

# **FY2023 Medium-Term Management Plan**

## **Electronic Devices Business**

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# Electronic Devices

## Business Policy / Business Plan

### Business Policy

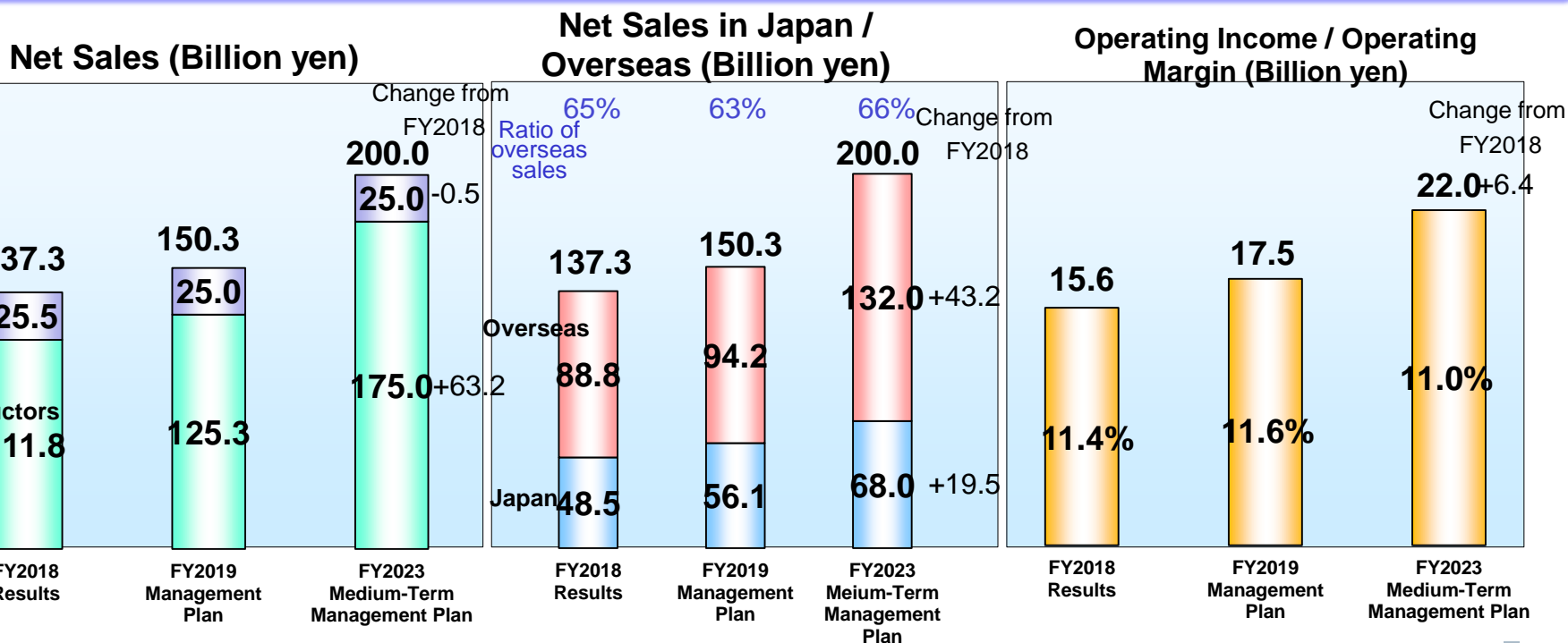
Increase sales and income through a focus on mainstay IGBTs and proactive investment in growth market

### Business Plan

#### FY2023 targets

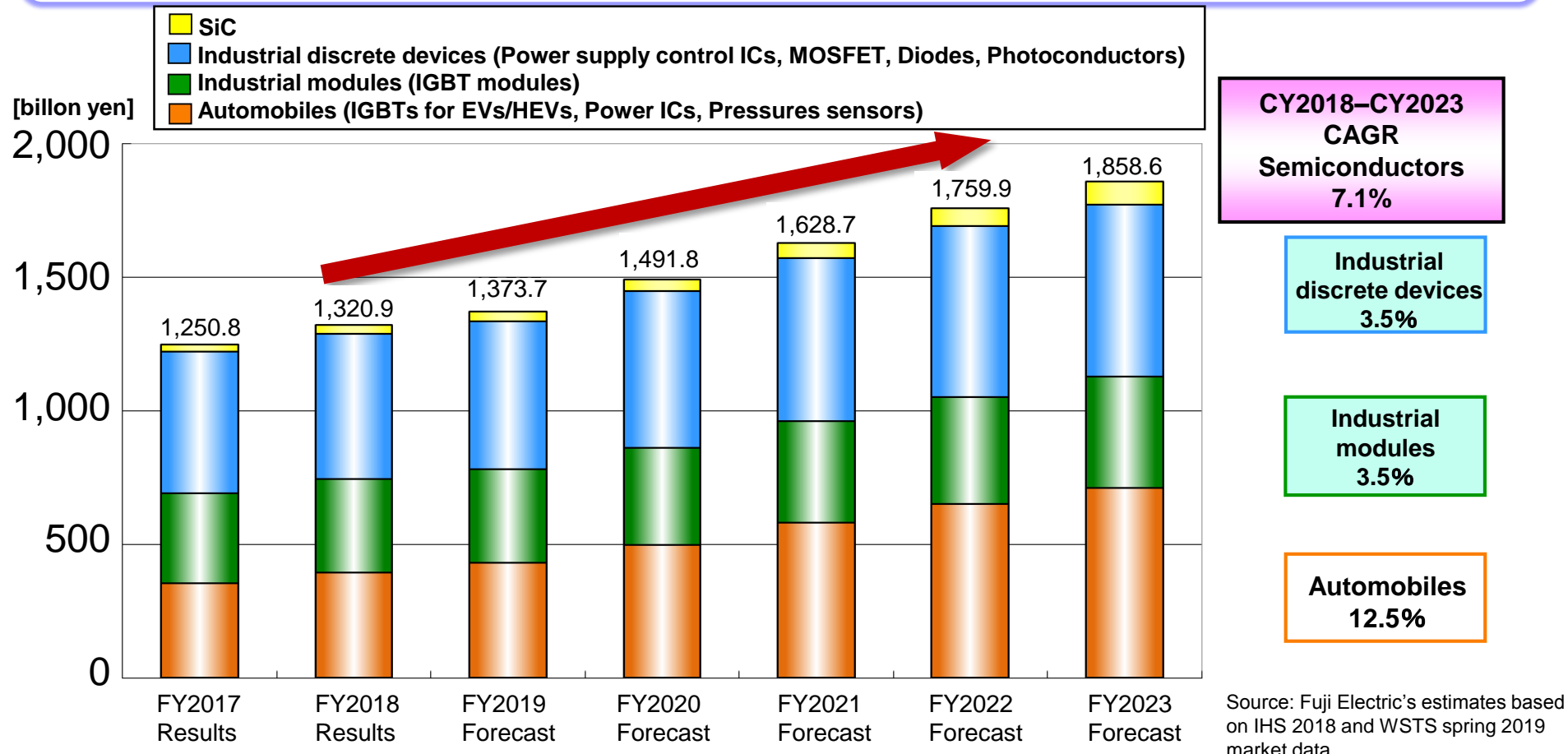
Net sales: ¥ 200.0 billion; Ratio of overseas sales: 66%

Operating income: ¥ 22.0 billion; Operating margin: 11%



# Power Semiconductor Market Forecasts (Market Segments Targeted by Fuji Electric)

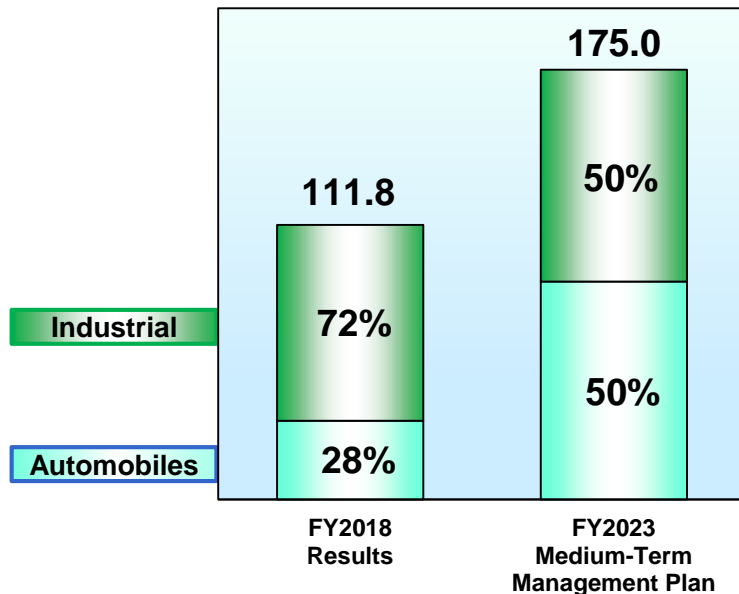
- Annual growth of **approximately 7%** in overall semiconductor market
- Strong annual growth of **approximately 13%** projected in automobile market



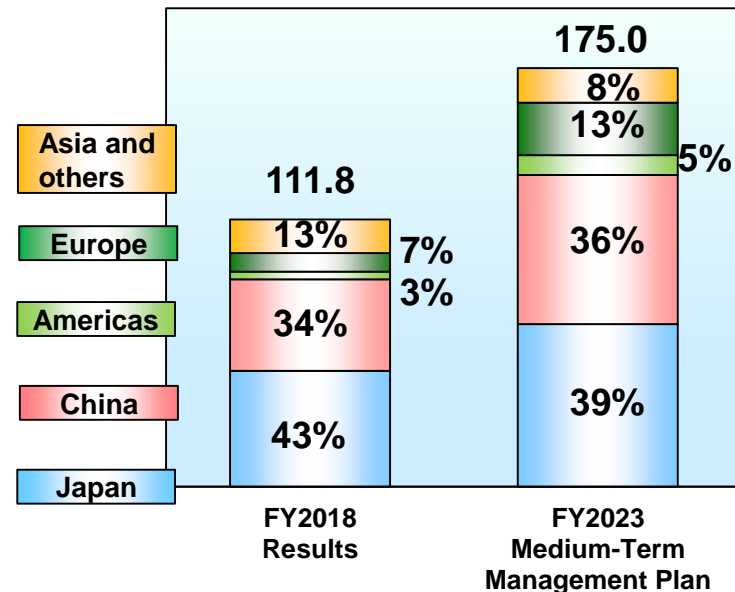
# Semiconductors Business Plan

- **FY2023 Target: Net sales of ¥175.0 billion**
- **Expansion of sales to automotive market**  
(Ratio of sales to automotive market: 28% in FY2018 → 50% in FY2023)
- **Growth of overseas sales**  
(Ratio of overseas sales: 57% in FY2018 → 61% in FY2023)

Net Sales by Business Fields  
(Billion yen)



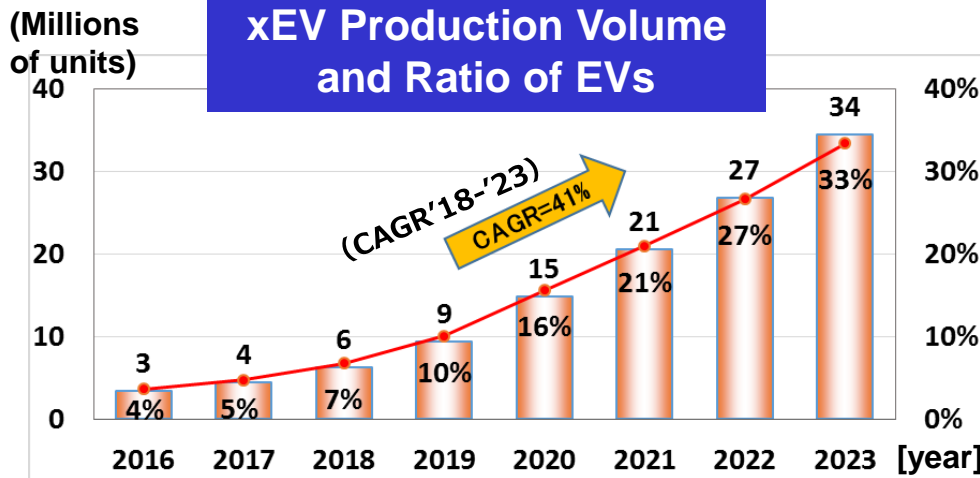
Net sales in Japan / Overseas  
(Billion yen)



- **Automotive field: Increase sales of products for EVs**
  - **Bolster product competitiveness through application of RC-IGBTs\***
  - **Commence mass production of 4th-generation direct liquid-cooling modules** \* Reverse conducting Insulated Gate Bipolar Transistor Modules, combining IGBTs and diodes
- **Industrial field: Increase sales in growth markets**
  - **Grow sales of products for renewable energy applications (large capacity) and for air conditioner market (small capacity)**
  - **Bolster sales of 7th-generation IGBTs**
- **Enhance manufacturing capabilities**
  - **Boost 8-inch wafer production capacity and promote automation and in-house production**
  - **Expand overseas production in back-end processes (assembly)**
- **Create new competitive products**
  - **Accelerate development of products utilizing RC-IGBTs**
  - **Shift resources to automotive field**

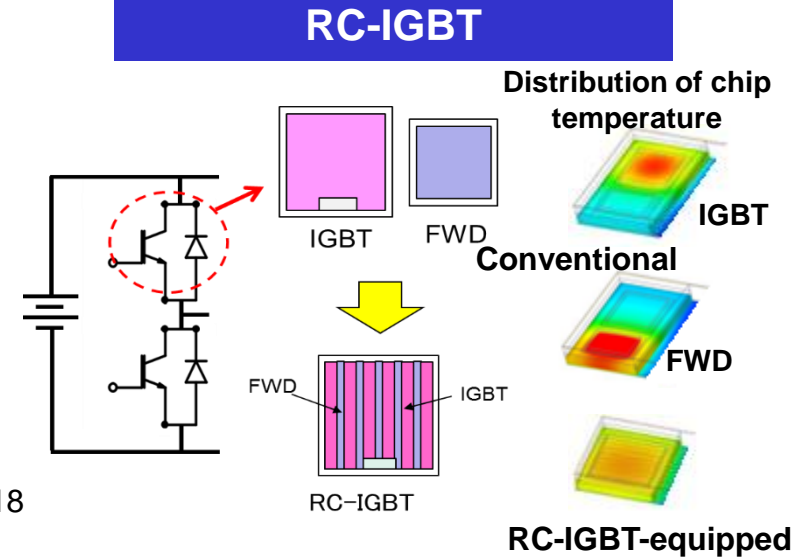
# EV Market Trends and Fuji Electric's Initiatives

- Annual market growth rate of 41% projected
- Differentiation to be pursued with 4th-generation direct liquid-cooling modules and RC-IGBTs



Source: IHS2018

**4th-generation direct liquid-cooling module**



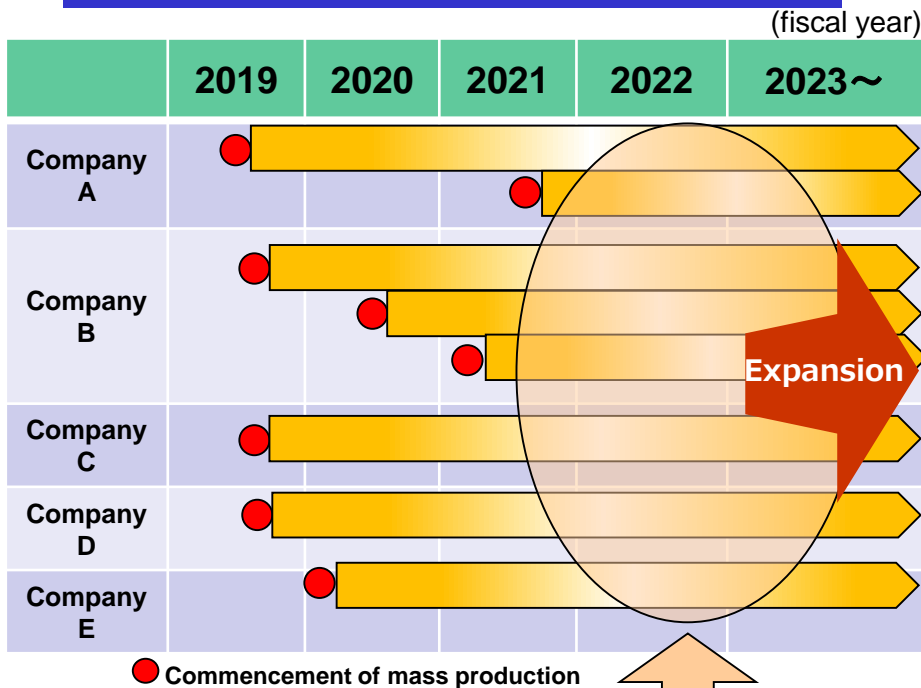
**Benefits of utilizing RC-IGBTs:**

- Chip mounting area: 25% reduction\* (miniaturization)
- Chip heat generation: 33% reduction\* (increased reliability)

\* Comparison between IGBT+FWD and RC-IGBT under theoretical conditions

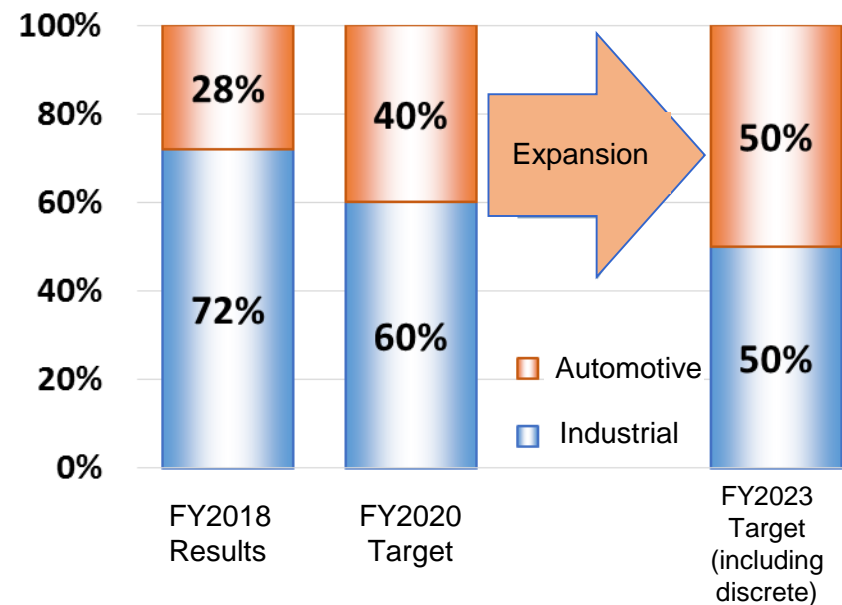
- Expand of sales with new IGBT product
- Grow sales of products for automotive applications to represent 50% of all semiconductor sales

## Plan for Growing Sales of New Automotive IGBT Products

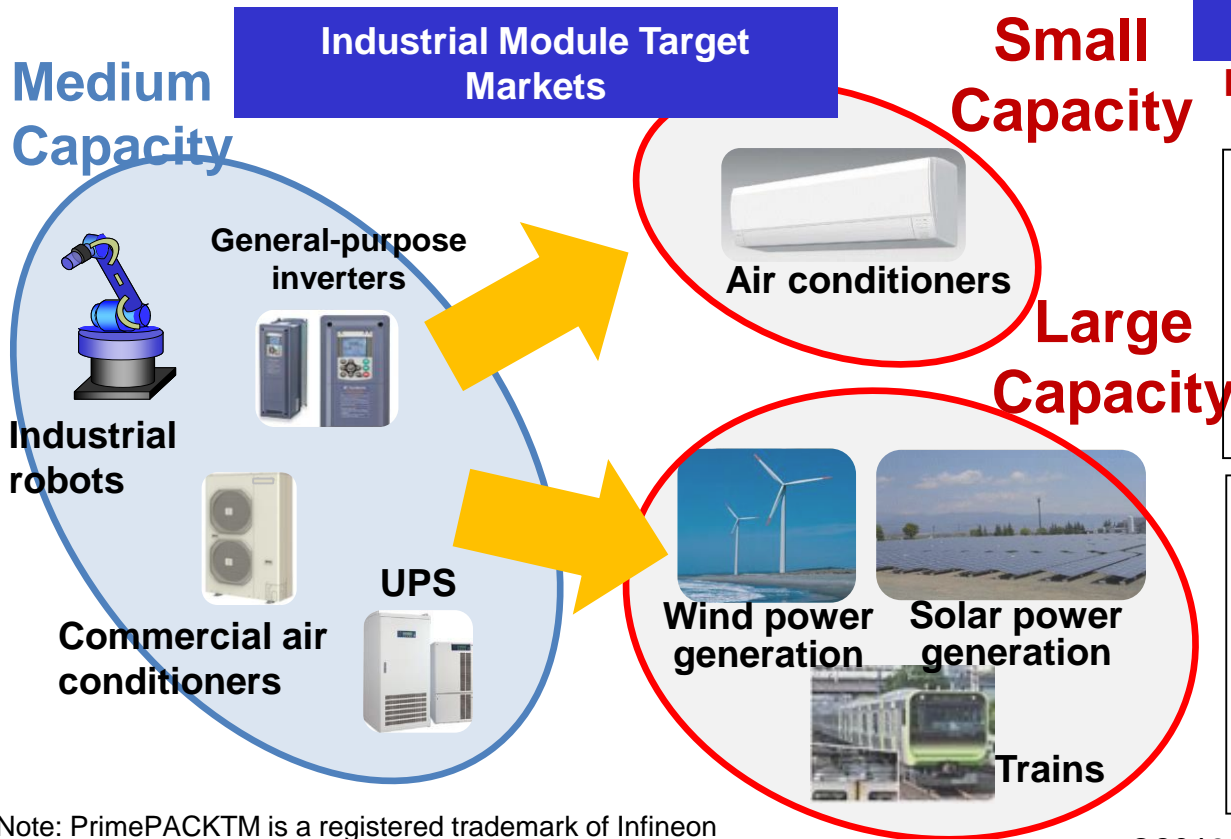


**Systematic introduction  
of new products**

## Ratio of Sales from Products for Automotive Applications

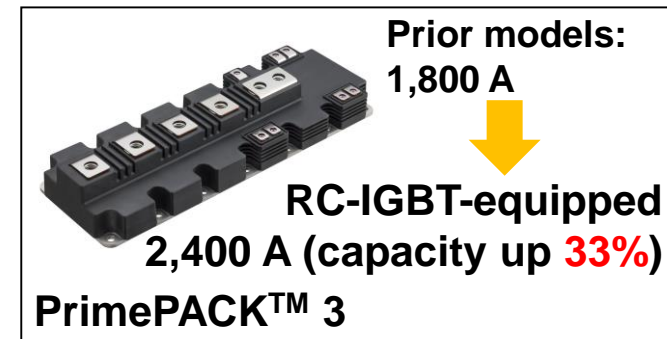
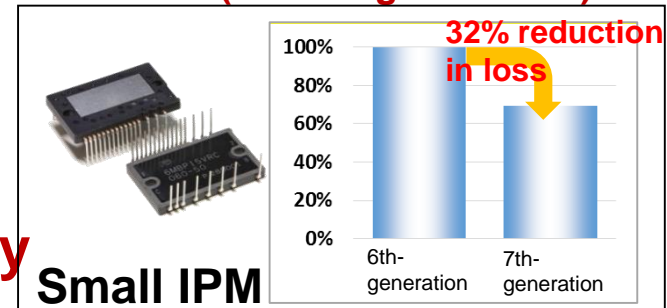


- Work to have proposed specifications accepted by utilizing 7th-generation IGBTs (low loss, high efficiency) and RC-IGBTs (miniaturization, high reliability)
- Develop series of large-scale package offerings employing 7th-generation IGBTs for air conditioner market
- Employ RC-IGBTs for the renewable energy market and introduce additional proprietary Fuji Electric products with large capacities



## 7th-Generation IGBT Products

Benefits of employing 7th-generation IGBTs (including RC-IGBTs)

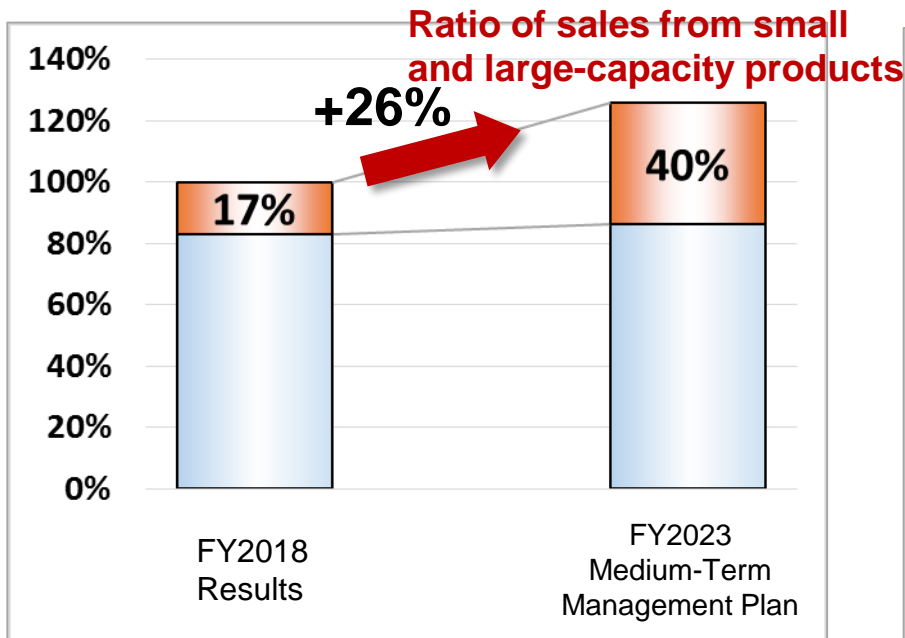




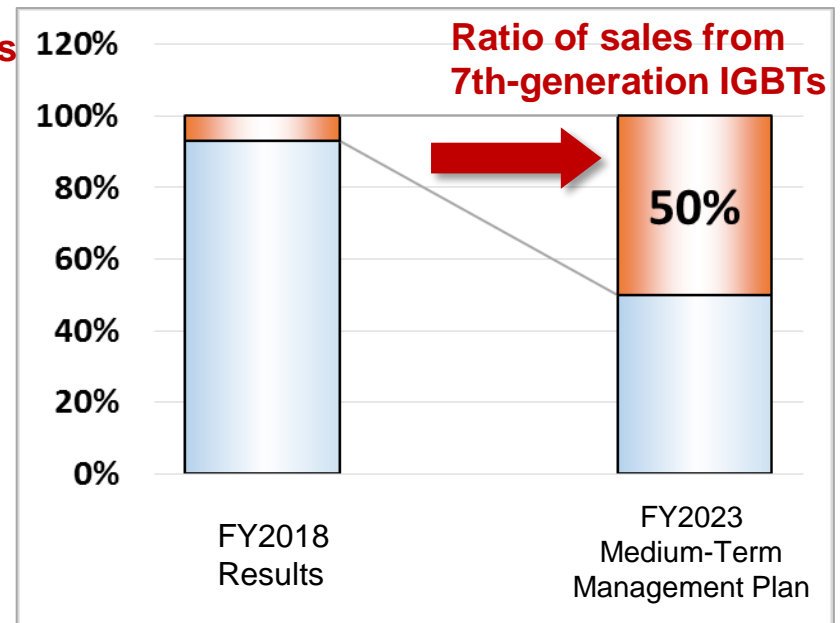
# Industrial Module Sales Targets

- Achieve 26% increase in industrial module sales from FY2018 (FY2023)
- Raise sales of small- and large-capacity products to represent 40% of total sales (FY2023)
- Increase sales of 7th-generation IGBTs to represent 50% of total sales (FY2023)

## Industrial Module Sales Plan



## 7th-Generation IGBT Sales Plan

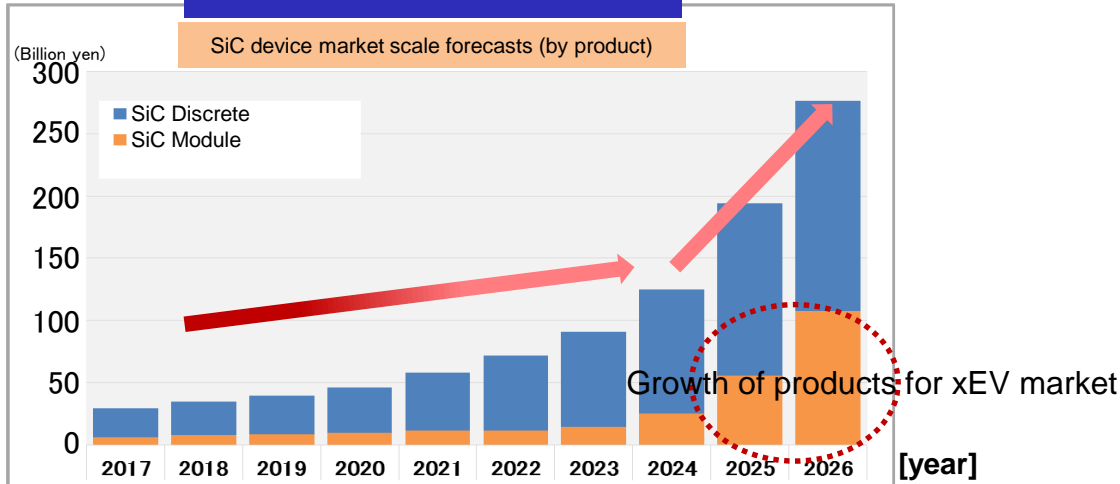


\* Ratios of sales from small and large-capacity products are calculated using FY2018 as the base year.

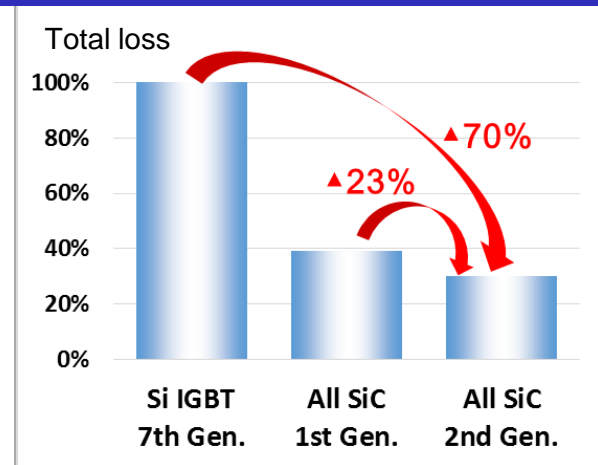
# SiC Development

- Introduce additional package series matched to applications
- Expand sales with 2nd-generation trench MOSFETs (featuring 23% less loss than 1st generation)

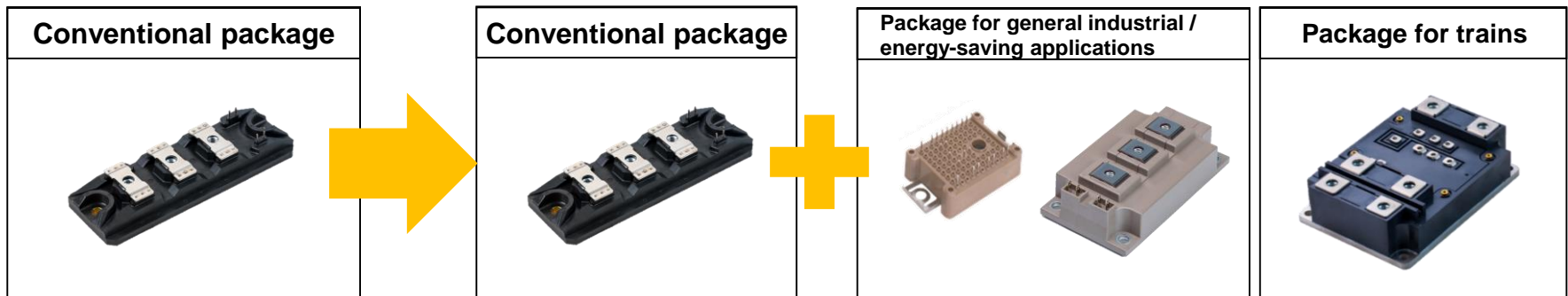
## Market Trends



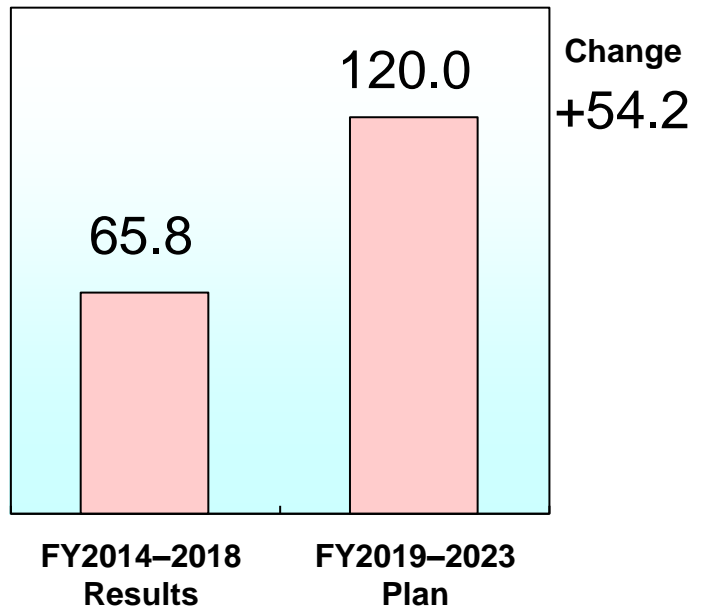
## Performance of 2nd-Generation Trench MOSFETs



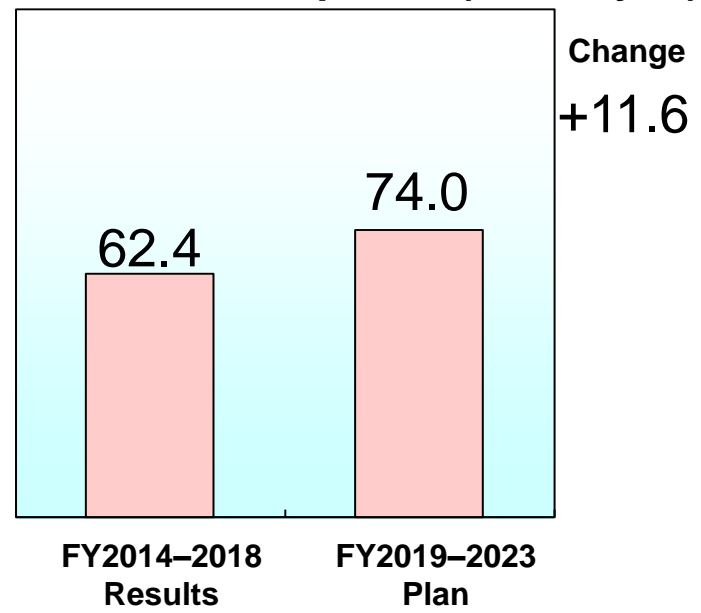
## Application-Specific Packages



**Capital Investment (Billion yen)**



**Research and Development (Billion yen)**



**Semiconductors**

- Rationalization and production capacity increases
  - Front-end: Expansion of 8-inch wafer production (3 times higher than in 2018)
  - Back-end: Automotive IGBTs, discrete devices, and industrial IGBTs (large capacity, air conditioners)
- Expansion of overseas production

**Semiconductors**

- Automotive IGBTs and discrete devices
- Expansion of 7th-generation IGBT series
- Development of 8th-generation IGBT technologies
- SiC devices and modules

Note: 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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