



# Ferrotec Holdings Corporation

## New Mid-Term Management Plan (FY3/22-FY3/24)

Revised figures as of Tuesday, June 8, 2021 have been reflected.

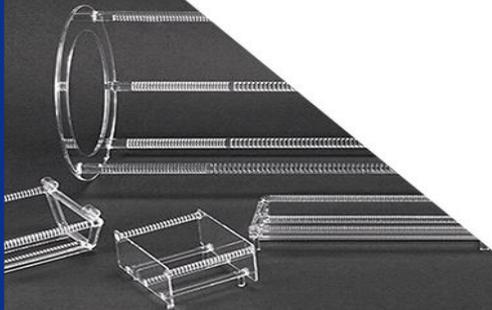
Fri. May 28, 2021



**FerroTec**  
Ferrotec Holdings Corporation



## Review of FY3/21



## Business results/dividends

### **For FY3/21, operating income and net income grew considerably from the previous term.**

The demand for semiconductors was healthy, and performance improved. (Annual operating income rose 60% and net income increased 364%.)

The annual dividend increased from 24 yen/share in FY3/20 to 30 yen/share (including the commemorative dividend of 4 yen/share) in FY3/21 thanks to the improved performance.

## Product strategy

### **To strengthen strategic products, including materials, cleaning, power semiconductor substrates, and wafers**

The sales and profits from quartz, ceramics, silicon parts, and cleaning increased, and their production output was raised proactively. For power semiconductor substrates, we established a system for increasing the output of AMB in addition to the upgrade of the system for increasing the output of DCB, with the aim of taking advantage of the growth of the EV market. Our wafers were steadily approved by customers. The capital increase through third-party allotment and the system for increasing the output of 12-inch wafers (200,000 wafers per month) will be completed.

## Capital investment

### **For FY3/21, it was 14.2 billion yen (estimate: 29.4 billion yen), reaching 49% of the estimate.**

Down 15.2 billion yen from the estimate: The effect of exclusion of the subsidiary producing wafers from the scope of consolidation: 5.2 billion yen; equipment-related accounts payable as of the end of FY3/21: 8.2 billion yen

Active investment in recycled wafers, SiC, etc. in addition to materials, cleaning, and power semiconductor substrates, whose demand is strong

## Fund procurement

### **Improving the Group's financial position and utilizing Chinese capital**

The subsidiaries producing semiconductor wafers and single-crystal SiC became equity-method affiliates. Our company conducted joint investment with Chinese capital, sharing the burden of investment.

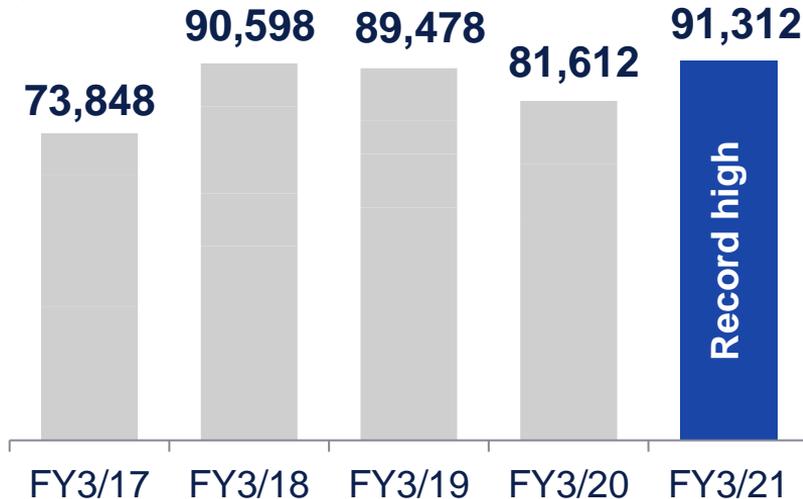
The consolidated subsidiaries in charge of cleaning, power semiconductor substrates, silicon parts, and crucibles remained unchanged. We aim to procure funds and get the subsidiaries listed in China.

# Review of FY3/21: Sales hit a record high, and operating income recovered to the level in FY3/19

- ◆ Sales hit a record high, thanks to the favorable performance of semiconductor materials, parts cleaning, thermo-electric modules, etc.
- ◆ Operating income recovered, as the semiconductor market was healthy and the subsidiary producing silicon wafers was excluded from the scope of consolidation.

## Net sales

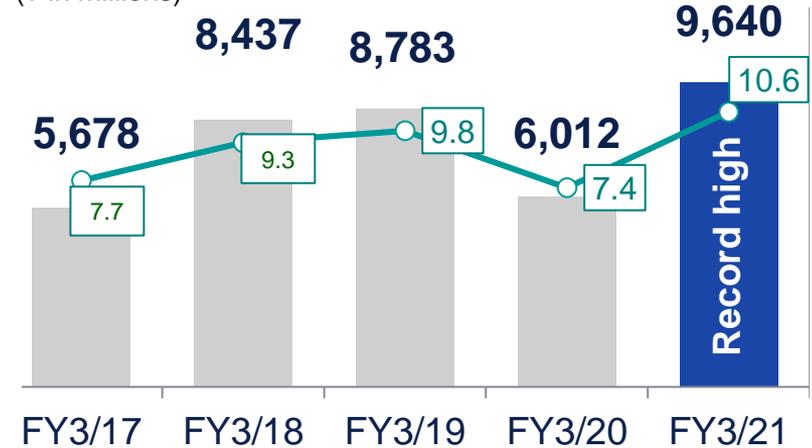
(¥ in millions)



## Operating income

(¥ in millions)

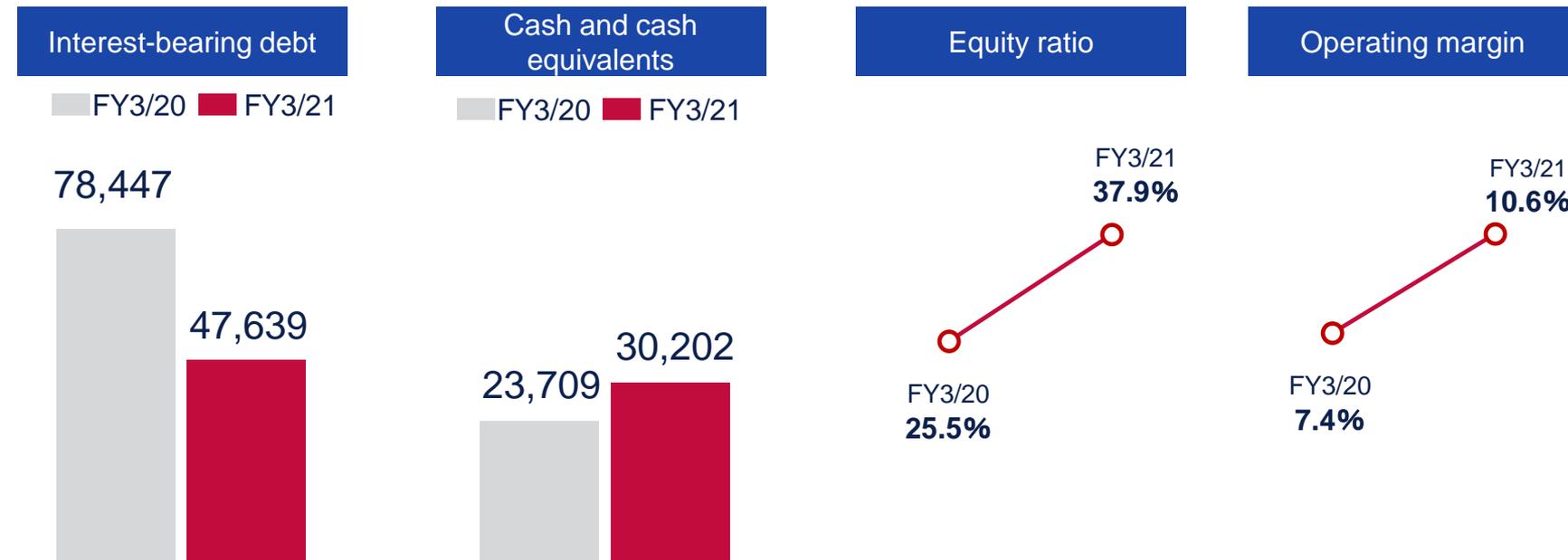
■ Operating income    ○ Operating margin



■ Major management indicators improved significantly, through the transformation of the wafer business subsidiary into an equity-method affiliate.

### Variations in key indicators

(¥ in millions)



We acquired enterprises in the global niche market as subsidiaries, formed alliances with some leading manufacturers in Japan, and strengthened our product lineup and business network.

■ **Acquisition of RMT Ltd. as a subsidiary**

A Russian enterprise producing micro thermo-electric modules  
To enrich our lineup of our thermo-electric modules



■ **Acquisition of MeiVac, Inc. as a subsidiary**

Acquired this company located in San Jose, the U.S. as a subsidiary.  
This company excels at forming thin films, and helped improve our technology and sales network for vacuum feedthroughs.



■ **Capital and business alliances with Ohizumi Mfg. Co., Ltd.**

Capital tie-up with Ohizumi Mfg. Co., Ltd. (Mothers of TSE) in preparation for full-scale entry to the Chinese market.  
To create a new business domain by combining Ohizumi's superior technology for temperature sensors for in-vehicle devices and air-conditioning and our thermo-electric module technology



■ **Capital and business alliances with cado Co., Ltd.**

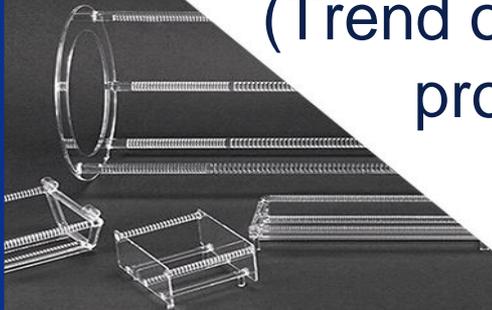
cado is a Japanese fabless company handling environment- and health-oriented home appliances with classy designs and advanced functions, including air purifiers.  
In cooperation with cado, we released consumer products utilizing the thermo-electric module temperature control technology (targeting the Japanese and Chinese markets).



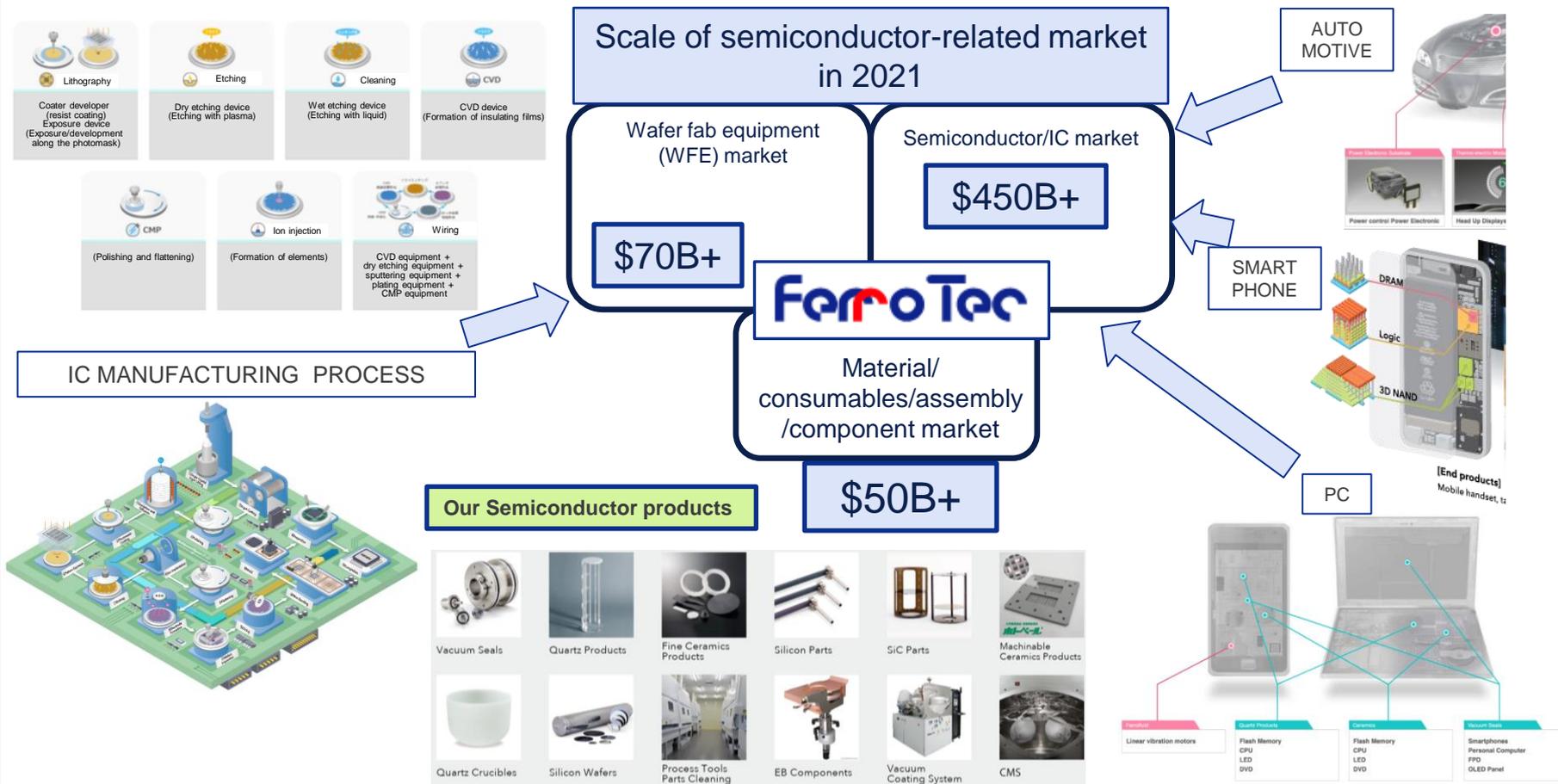
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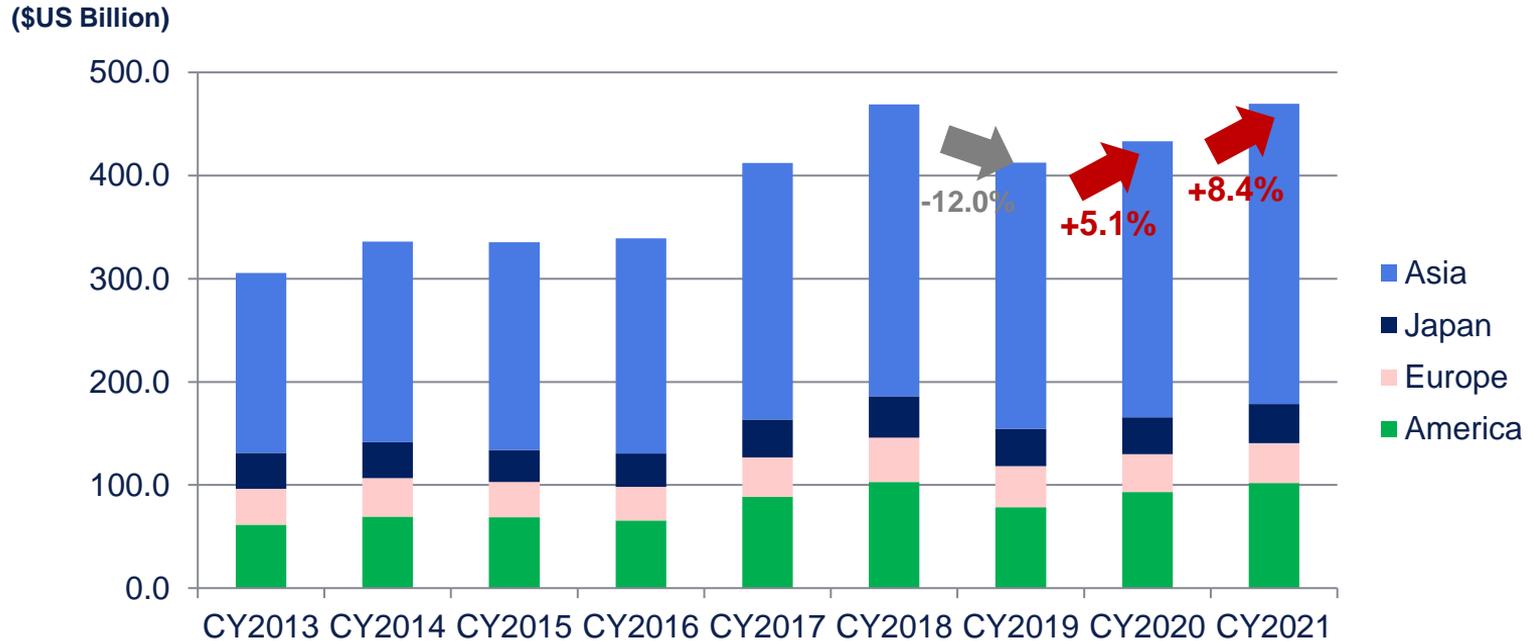
Recognition of the market environment  
(Trend of the semiconductor market and domestic  
production of semiconductors in China)



# Ferrotec Group's value chain in the semiconductor market



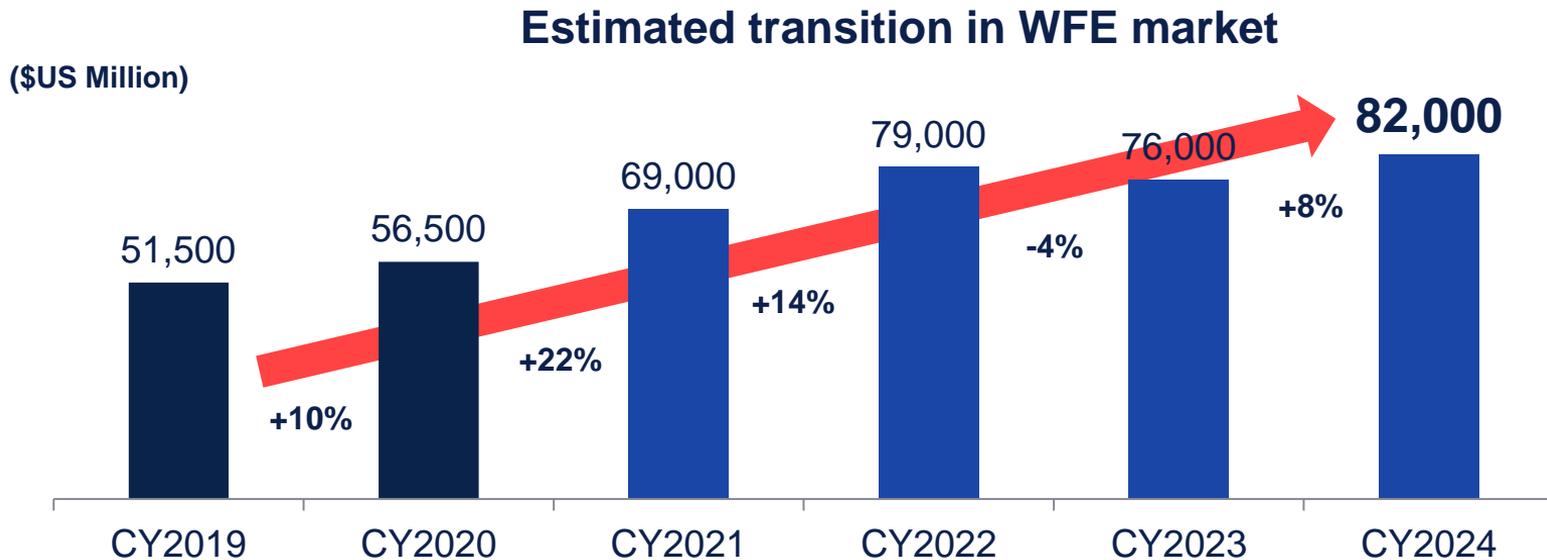
# Semiconductor market forecast by region: Robust with 5.1% YoY increase in 2020 and 8.4% YoY increase in 2021



	CY2013	CY2014	CY2015	CY2016	CY2017	CY2018	CY2019	CY2020	CY2021
Total IC	305.6	335.8	335.2	338.9	412.2	468.8	412.3	433.1	469.4
YoY growth (%)	4.8%	9.9%	-0.2%	1.1%	21.6%	13.7%	-12.0%	5.1%	8.4%

\*Prepared by our company based on the data published by the WSTS Japan Council (Dec. 2020).  
\*CY = Calendar year (CY2013 = 2013)

- The wafer fab equipment (WFE) market declined in 2019, but is expected to grow year by year from 2020 for the foreseeable future.

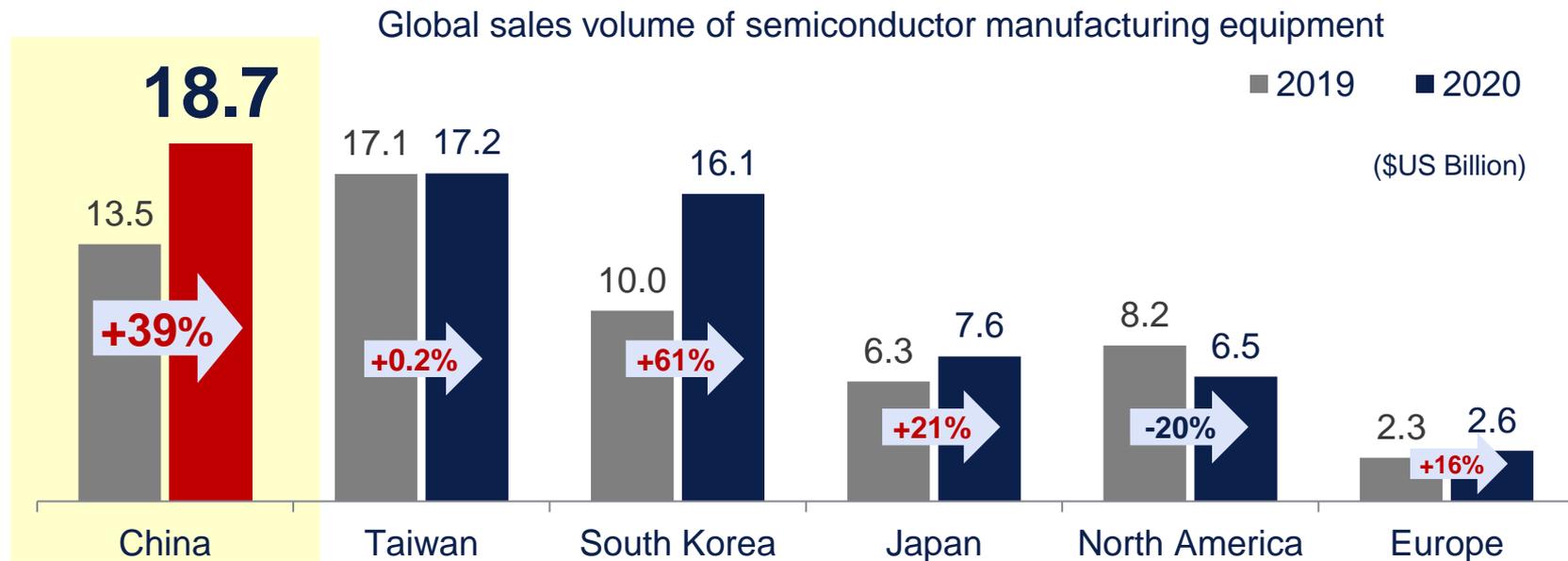


Prepared by our company based on research conducted by securities companies.

\*CY = Calendar year (CY2019 = 2019)

In 2020, the sales of semiconductor manufacturing equipment in China became the largest

- In 2020, the sales of semiconductor manufacturing equipment in China reached 18.72 billion US dollars, being the largest in the world.
- The YoY growth rate is as remarkable as 39%. The Chinese semiconductor market became the largest in the world (demand grew significantly).



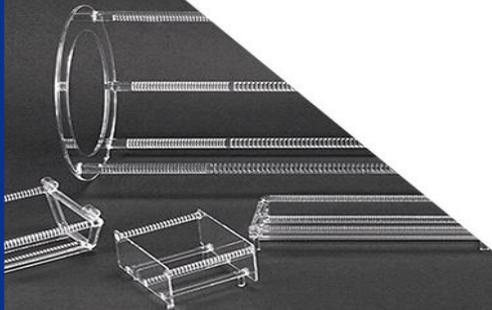
\*Prepared by us based on the release dated April 14 by SEMI.



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## Regarding the policy and basic strategy in the new mid-term management plan



## Business growth

**We will rigorously pursue the growth of business and profit, and continue investment for growth.**

- To invest for increasing production output in the promising fields of semiconductors and electronic devices, and increase our position
- To promote investment related to electric vehicles (EVs) for future growth

## Fortification of the financial standing

**We will fortify the financial standing, and secure an appropriate balance between investment opportunities and the financial status.**

- To use net income as a KPI, enhance the management of return on investment and ROIC, and appropriately discuss the utilization of external capital

## Quality improvement

**Considering that “quality is vital,” we will enhance quality control.**

- To upgrade our production system through quality control, automation, and digitization

## Strengthening of personnel

**We will strengthen personnel and reform organizational structures.**

- In order to achieve sustainable growth while our corporate scale is expanding, we will recruit and train personnel, reform our organizational structure, and foster our corporate culture.

## KPI Summary (Target for FY3/24)

**Net sales**  
**150 billion yen**

**Operating income**  
**25 billion yen**  
**(Operating margin: 16.7%)**

**Net income**  
**15 billion yen**  
**(Net income margin: 10.0%)**

**ROE**  
**15%**

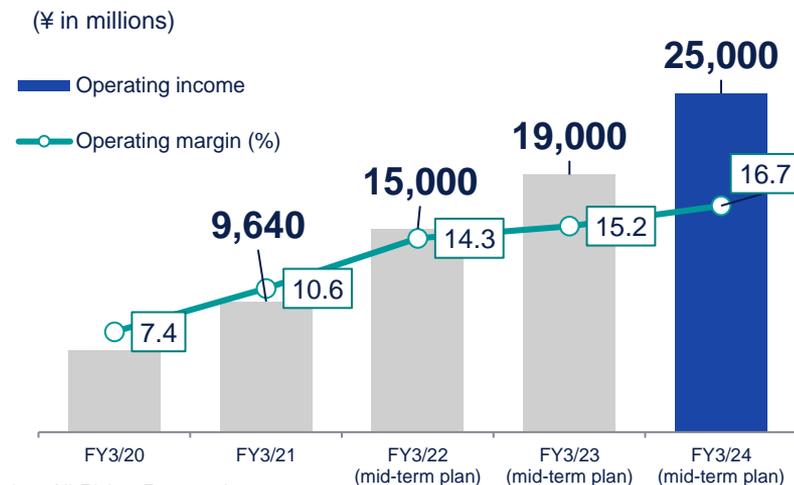
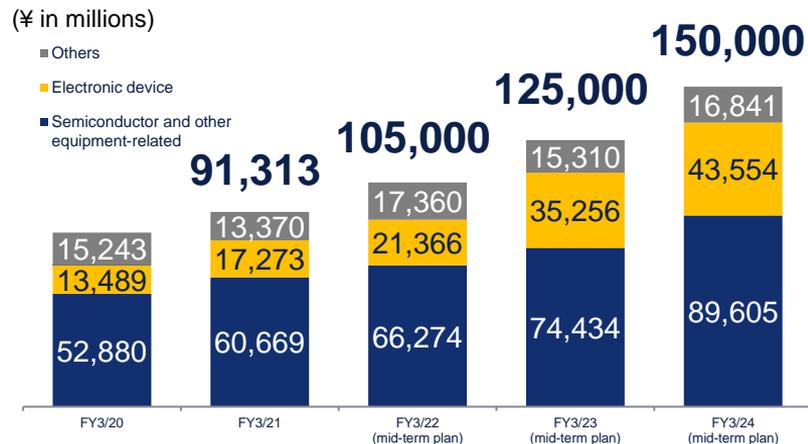
**ROIC**  
**8%**

**Equity ratio**  
**Over 40%**

- As the semiconductor market is expected to keep growing for the foreseeable future, we aim to achieve net sales amounting to 150 billion yen in the final fiscal year.
- We will establish an optimal business portfolio, and aim to achieve an operating margin of 16.7% in the final fiscal year.

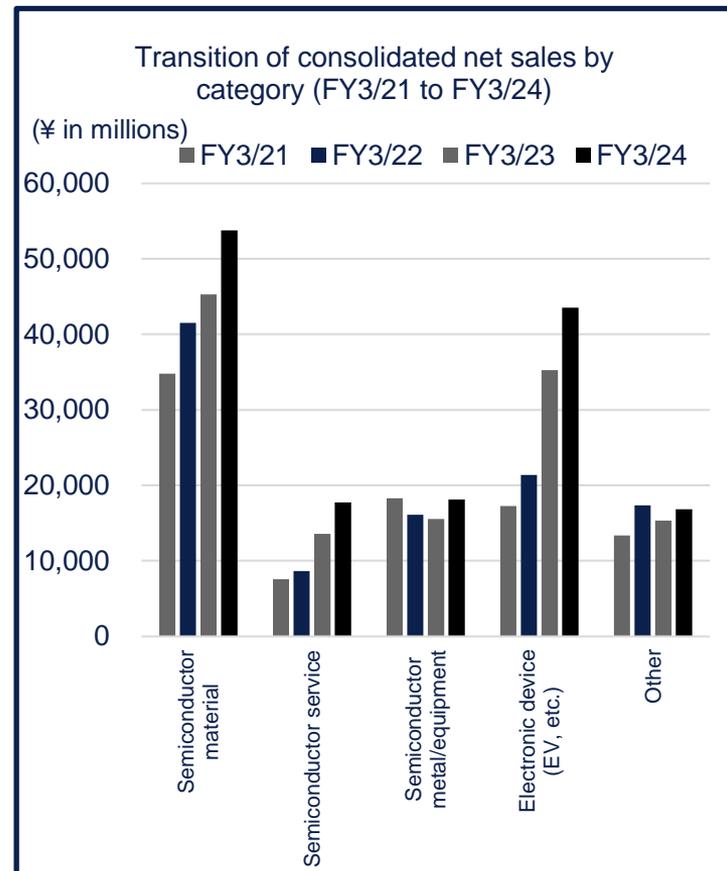
Net sales (FY3/24)  
**150 billion yen**

Operating income (FY3/24)  
**25 billion yen**  
(Operating margin: 16.7%)



# Target net sales by each category (FY3/24)

	Category	Products	Results for FY3/21	FY3/24 (Final fiscal year of mid-term plan)	Increase/decrease rate (between FY3/21 and FY3/24)
A	Semiconductor material	Quartz, ceramics, silicon parts, CVD-SiC, etc.	34,795	53,773	+54.5%
B	Semiconductor service	Parts cleaning, wafer recycling, etc.	7,579	17,717	+133.7%
C	Semiconductor metal/equipment	Vacuum feedthroughs, metal processing, deposition apparatus, etc.	18,295	18,115	-0.9%
D	Electronic device (EV, etc.)	Thermo-electric modules, power semiconductor substrates, ferrofluid, etc.	17,273	43,554	+152.1%
E	Other	Blades, cleaning, other manufacturing equipment, etc.	13,370	16,841	+25.9%
<b>A+B+C+D+E</b>	<b>Grand total (Consolidated net sales)</b>		<b>91,312</b>	<b>150,000</b>	<b>+64.2%</b>
A+B+C	Total of semiconductor equipment-related	Total of material/service/semiconductor metal/equipment	60,669	89,205	47.0%



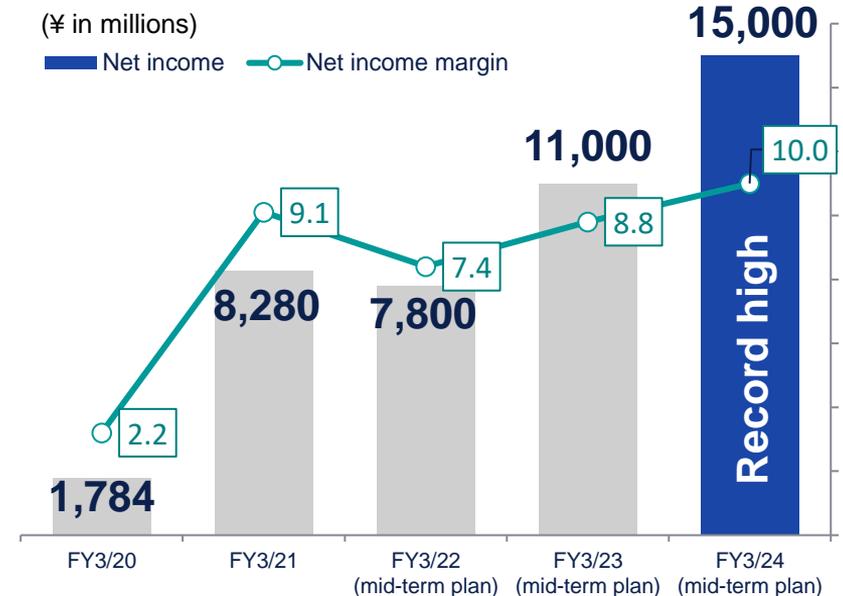
While putting importance on net income, we will increase profits and return to shareholders

- To recognize net income\* as a KPI, as it is the fund for return to shareholders (dividend)
- To enhance our earning capacity, improve our business performance, and increase return to shareholders.

**Net income\***  
(Target for FY3/24)

**15 billion  
yen**

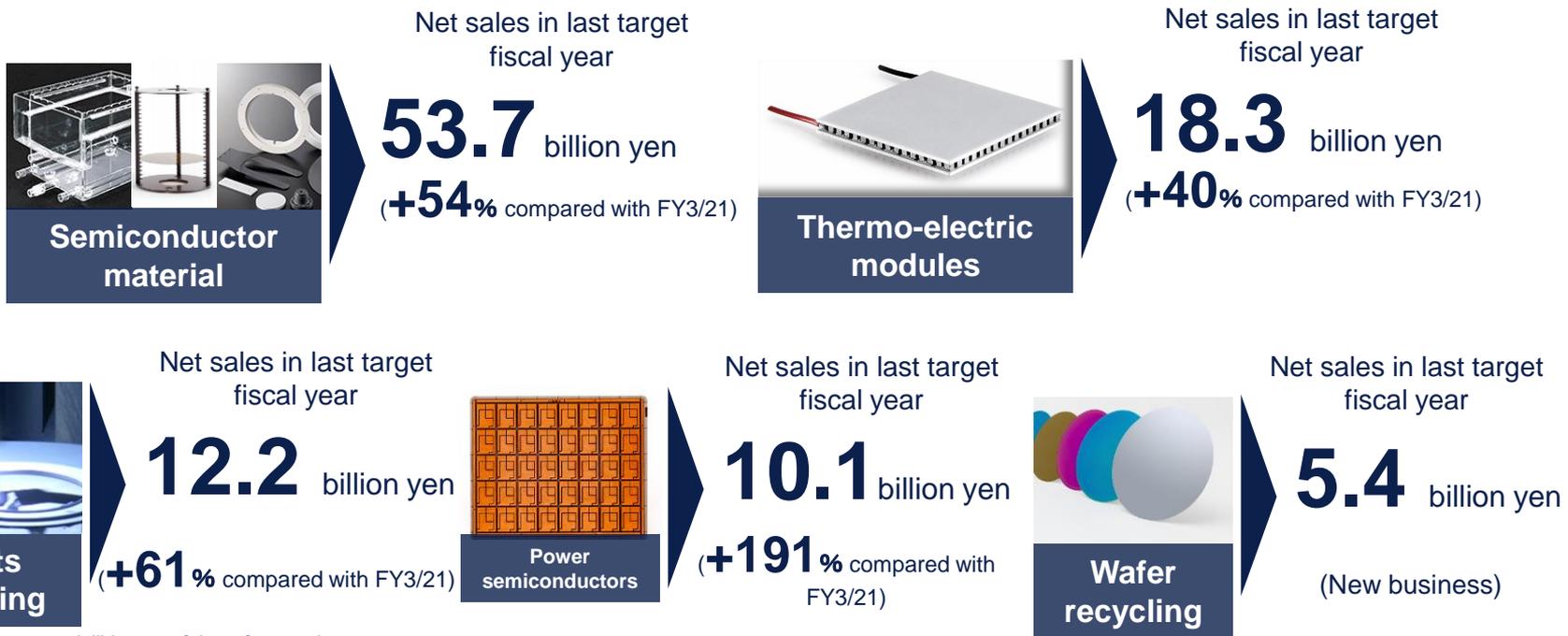
(Net income margin: **10.0%**)



\*Refers to net income attributable to owners of parent.

# To put healthy businesses on a growth track

We will concentrate on the following businesses, which will become the drivers of mid/long-term growth.



\*\*\*"Semiconductor material" is sum of these four products: quartz, silicon parts, ceramics and CVD-SiC for jigs and consumables for semiconductor manufacturing equipment.

# Map of production bases of Ferrotec Group in China

Distribution of our factories in China



We will contribute to the growth of the market assuming domestic production and expand business by establishing production bases in the vicinity of major footholds of Chinese semiconductor enterprises and improving customer satisfaction.

- |  |                                       |                                                                                                                                               |                                |
|--|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
|  | <b>Semiconductor wafers</b>           |                                                                                                                                               | <b>Thermo-electric modules</b> |
|  | <b>Quarts</b>                         |                                                                                                                                               | <b>Vacuum feedthroughs</b>     |
|  | <b>Ceramics</b>                       |                                                                                                                                               | <b>Wafer recycling</b>         |
|  | <b>Parts cleaning</b>                 | <p>Letters in red show major footholds of Chinese semiconductor enterprises.</p> <p>(1) Beijing (2) Shanghai (3) Wuhan (4) Hefei (5) Xian</p> |                                |
|  | <b>Power semiconductor substrates</b> |                                                                                                                                               |                                |
|  | <b>Silicon parts</b>                  |                                                                                                                                               |                                |

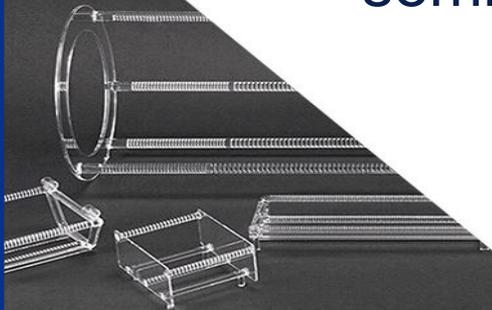
\*We plan to start manufacturing SiC (silicon carbide) wafers in Tongling, Anhui Province from 2021.



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## Goals for major businesses concerning semiconductor equipment-related business



# Our lineup of semiconductor-related products

Jigs and consumables for semiconductor manufacturing equipment (our mainstay material products)



Quartz



Silicon parts



Ceramics



CVD-SiC

**Our strengths: Not only capital investment-linked products (vacuum feedthroughs), but also a lineup of repeat consumables (materials) and services (cleaning and wafer recycling) linked to the production and operation of semiconductor device manufacturers**



**Vacuum feedthroughs**

\*Semiconductor and FPD production equipment parts (Market share: 65% (largest))



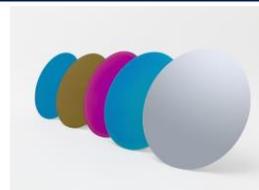
**Metal precision machining**

\*Growth forecast due to increase in future customers (factories) in China



**Machinery parts cleaning**

\*Focus on the Chinese market (Market share in China: 60% (largest))



**Wafer recycling**

\*Focus on the Chinese market (New business to be launched in FY3/22)

## Businesses at equity-method affiliates



**Silicon wafers**

\*Monthly production capacity- 6-inch: 420 thousand, 8-inch: 450 thousand, 12-inch: 30 thousand (increased from 100 thousand to 200 thousand)



**SiC wafers**

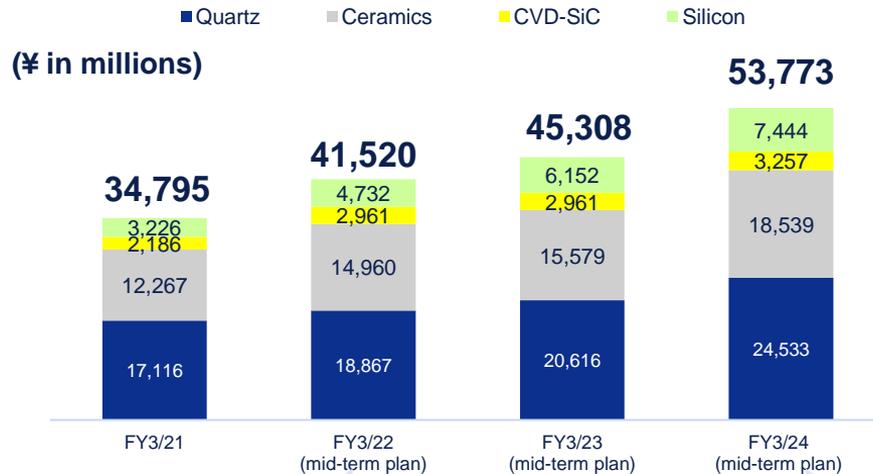
\*Development and mass-production (New business to be launched in FY3/22)

\*The strategic products are quartz, ceramics, CVD-SiC, and silicon.



We aim to increase sales by 54.5% in 3 years (by FY3/24).

## Variations in sales from FY3/21 to FY3/24



Mid-term management plan

- Sales increased significantly in FY3/21, up 26.7% year-on-year.
- The semiconductor market is expected to be healthy thanks to the increasing demand for 5G, telecommuting and data centers.
- As for semiconductor materials, the **demand for consumable materials** is strong, so the ratio of linkage to the **production operation rate** of semiconductor manufacturers is high (some are **investment-linked ones**).
- The wafer fab equipment (WFE) market is estimated to grow year by year in 2021 and 2022, so we will respond to an increase in demand by **strengthening production capacity for materials as needed**.

## We aim to increase sales by 40.3% in 3 years (by FY3/24).

- Among materials, the sales of quartz are projected to grow steadily (as the demand for consumable materials is firm). \*The semiconductor manufacturing equipment market is estimated to grow year by year in 2021 and 2022.
- We have established a system for increasing production output with factories in Hangzhou and Changshan, Zhejiang and Dongtai, Jiangsu, China, and Yamagata City, Japan.



## We aim to increase sales of ceramics and CVD-SiC by 51.1% and 49.0%, respectively, in 3 years (by FY3/24).

- As for ceramics and CVD-SiC, we have the advantage in developing “materials and technologies for processing and coating” in Japan. We will improve machinable ceramics for laser-processed probe card (high added value).
- Hangzhou Factory in Zhejiang, China is enhancing the capacity to produce fine ceramics, which are in high demand.

### Hyogo: Development and mass-production of fine ceramics



- ・アルミナ
- ・窒化珪素
- ・炭化珪素
- ・窒化アルミ
- ・ジルコニア
- ・低熱膨張



- ・マイカ系マシナブル
- ・窒化物系マシナブル
- ・加工技術紹介



- ・炭化珪素

### Hangzhou in China: Mass-production of fine ceramics



### Ishikawa: Mass-production of machinable ceramics



### Ishikawa: Development of fine and machinable ceramics



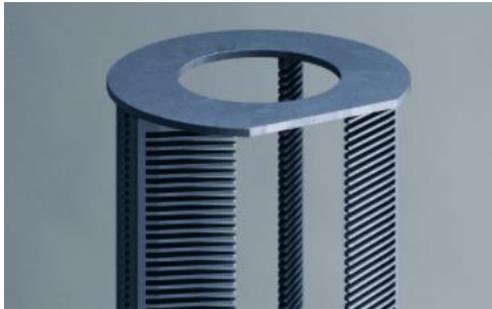
### Okayama: Development and mass-production of CVD-SiC



**We aim to increase sales of silicon parts by 130.8% in 3 years (by FY3/24).**

- Up to now, ingots for silicon parts have been produced in Yinchuan, while processing and assembly have been conducted in Hangzhou.
- In order to meet the request for the significant increase of production output from clients, we plan to boost the output of ingots, add processing and assembly lines, and establish a large-scale integrated manufacturing system in Yinchuan.

Boat



Injector



Focus ring

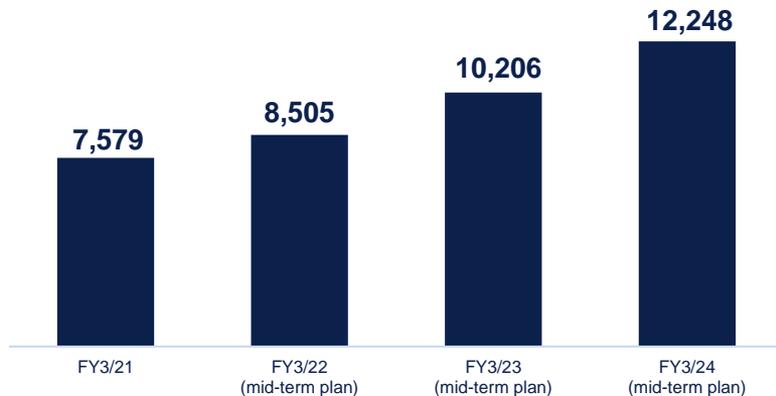




We aim to increase sales by 61.6% in 3 years (by FY3/24).

## Variations in sales from FY3/21 to FY3/24

(¥ in millions)



- Sales increased significantly in FY3/21, up 35.2% year-on-year.
- **This business is targeted at the Chinese market.** Its scale has been growing steadily year by year, in response to the expansion of production by **semiconductor and FPD (organic EL and liquid crystal) manufacturers.**
- Since this business is **a recurring-revenue type that depends on clients' production operation**, like semiconductor materials, we can readily secure stable sales (**the business is expected to keep growing steadily**).
- Since we are increasing the cleaning volume with 5 bases and 7 factories, **our market share in China is approaching 60%.**

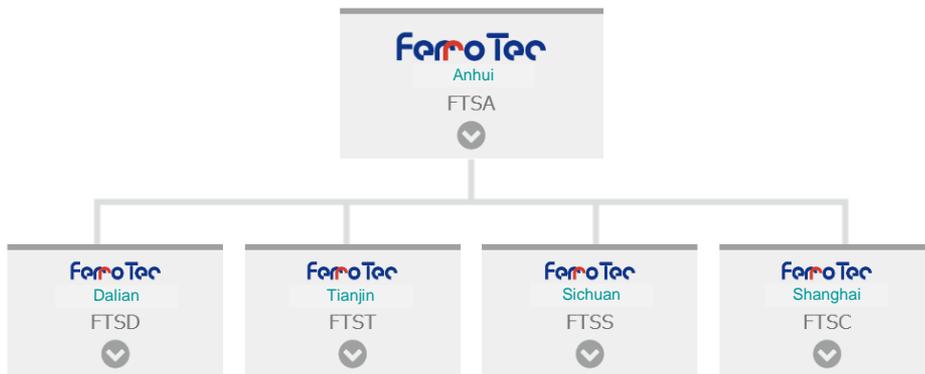


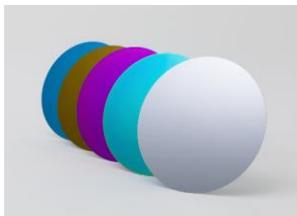
- The governmental fund of Tongling, Anhui will co-invest, and we aim to realize a project for expanding the business.
- We plan to increase the cleaning volume in Tongling for Chinese semiconductor and FPD manufacturers.

★For the equipment parts cleaning, we restructured our organization with the factory in Tongling, Anhui controlling the other factories.

**Preparations started to list the subsidiaries in Tongling, Anhui in the Chinese market.**

★To offer meticulous services in the vicinity of client facilities  
(5 bases and 7 factories → 6 bases and 9 factories in 2021)

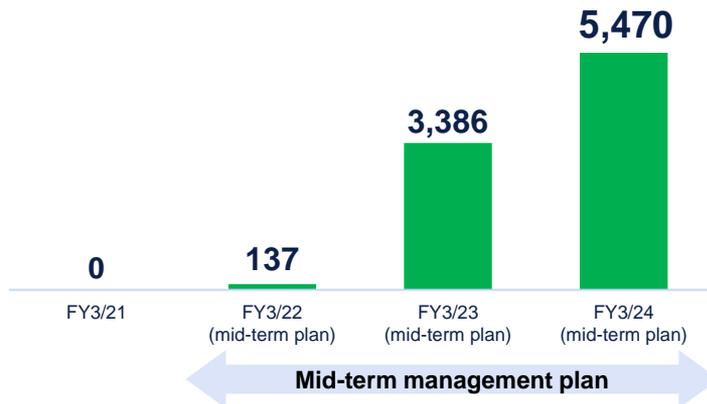




Wafer recycling factory built in Tongling, Anhui

## Variations in sales from FY3/21 to FY3/24

(¥ in millions)



Target net sales in the final fiscal year  
(FY3/24)  
5.4 billion yen

- To be launched in FY3/22
- To use the resources of the wafer business and the know-how of the cleaning business. Technical tie-up with partners for the film removal process. Future schedule (tentative): Construction was completed in November 2020, **start trial operation in 2Q (April-June) of 2021 and proceed to mass production in 4Q (October-December) of 2021**
- **Due to the acceleration of domestic production of semiconductors in China**, the demand for wafer recycling rose sharply. We increased monthly cleaning capacity from 65,000 to **120,000 wafers** in Phase 1 (investment: 7.85 billion yen to **14.02 billion yen**) to meet strong customer demand for mainly 12-inch wafers. \*Up to 200,000 wafers are planned.
- Capital increase through third-party allotment: Implemented a capital increase amounting to 1.14 billion yen (710 million yuan) combined with the first third-party allotment in December of the fiscal year ended March 2021. The capital of a subsidiary Ferrotec (Anhui) Changjiang Semiconductor Material Co., Ltd., which engages in wafer recycling, rose to 18.99 billion yen (1.21 billion yuan) after capital increase. <The shareholding ratio of the Group will decrease from 70.0% to 41.3%. \*The investment ratio of multiple government funds has risen.>



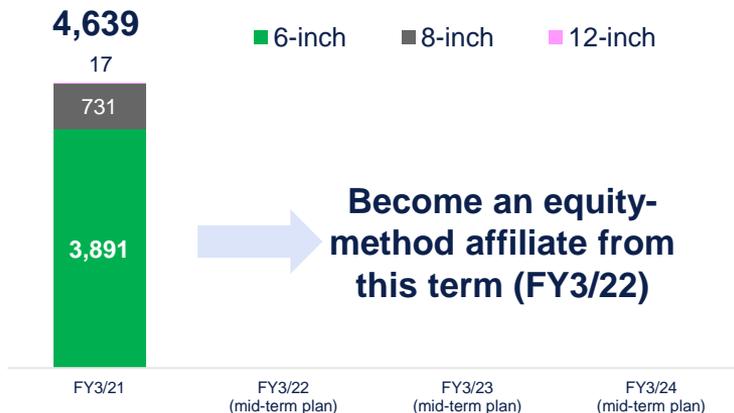
Wafer processing factory in Hangzhou, Zhejiang

## To manufacture 200,000 12-inch wafers per month

- Through the transfer of shares of the subsidiary producing semiconductor wafers (CCMC [former name: FTHW]) and the capital increase through third-party allotment conducted twice, the shareholding ratio of our corporate group decreased to 23% in FY3/22. <The subsidiary became an equity-method affiliate in 4Q of FY3/21.>
- As for **6-inch wafers**, demand is currently strong. **A system to produce 420,000 wafers per month was maintained** in FY2021.
- **We are strengthening the direct sales system of 8-inch wafers.** In Shanghai and Hangzhou, we will develop a system for producing 350,000 wafers per month by the end of FY2021. \*The capacity is 450,000 wafers per month.
- **As for 12-inch wafers**, we plan to increase the output from 30,000 wafers per month to 100,000 wafers per month to 200,000 wafers per month (by the end of FY2022. The funds for capital investment will be procured through the capital increase through third-party allotment in China.)
- We aim to develop a system for producing 70,000 wafers per month by the end of FY2021.

(¥ in millions)

### Variations in sales



Become an equity-method affiliate from this term (FY3/22)

# Map of production bases for semiconductor wafers in China

- We are increasing clients who have approved the 8-inch and 12-inch wafers manufactured at the factory in Hangzhou, and increasing production output.

**Yinchuan ingot factory**  
6, 8, and 12-inch wafers

**Silicon wafer**

**Shanghai wafer factory**  
6 and 8-inch wafers

**Hangzhou wafer factory**  
8 and 12-inch wafers

**Ingots**

Ferrotec (Ningxia) Semiconductor Technology Co., Ltd. Factory 1  
Ferrotec (Ningxia) Semiconductor Technology Co., Ltd. Factory 2

Shanghai Shenhe Thermo-Magnetics Electronics Co., Ltd.  
Hangzhou Semiconductor Wafer Co., Ltd.

Launched the SiC (Silicon Carbide) business as a joint venture with the Chinese Academy of Sciences and government and private funds

## SiC (silicon carbide) wafers (non-consolidated)



◆ We established a joint venture with the Shanghai Institute of Ceramics, Chinese Academy of Sciences (SICCAS) and government and private funds in Tongling City, Anhui Province in October 2020 (Group's investment ratio: 31.5%). We will develop and manufacture SiC (silicon carbide) single crystal ingots and wafers, whose market is expected to grow as they will be used for the most advanced semiconductors (③ third generation semiconductors) in China.

\*We plan to complete construction, deliver equipment, and start trial production by the end of 2021.

### ■ Technical issues of SiC (silicon carbide) single crystal

-High technical difficulty in crystal growth (larger diameter), substrate production, electrical characteristic control, and crystal defect control. Hence, some companies in Europe, the United States, and Japan have achieved mass production. In China, it is a strategic technology in order to achieve domestic production amid increasing domestic demand for electric vehicles.



### ■ Backgrounds for working on the business as a joint venture

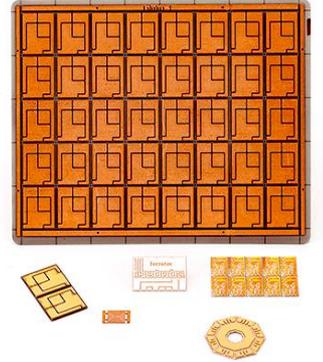
- (1) Our group: Defect control technology and equipment manufacturing technology cultivated in the semiconductor Si single crystal business. Possession of knowledge and the customer base for SiC through the CVD-SiC (jig for semiconductor manufacturing equipment) business.
- (2) SICCAS: China's top SiC research institute. Possession of intellectual property and human resources
- (3) Financing: Government and private funds and government subsidy support



\*The graph is produced by our company with reference to the material of Fuji Keizai.

# Ferrotec

Ferrotec Holdings Corporation



## Goals for major businesses concerning electronic device business



## Thermo-electric modules



\*As temperature adjustment devices, thermo-electric modules are increasingly used in the fields of automobiles, semiconductor manufacturing equipment, communications, medical biotechnology, consumer products, etc.  
**(Market share: 36% (largest))**



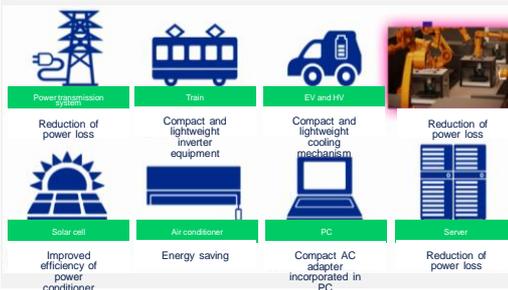
**DNA amplification (bio)**  
 To check the existence of pathogens that cannot be observed with a microscope <PCR method>  
**\*Polymerase Chain Reaction**

## Power semiconductor substrates



\*In response to **the global trend of power consumption reduction**, the demand from clients needing power semiconductors is growing.  
 (DIRECT COPPER BONDING technology for bonding a copper circuit to an aluminum ceramics substrate)

### Application of power semiconductors



## Ferrofluid



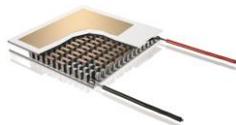
\*Used in a wider range of fields, including automobile speakers, high quality sound TV speakers, and smartphone vibration  
**(Market share: 80% (largest))**



Adopted for **high-quality sound headphones**

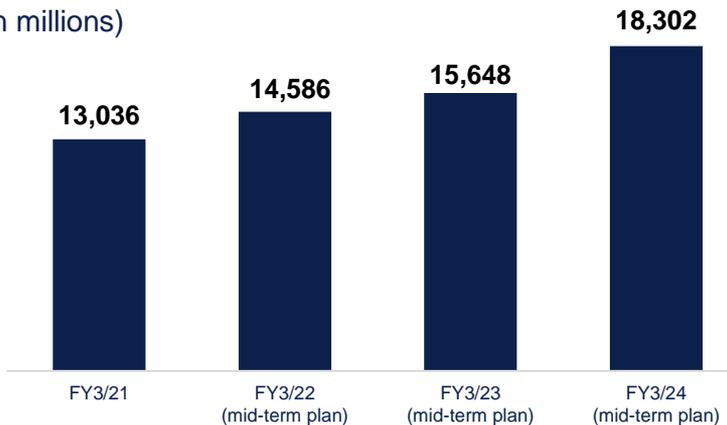
\*To stabilize vibration, to actualize deep bass and realistic sensation

**\*We aim to increase sales by 40.4% in 3 years (by FY3/24)**



## Variations in sales from FY3/21 to FY3/24

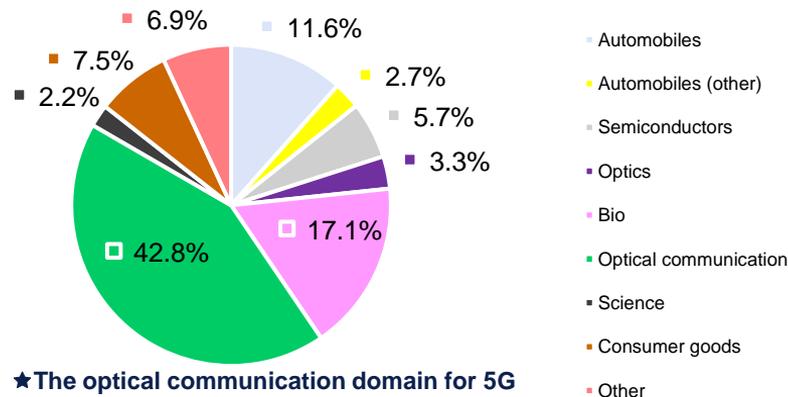
(¥ in millions)



← Mid-term management plan →

- Sales increased significantly in FY3/21, up 32.2 % year-on-year.
- **Applications for 5G communication devices are expanding.**  
(Estimated number of 5G communication bases in China: 640,000 in 2020, 770,000 in 2021 and 730,000 in 2022)
- The range of purposes of use of thermo-electric modules and the demand for them are increasing, through the expansion of use in the bio field, including PCR tests, and the digitization of consumer products (wearable devices), IoT, home appliances, etc.

## Ratios of purposes of use of thermo-electric modules in FY3/21



★The optical communication domain for 5G communication devices is expanding.

For thermo-electric modules, we aim to expand the business domain and the range of purposes of use

As mentioned previously,

- ◆ We acquired RMT Ltd. as a subsidiary, to incorporate the high value-added module technology for telecommunications, etc.
- ◆ Based on the alliance with cado Co., Ltd., we will plan to release consumer products utilizing the temperature control technology.

Thermo-electric modules are being adopted for controlling the temperatures of underwear and jackets.  
\*The demand for thermo-electric modules for wearable products is expected to grow remarkably.

**Thermo-electric module production bases of the Group. \*RMT Ltd. will be added.**

In 2020, we acquired RMT Ltd. in Russia as a subsidiary in Europe.  
\*RMT excels at producing micro multistage modules.



Jacket that can get cooler and warmer (prototype)

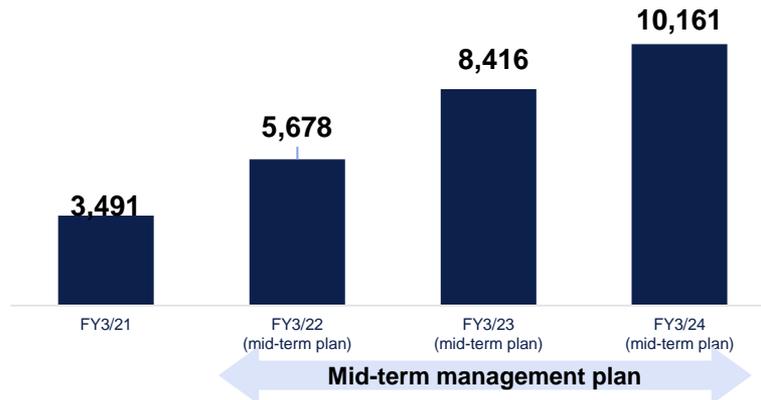
**\*We aim to increase sales by 191.1% in 3 years (by FY3/24)**



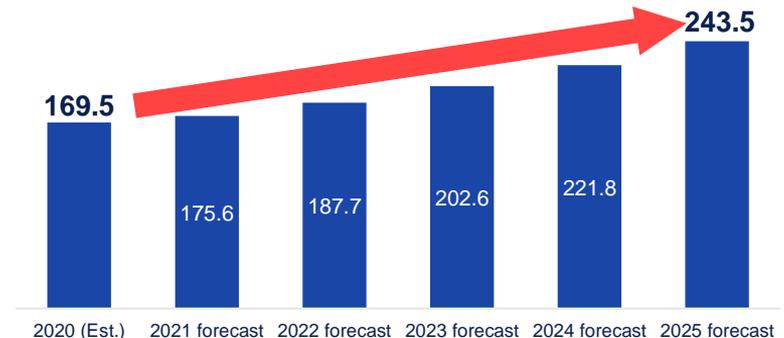
- In FY3/21, annual sales grew 23.0% from the previous year, despite the drop in demand for products for industrial equipment and in-vehicle devices in the first half due to COVID-19.
- As there is a global trend of power consumption reduction, **our business is growing steadily**. (The scale of the power semiconductor market is estimated to be 4.2 trillion yen in 2030.)
- **An increasing number of global makers including Chinese ones are adopting our products.**

## Variations in sales from FY3/21 to FY3/24

(¥ in millions)



## Market trend estimate of power semiconductor substrates



\*The graph is produced by our company with reference to the material of Yano Research Institute.

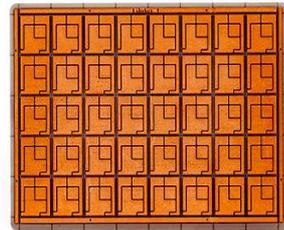
# Power semiconductor substrates: To release AMB substrates to expand our business scale

- We are currently increasing the production output of DCB substrates for home appliances and industrial equipment and AMB substrates for automobiles, etc.
- The power semiconductor substrate factory in Dongtai, Jiangsu is expanding its production capacity, and sales are estimated to keep growing in the next and following terms.  
(Production capacity in 2021: From 600,000 DCB substrates to 1 million DCB substrates and from 100,000 AMB substrates to 200,000 AMB substrates at Shanghai and Dongtai factories)
- Furthermore, we will release DPC substrates with high heat resistance and high strength, and enhance the measures for selling products for optical communication, power LED products, etc.

\*We plan to make the subsidiary in Dongtai, Jiangsu listed in the Chinese market.

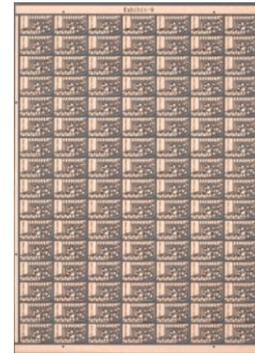
**★As the demand for in-vehicle devices grew, the demand for AMB substrates increased.**

**DPC substrates will be launched in FY2021**



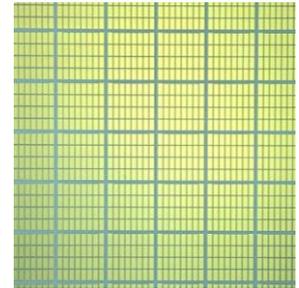
**DCB substrates  
(Direct Copper Bonding)**

Material: Alumina ceramics



**AMB substrates  
(Active Metal Brazing)**

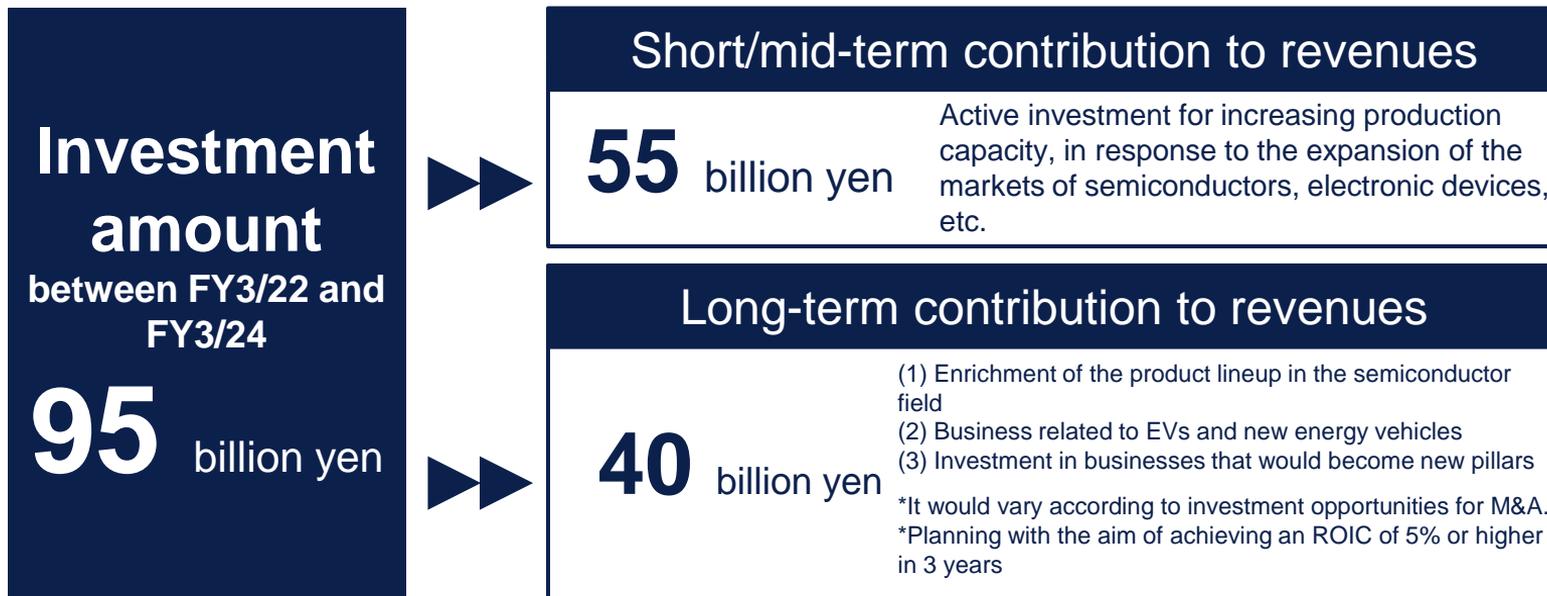
Material: Silicon nitride



**DPC substrates  
(Direct Plated Copper)**

Material: Alumina ceramics, etc.  
+  
metalization (Ni, etc.)

- We plan to invest a total of 95 billion yen in 3 years.
- In response to the growth of the markets of semiconductors, electronic devices, etc., we will invest for boosting production output, and discuss strategic investment for long-term growth actively.



- We plan to invest 95 billion yen, while operating cash flow (net income + depreciation) is estimated to be 65 billion yen.
- We will keep improving the financial standing, and try to secure an appropriate balance among business opportunities, investment for growth, and the financial standing.

## Investment amount

between FY3/22 and FY3/24

**95** billion yen

Short/medium term:  
55 billion yen

Long term:  
40 billion yen

- Total operating cash flow: 65 billion yen
  - ✓ To use net income as a KPI, and accumulate it by increasing profit
  - ✓ To manage the investment level and improve return on investment and ROIC control
- To discuss the use of Chinese capital for strategic long-term investment and new businesses (including the recycled wafer business) in the Chinese market
- We aim to conduct IPO and capital increase through the issuance of new shares for the businesses for cleaning, power semiconductor substrates, silicon parts, and quartz crucibles.

# Fund procurement by Chinese subsidiaries

- Chinese subsidiaries will procure funds amounting to 18.6 billion yen\* between January and June 2021 (the consolidated fiscal year ending March 2022).
- We aim to procure funds through IPO and the capital increase through the issuance of new shares for the businesses regarding cleaning, power semiconductor substrates, silicon parts, and crucibles by utilizing Chinese capital for new businesses, including recycled wafers.

\*Including the balance of cash and deposits as of the end of FY3/21 for the capital increase in the previous term

\*Our company's equity is based on the results of FY3/21 (as of the end of December 2020 for overseas subsidiaries).

Contents of business	Target subsidiary		Disclosure date	Release title	Our shareholding ratio
Quartz crucibles, silicon parts	Ferrotec (Ningxia) Advanced Quartz Material Co., Ltd.	Yinchuan	Feb. 10, 2021	Notice of Issuance of New Shares through Third-Party Allotment by Subsidiary that Manufactures Components for Semiconductor Manufacturing (Quartz Crucibles and Silicon Parts), and Change to a Specific Subsidiary	90.0%
Power semiconductor substrates	Ferrotec (Jiangsu) Semiconductor Technology Co., Ltd.	Dongtai	Nov. 17, 2020	Notice of the Issuance of New Shares through Third-Party Allotment by the Subsidiary that Manufactures Power Semiconductor Substrate	88.8%
Precision parts recycling/cleaning	Ferrotec (Anhui) Technology Co., Ltd.	Tongling	Aug. 14, 2020	Notice of Preparations to List a Chinese Subsidiary on the Science and Technology Innovation Board (STAR Market)	67.7%
Recycled wafers	Ferrotec (Anhui) Changjiang Semiconductor Material Co., Ltd.	Tongling	Oct. 16, 2020	Notice of the Issuance of New Shares through Third-Party Allotment by the Subsidiary that Operates the Semiconductor Silicon Wafer Recycling Business (*1)	41.3% (*2)



(Results of overseas subsidiaries as of June 2021)

Procured capital	End of Sep. 2021
7.2 billion yen	68.6%
4 billion yen	74.0%
-	67.7%
7.4 billion yen (*3)	41.3%

\*1: The revised version was released on February 10, 2021.

\*2: Shareholding ratio including the in-kind contribution with our intellectual property amounting to 300 million yuan

\*3: Including the balance of cash and deposits as of the end of FY 3/21

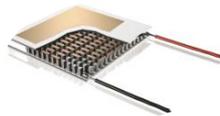
\*4: Our company's equity for semiconductor silicon wafers is 29.5% in FY3/21, and 23.5% in the plan as of the end of September 2021.

**As mentioned previously, we will exert the mid-term synergy with Ohizumi Mfg. Co., Ltd., with which we formed capital and business alliances, in the automobile field.**



- By utilizing the strengths of our products, including the heat dissipating/cooling property of thermo-electric modules and the sealing property of ferrofluid, we will expand the business of in-vehicle devices, in which the demand for semiconductors will increase.
- Our products are used for various purposes, including the temperature control of CMOS sensors and lithium ion batteries, and cup holders.
- To discuss the fusion of Ohizumi's sensor technology and our temperature control technology (thermo-electric module), the cultivation of automobile markets in Japan and China, etc.

**Our products that can be used for in-vehicle devices**



**Thermo-electric module**



**Ferrofluid**



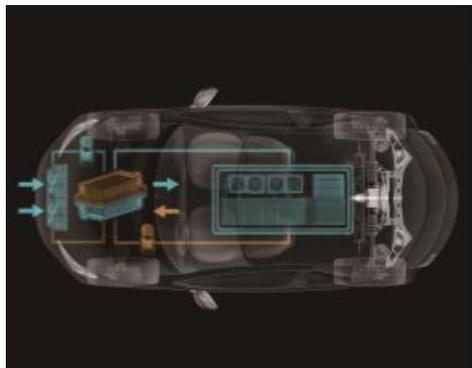
**Power semiconductor substrate**

# Application of thermo-electric modules to in-vehicle devices (Examples of products for EV and ADAS)



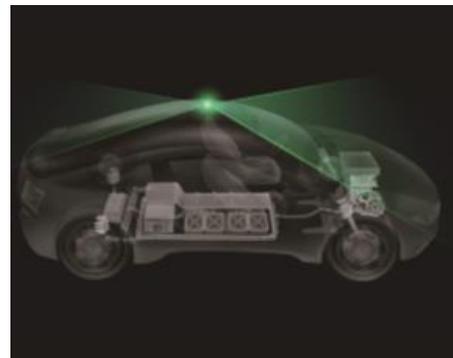
Thermo Electric CMOS Cooler for ADAS

CMOS image sensors are used for cameras in ADAS. Dark current noise is produced in a CMOS image sensor if temperature rises. By using thermo-electric modules, it is possible to control the temperature of CMOS image sensors with their compact, lightweight and convenient properties and reduce the dark current noise.



Thermo Electric Battery Heater Cooler

Batteries used for EVs, HEVs, PHEVs, etc. are very sensitive to temperature. High temperatures affect the lifespan of each battery, while low temperatures affect the performance of each battery. By using thermo-electric modules, it is possible to control the temperature of the batteries with their compact, lightweight, convenient and efficient properties.



LiDAR

By irradiating an object with a laser while scanning and observing the reflected laser, it measures the distance from that object and identifies the properties of that object. Heat makes it difficult to conduct accurate measurement with a laser. By using thermo-electric modules, it is possible to control the laser source and stabilize measurement precision.

- In order to improve our business performance and achieve sustainable growth, we will focus on the “quality improvement” and “strengthening of personnel,” and promote them based on leadership of the management.

## Quality improvement

Considering that “quality is vital,” we will enhance quality control.

- We will take action, operate business, and foster culture while giving top priority to quality.
- We will promote automation and digitization, to strengthen the production system.

## Strengthening of personnel

We will strengthen personnel and reform organizational structures.

- To drastically improve our human resources and organizations, as sales and corporate scale are growing
- To recruit and utilize skilled workers, train existing personnel, and combine them
- To foster and diffuse corporate culture in order to achieve growth

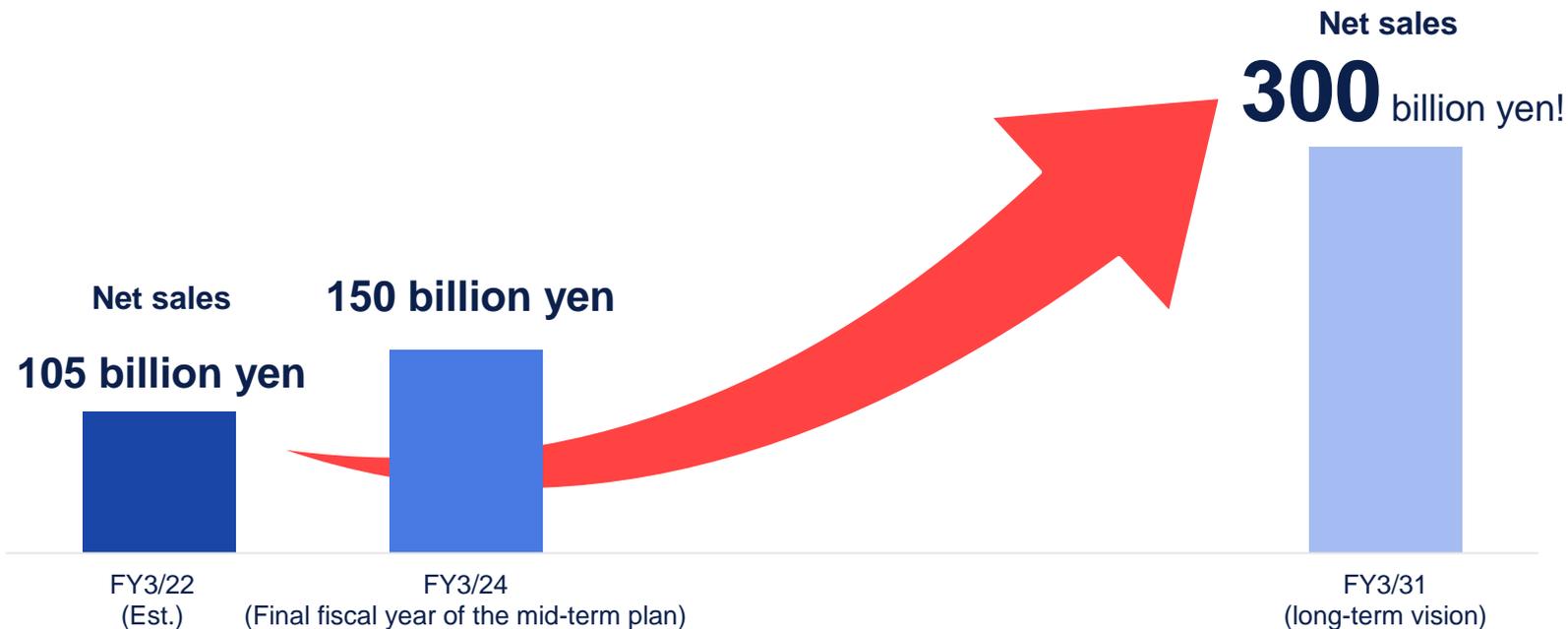
# Mid-term management plan KPI by fiscal year

KPI (¥ in millions)	FY3/20	FY3/21	FY3/22 (mid-term plan)	FY3/23 (mid-term plan)	FY3/24 (mid-term plan)	
Consolidated net sales	89,478	91,312	105,000	125,000	150,000	
Operating income	6,012	9,640	15,000	19,000	25,000	
Operating margin: %	7.4%	10.6%	14.3%	15.2%	16.7%	
Net income	1,784	8,280	7,800	11,000	15,000	
ROE: %	3.6%	14.3%				15%
ROIC: %	1.4%	7.2%				8%
Equity ratio: %	25.5%	37.9%				Over 40%
Capital investments	<b>33,920</b>	<b>14,297</b>	<b>40,000</b>	<b>29,000</b>	<b>26,000</b>	
Annual dividend (yen)	<b>24 yen</b>	<b>30 yen</b> <small>(includes commemorative dividend of 4 yen)</small>	<b>28 yen</b>	Increase return to shareholders through profit growth		

\*ROIC = Net income attributable to owners of parent / (Interest-bearing liabilities + Net assets)  
Net assets do not include share acquisition rights or non-controlling interests' equity.

Beyond a billion-dollar company\*

**By FY2030 (FY3/31), we aim to achieve net sales of 300 billion yen and a net income of 30 billion yen!**



- The forward-looking statements in this document are based on information available as of the date of publication of this document and assumptions concerning uncertain factors affecting future results.
- Actual results may differ materially from these forecasts due to various factors. Such factors include, but are not limited to, international conditions, economic conditions, product supply and demand trends, raw material prices, market conditions, and exchange rates.
- Quantitative targets and capital investments in these materials represent medium-to long-term strategies and visions, and are not performance forecasts. We undertake no obligation to update any information with respect to these matters.
- For official forecasts, please refer to the disclosure of financial results based on the Tokyo Stock Exchange Regulations.

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