales by Subsegment (Billion yen)



Net Sales in Japan / Overseas (Billion yen)



Operating Income / Operating Margin (Billion yen)



Power Semiconductor Priority Measures

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- **Automotive field**
  - **Expansion of sales in growing xEV market**
- **Industrial field**
  - **Expansion of sales of 7th-generation IGBTs**
- **Enhancement of manufacturing**
  - **Front-end: Bolstering of 8-inch Si device production capacity**
    Construction of 6-inch SiC device mass production line
  - **Back-end: Augmentation of production capacity and expansion of range of products manufactured**
- **Development of competitive new products**
  - **Development of SiC devices and promotion of Fuji Electric's specifications**
  - **Technological development of 8th-generation IGBTs**

Growing xEV Market and Adoption of New Products

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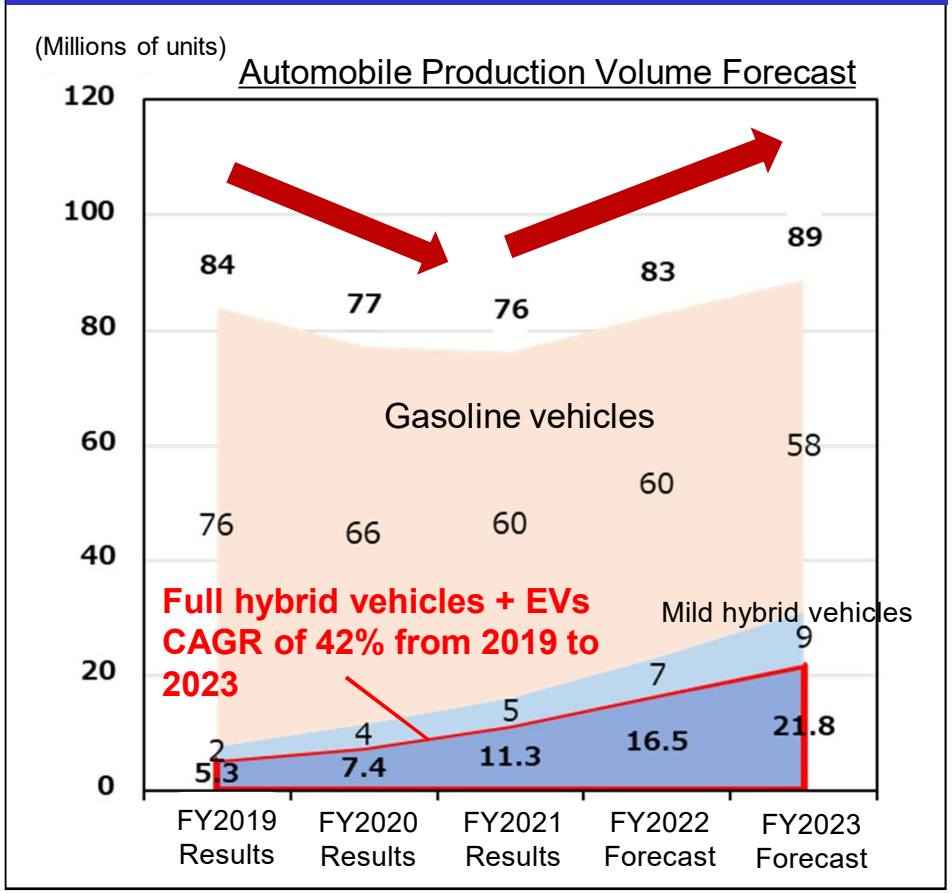
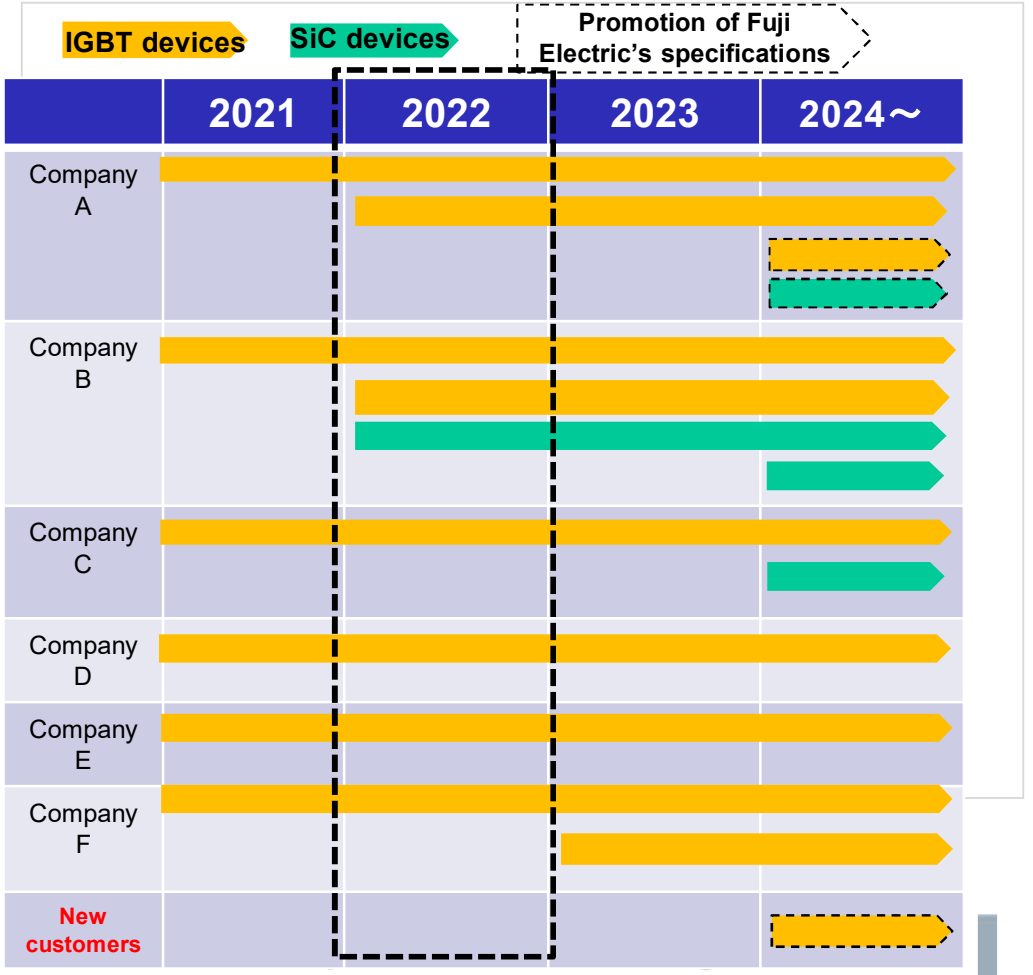
- **Flat growth in gasoline vehicle market due to decarbonation, ongoing growth of xEV market**
- **Increased adoption of Fuji Electric products in new vehicles and launches of new products in FY2022, advancement of campaigns to encourage use of Fuji Electric's specifications underway**

Automobile Market Trends



Note: EV production represents Fuji Electric's estimates based on projections by investigation firms and uses the total of full hybrid vehicles and EVs.

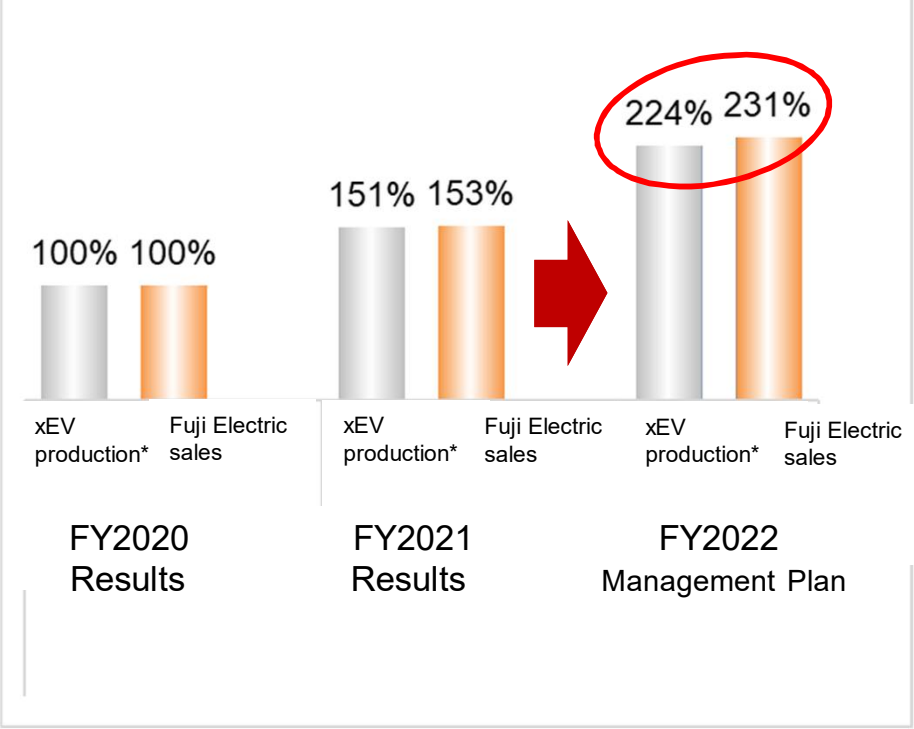
Adoption of New IGBT and SiC Products for xEVs



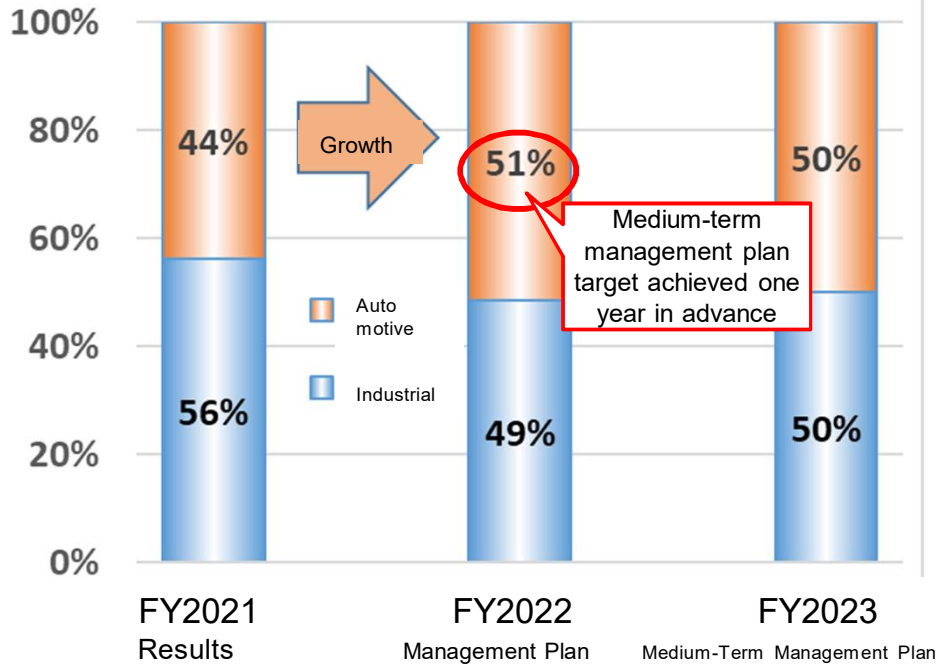
xEV IGBT Sales Targets

- **Target pursuing sales growth exceeding xEV market growth rate**
- **FY2022 expected to raise ratio of sales from automotive semiconductors from 44% to 51%**

xEV Production and Fuji Electric's IGBT Sales Targets



Breakdown of Automotive IGBT Sales by Field (Excluding the old information field)



Note: Figures use the total of full hybrid vehicles and EVs.

SiC Market Trends and Fuji Electric's Initiatives

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- **Massive benefits of using SiC devices in EVs**
- **SiC device market anticipated to see growth driven by products for EVs beginning after 2024**

Benefits of Using SiC devices in EVs

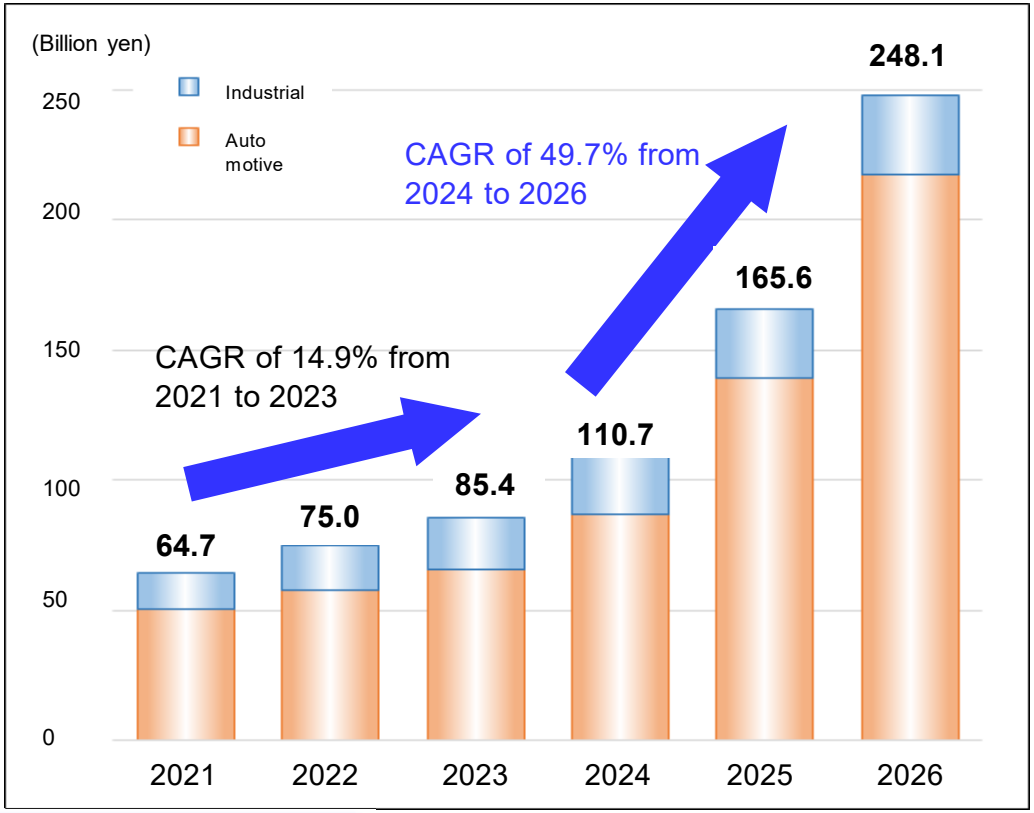
◆ **Reduced system costs**
Lower battery capacity and battery costs
Improvement of driving distance versus battery capacity

◆ **Reduction of greenhouse gas emissions**
⇒ Lower inverter loses

◆ **Reduction of vehicle weight through lower battery capacity**
⇒ Increased driving distance

◆ **Higher layout freedom and increased in-vehicle space made possible by smaller inverters**

SiC Module Market Forecast



Source: Fuji Electric's estimates based on multiple market data

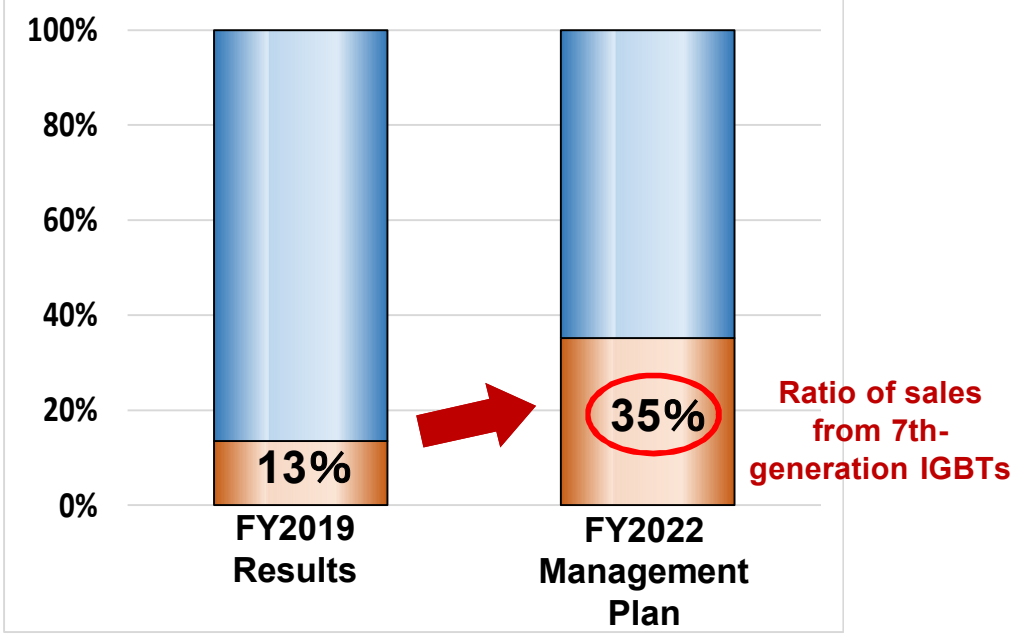
⇒ **Preparation for mass production at Fuji Electric Tsugaru Semiconductor beginning in FY2024**

⇒ **Development of competitive next-generation products**

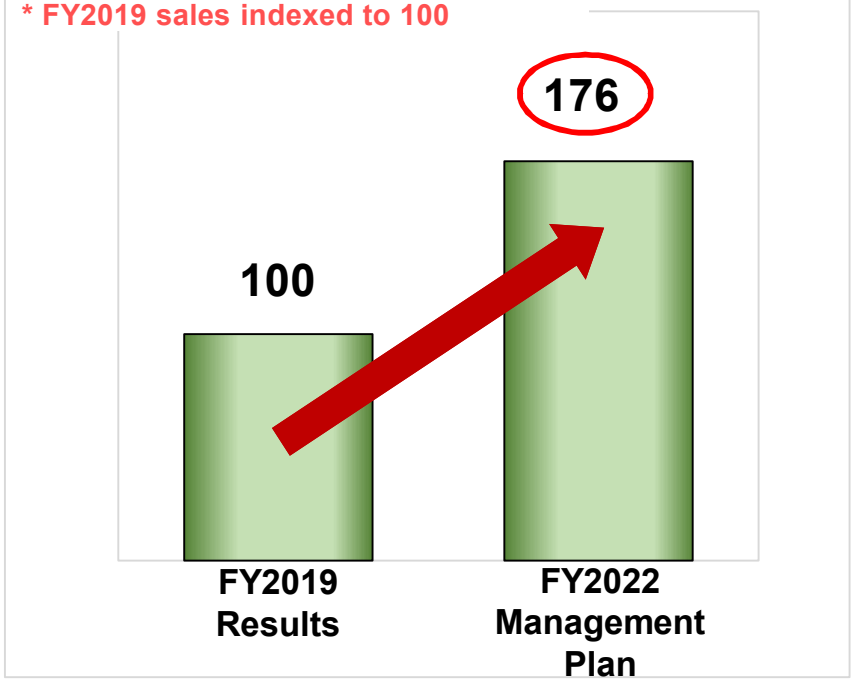
Industrial Module Sales Targets

- **Expansion of sales from 7th-generation IGBTs (ratio of total sales triple that of FY2019)**
- **Ongoing growth of sales of products for renewable energy and air-conditioning applications (roughly double FY2019)**

Ratio of Sales from 7th-Generation IGBTs



Sales of Products for Renewable Energy and Air-Conditioning Applications



Enhancement of Manufacturing—Production Bases and Measures (Front-End)

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Bases

Japan (Matsumoto)

- Mother factory
- Expansion of 8-inch wafer production capacity
- SiC device production base

Japan(Yamanashi)

- Principal 8-inch wafer factory
- Production of automotive IGBTs and 7th-generation IGBTs

Japan (Tsugaru)

- Expansion of 8-inch wafer production capacity
- SiC device production base (mass production scheduled to begin in FY2024)

Malaysia

- Production of 6th-generation IGBTs
- Production of 8-inch wafers (mass production scheduled to begin in FY2023)

Measures

- **Ongoing expansion of 8-inch wafer production capacity (50% year-on-year increase on March 31, 2022)**
- **Preparation for capacity increase aimed at FY2023 and beyond (including for SiC devices)**

8-Inch Wafer Production Capacity Plan

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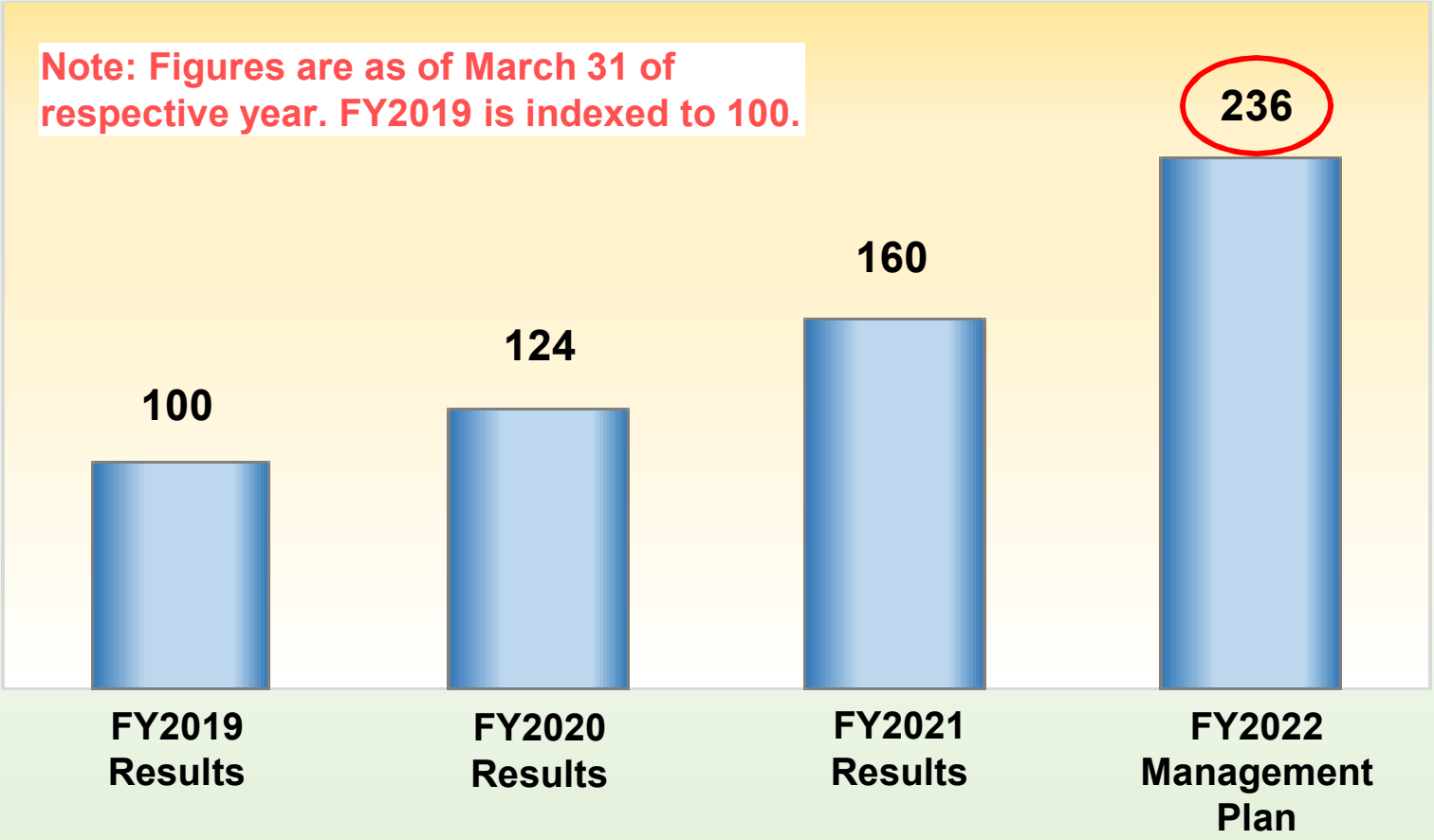
Doubled production capacity to be achieved in comparison to FY2019

Front-End 8-Inch Wafer Production Capacity



Enhancement of Manufacturing—Production Bases and Measures (Back-End)

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Bases

Japan (3 bases)

・Mother base for assembly products, manufacturing of products for domestic customers, expansion of module production capacity

Philippines

・Principal discrete device production base, production of automotive pressure sensors and air-conditioner modules

China (Shenzhen)

・Production base for IGBT modules for Chinese market, expansion of 7th-generaiton IGBT production capacity

Malaysia

・Industrial IGBT module production base, expansion of 7th-generaiton IGBT production capacity

Measures

・Expansion of automotive product production capacity
xEV module production (50% increase from FY2021 level in FY2022)

・Expansion of production capacity and range of models manufactured for industrial modules
7th-generation IGBT production (30% increase from FY2021 level in FY2022)

Development of Competitive New Products 1—SiC Devices

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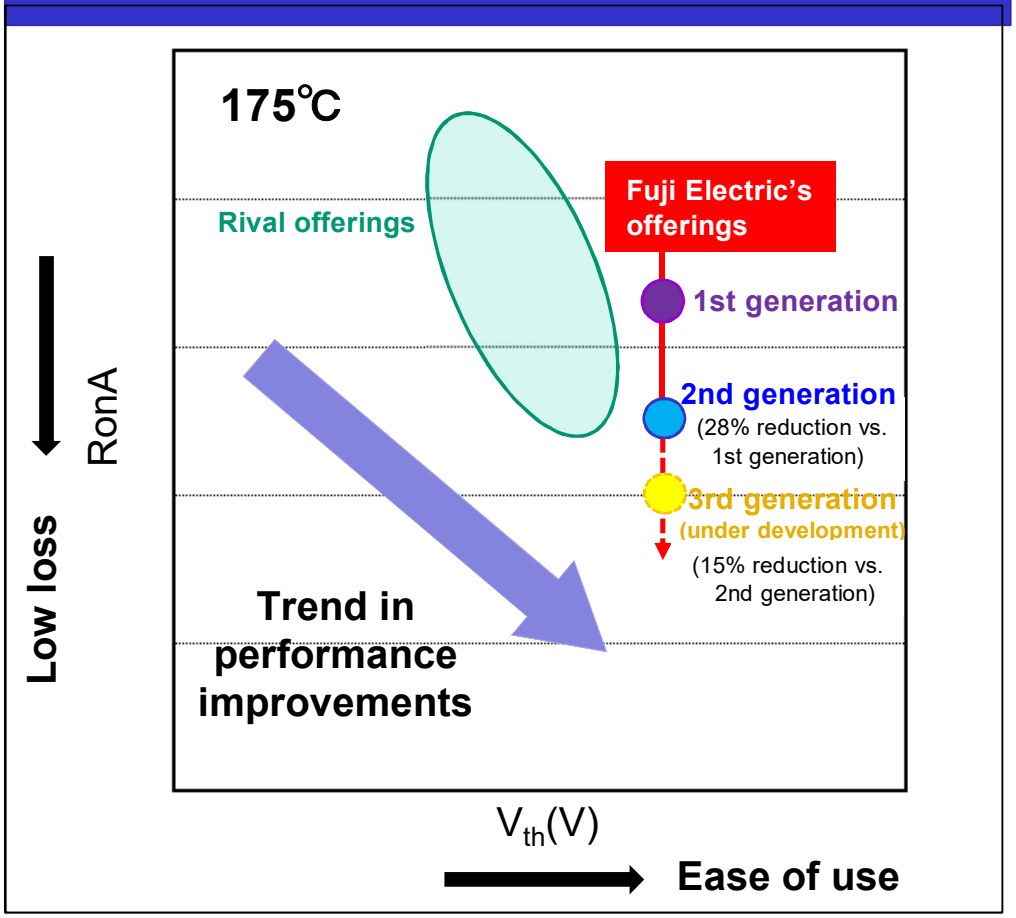
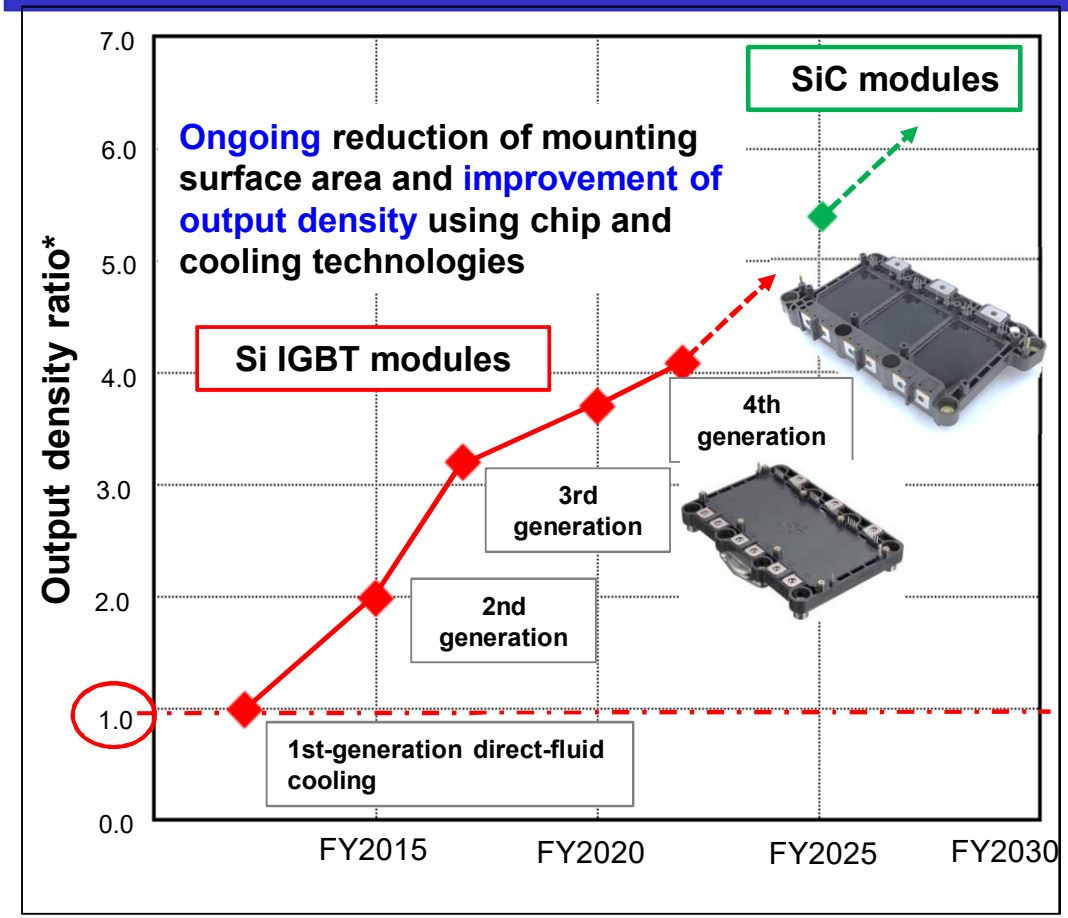
- **Development of SiC MOSFETs with focus on reducing loss while maintaining ease of use**
- **Application of SiC devices to increase module output density**

SiC MOSFET Performance Improvement Trends



xEV Module Performance Improvement Trends



* 1st-generation direct-fluid cooling indexed to 1

Development of Competitive New Products 2—IGBTs

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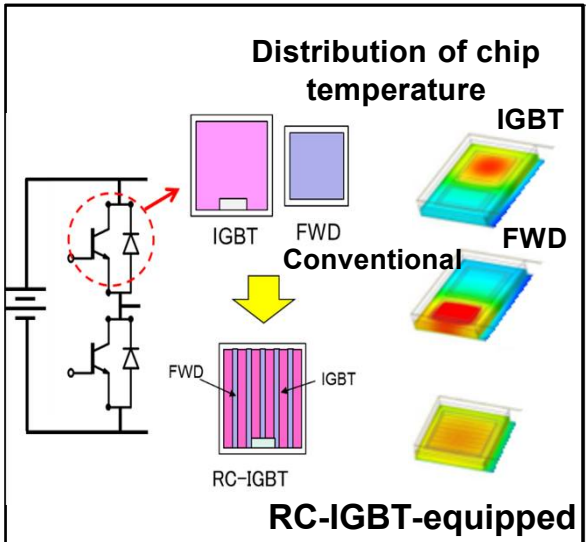
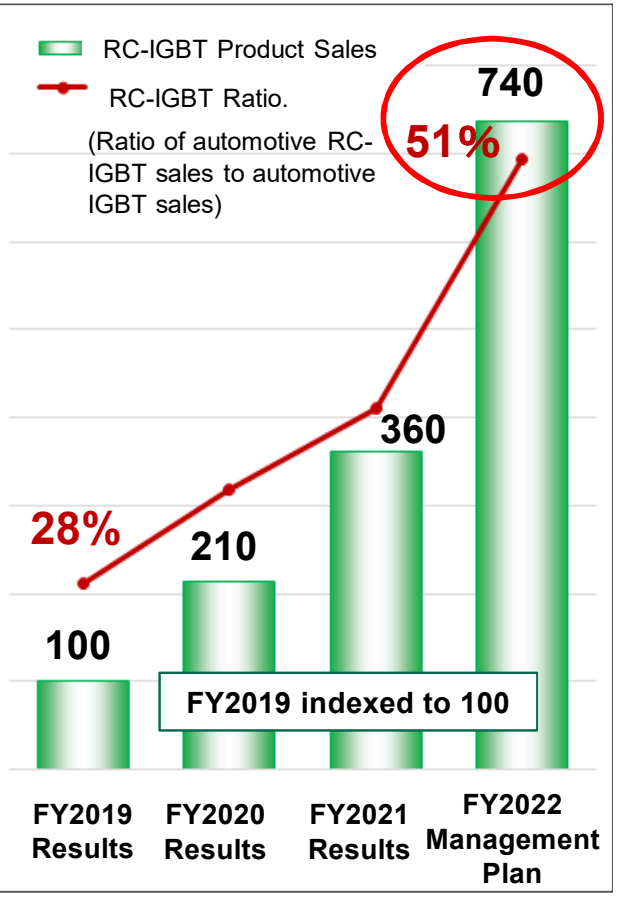
- **Expansion of automotive RC-IGBT sales by capitalizing on small size and high reliability**
- **Development of 8th-generation IGBTs underway targeting mass production after FY2024**

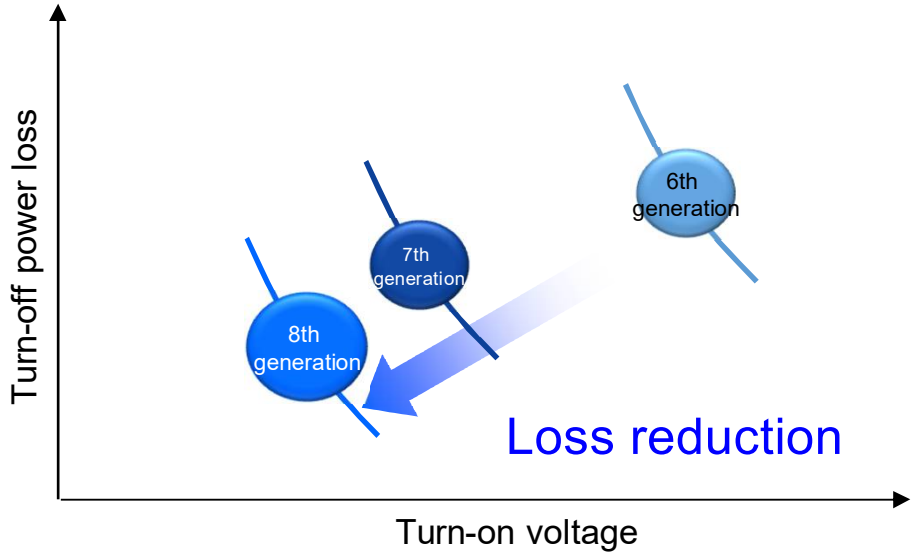
Features of RC-IGBT and Automotive Sales Trends and Ratio



【Benefits of utilizing RC-IGBTs:】
- **Chip mounting area: 25% reduction ⇒ miniaturization**
- **Chip heat generation: 33% reduction ⇒ increased reliability**



Goals of 8th-Generation IGBTs



【Development Goals】
- Loss reduction → Energy conservation, efficiency improvement (15% improvement vs. 7th generation targeted)
- Output increase → Reduction of device size
- Lifespan extension → Long-term reliability improvement

Capital Investment / Research and Development

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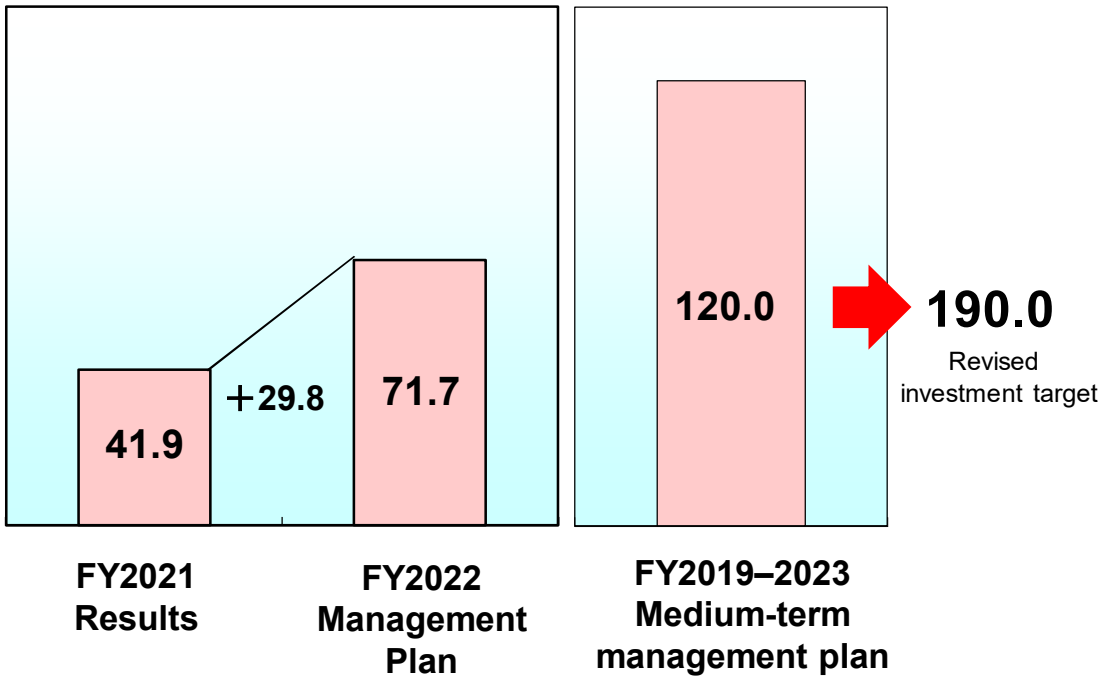
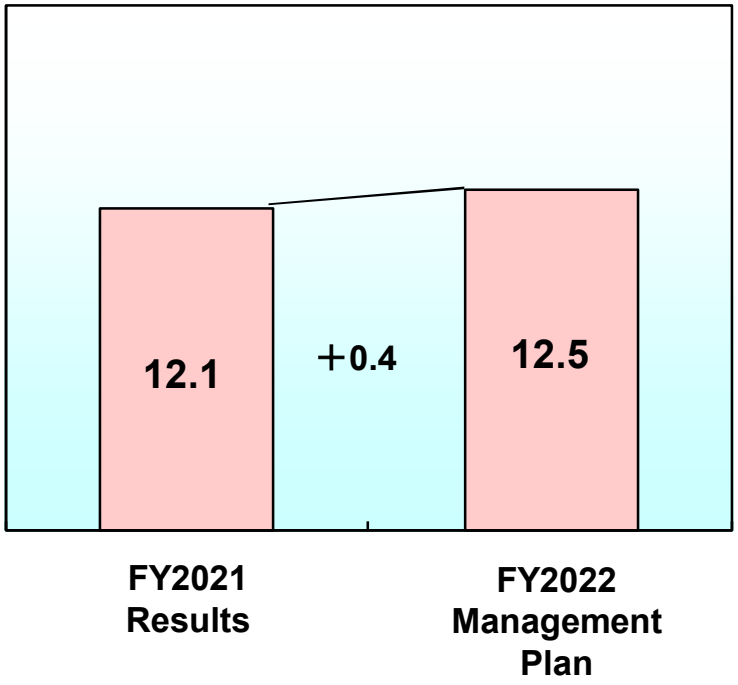
Capital Investment (Billion yen)



- Expansion of front-end (8-inch wafer) production capacity
- Expansion of back-end (automotive module) production capacity

Research and Development (Billion yen)



- Technological development of 8th-generation IGBTs
- SiC technology development
- Expansion of range of 7th-generation IGBT modules produced

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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