

# Progress Briefing on 2022-2024 New Medium Term Business Plan

May 21, 2024  
Mitsui Mining & Smelting Co., Ltd.



We promote the well-being of the world  
through a spirit of exploration  
and diverse technologies.



## Purpose and 2022-2024 Medium Term Business Plan (22-24 MTP)

We commenced 2022-2024 Medium Term Business Plan in conjunction with establishing **Purpose (Our social reason for existence)**, and FY2024 will be the final year of the medium-term plan.

We aim for sustainable growth and enhancement of corporate value in the medium to long term based on “**ambidexterity**” and “**integrated thinking-based management**”

### Purpose



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### ● Ambidexterity

- Exploration  
(Experiment and act on new business)
- Exploitation  
(Business efficiency improvement and ceaseless kaizen efforts)

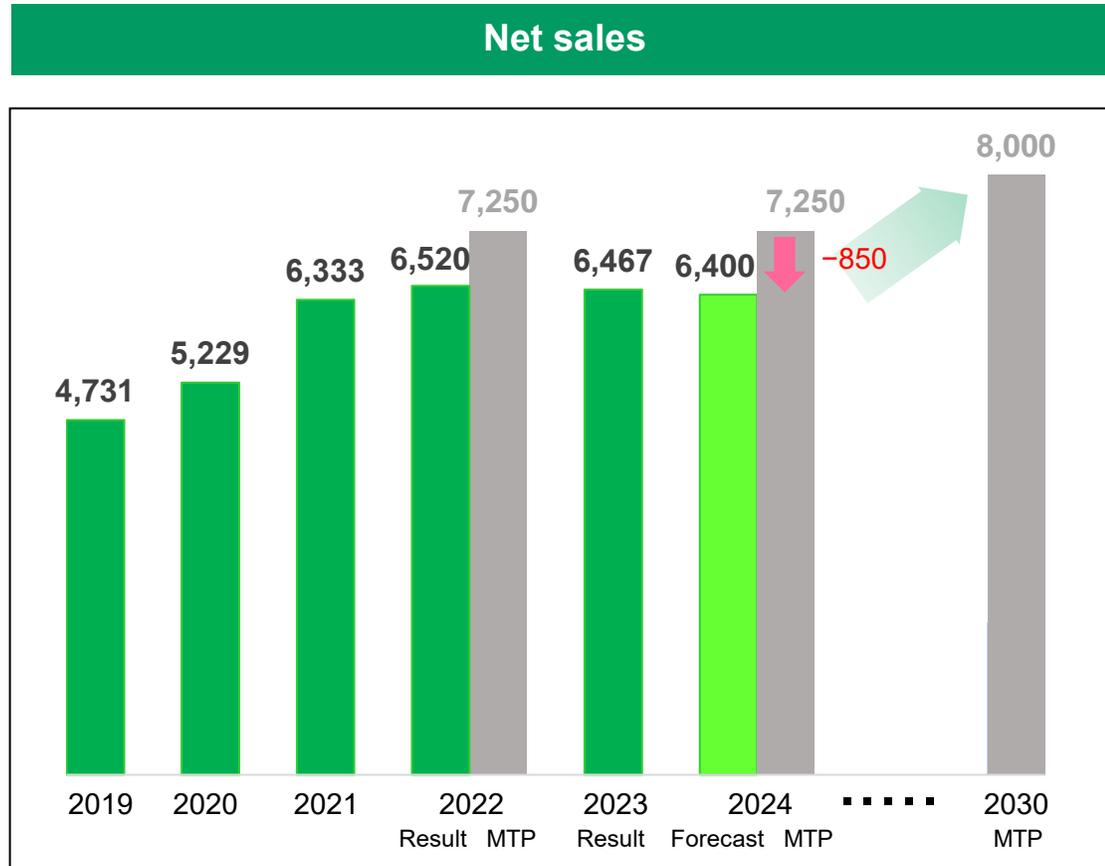
### ● Integrated thinking-based management

- Social value improvement
- Financial value improvement

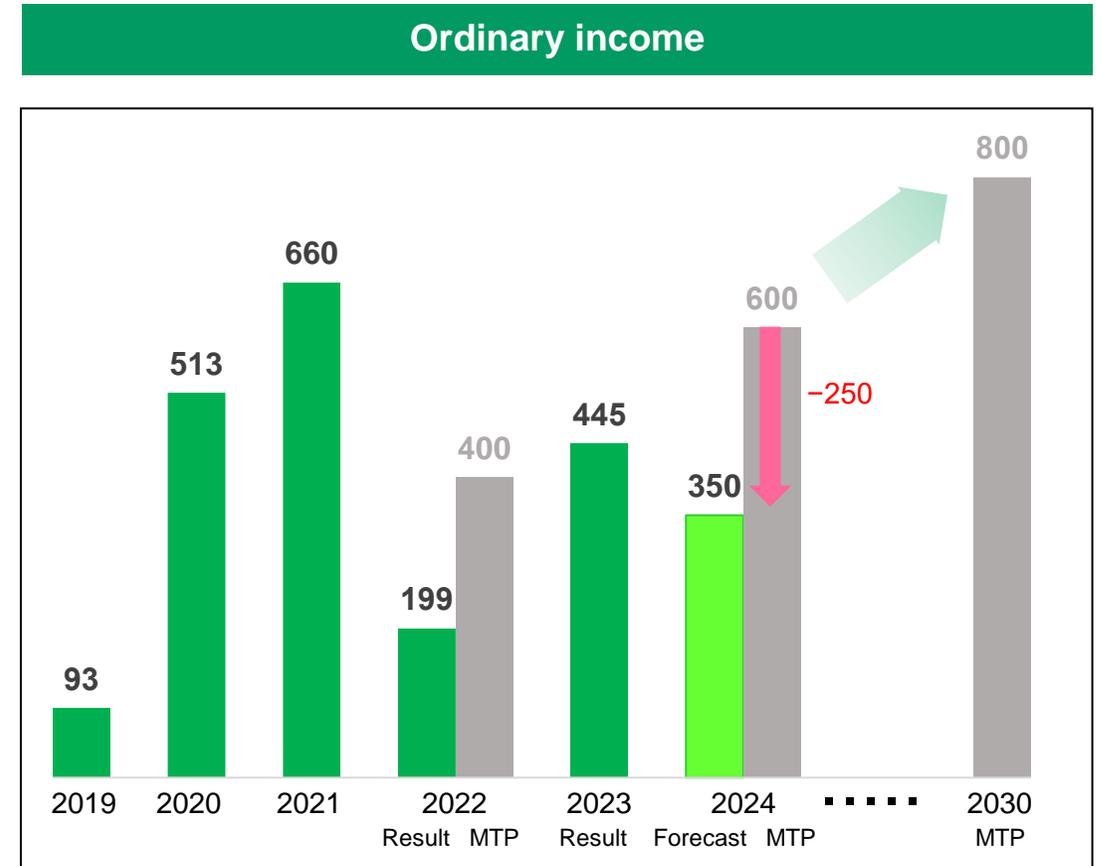
## Financial Figures - Net Sales and Ordinary Income

Financial figures for the final fiscal year of 22-24 MTP (FY2024) are expected to **fall far short** of the target. However, the FY2030 **target remains unchanged**

(Unit: 100 million yen)



(Unit: 100 million yen)



Although the financial figures were far short of the plan, our efforts toward 2030 (**ambidexterity** and **integrated thinking-based management**) are progressing better than 22-24 MTP. We will continuously aim to achieve sustainable growth and increase our corporate value in the medium to long term

# Financial Figures - Ordinary Income and Real Income by Segment

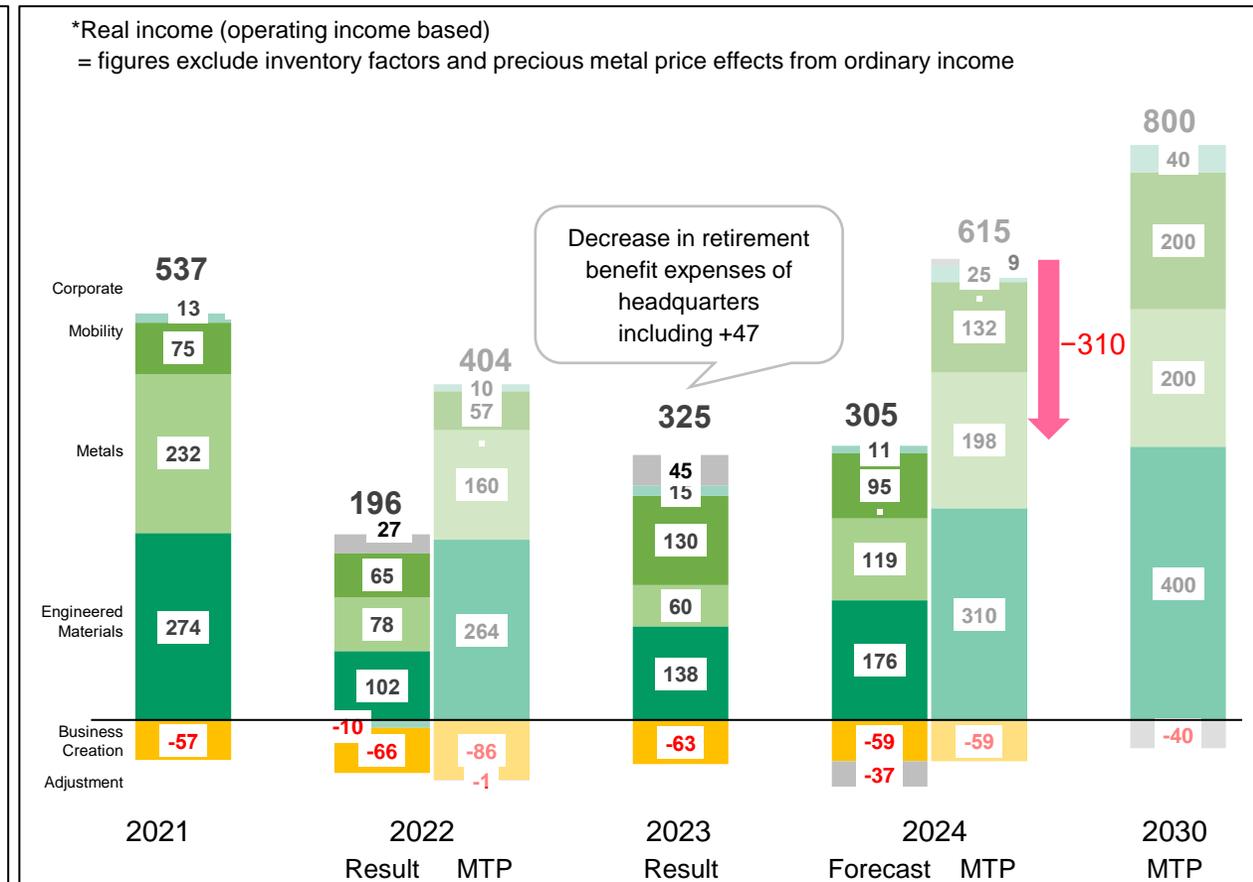
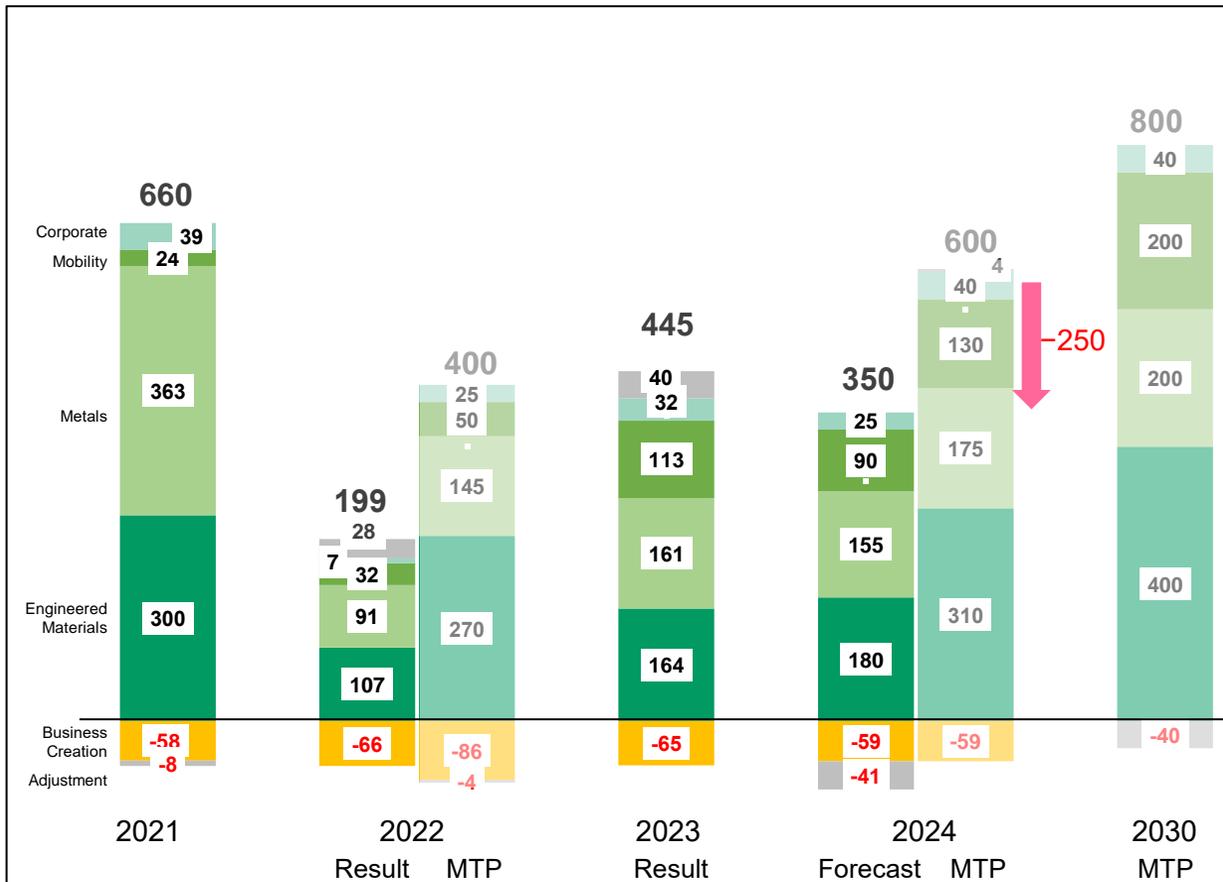
All segments are expected to **fall far short** of 22-24 MTP due to lower sales of major products, higher costs, etc. compared to 22-24 MTP

(Unit: 100 million yen)

(Unit: 100 million yen)

## Ordinary income by segment

## Real income by segment (operating income based)



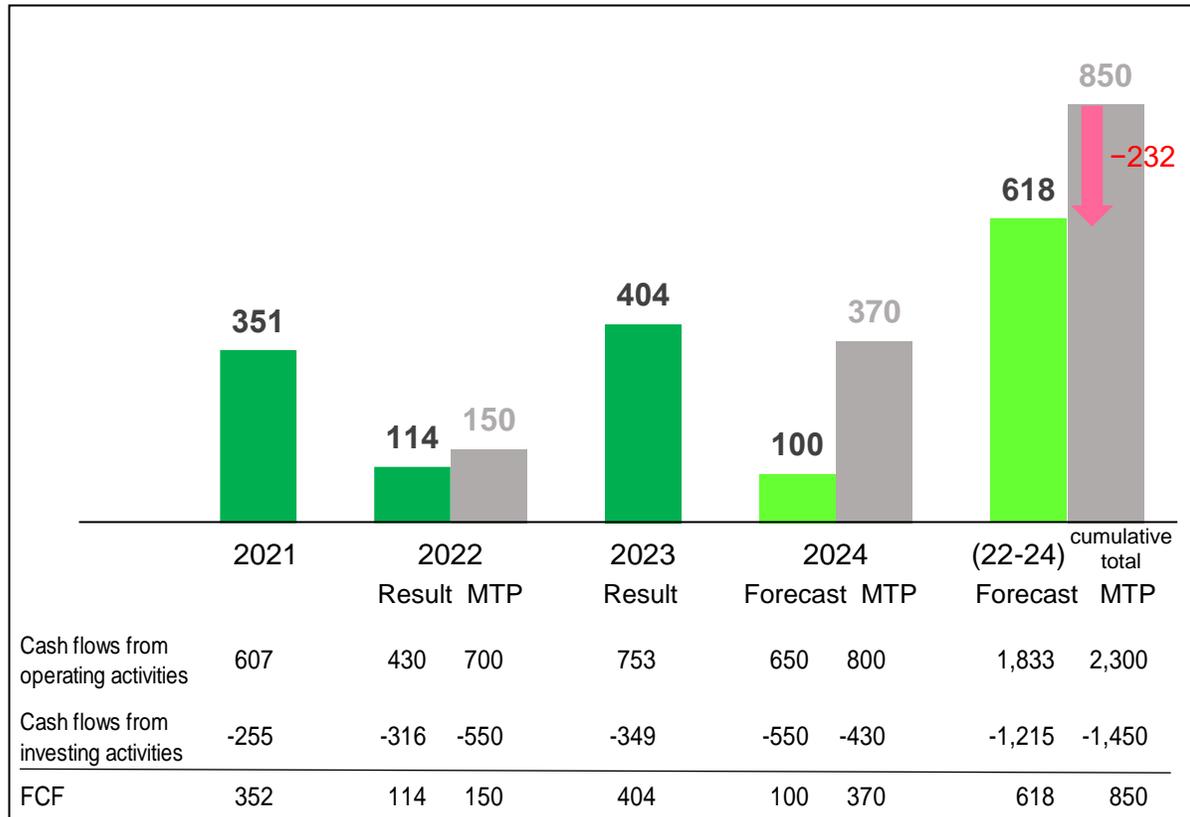


# Financial Figures - Cash Flows, ROE, Equity Ratio

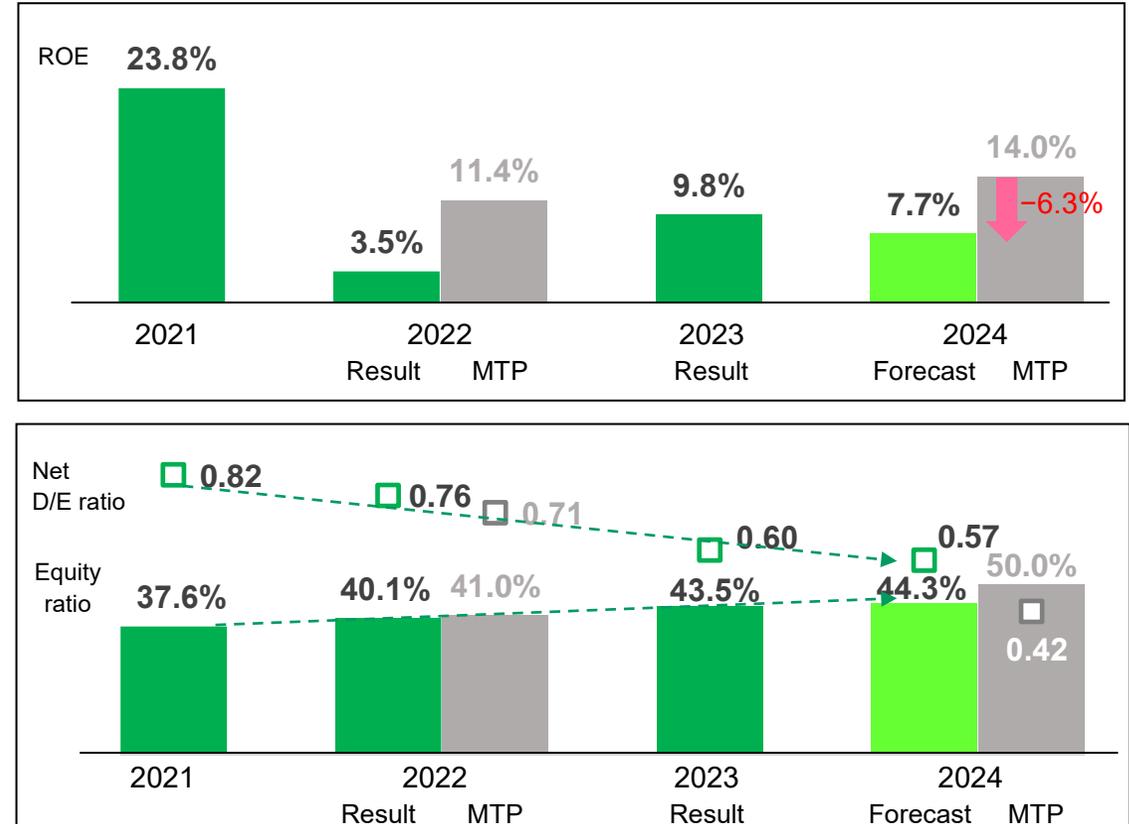
Due to deteriorating business performance compared to 22-24 MTP, various indicators are expected to **fall short** of FY2024 targets, but the financial structure is expected to **improve moderately**

(Unit: 100 million yen)

## Free cash flows (FCF)



## ROE, Equity ratio, Net DE ratio





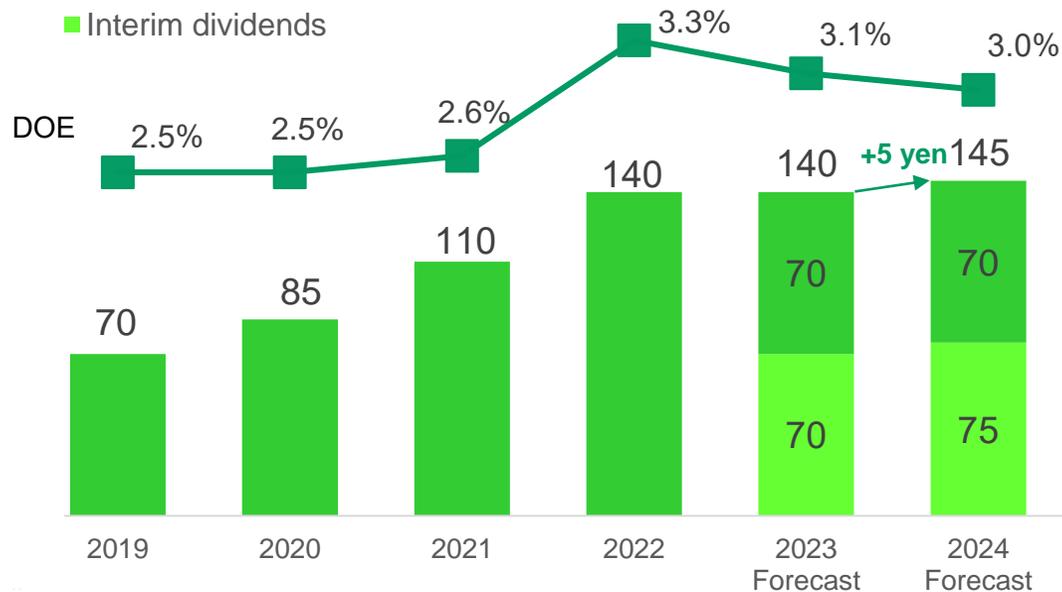
# Shareholder Returns

Based on the dividend policy, we plan to pay a **dividend of 145 yen** in 2024, **an increase of 5 yen** from the previous year. The dividend policy will continue for the foreseeable future.

## Dividend policy for 22-24 MTP onwards

To ensure stable and continuous dividend payments, we aim to pay dividends to shareholders with a dividend on equity ratio (DOE) of **3%**

## Trends in dividend per share and DOE

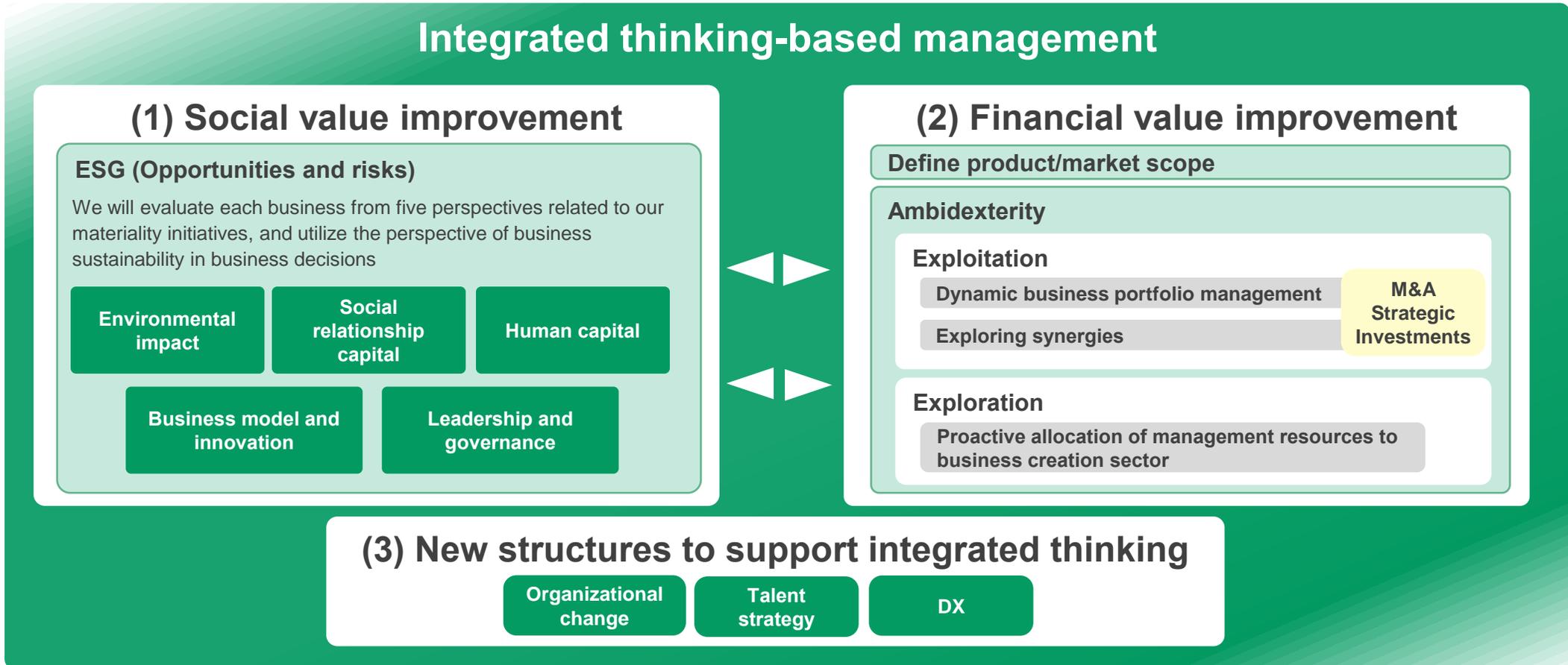


- Since FY2022, when we established our dividend policy, we have paid continuous and stable dividends. Aiming for DOE of **3%**, dividend is expected to increase in the medium term
- With progress in improving our financial structure, we will also revise our dividend policy in the medium to long term.



# Integrated Thinking-based Management

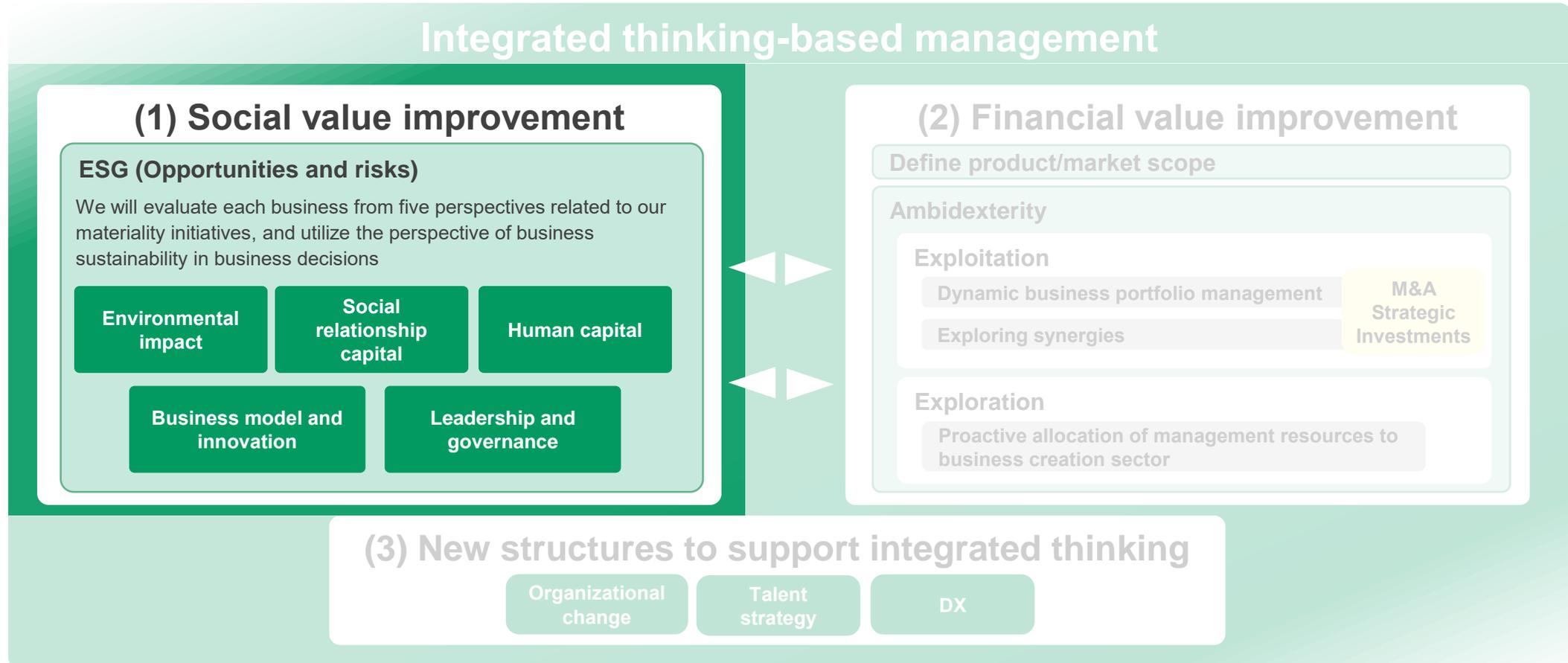
In order to achieve our vision based on Purpose, from April 2022, we conducted full-fledged introduction and promotion of Integrated thinking-based management, which aims to achieve both social and financial value improvement





# Integrated Thinking-based Management

In order to achieve our vision based on Purpose, from April 2022, we conducted full-fledged introduction and promotion of Integrated thinking-based management, which aims to achieve both social and financial value improvement



# Social Value Improvement

Social value improvement

We promote the well-being of the world  
through a spirit of exploration  
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Initiatives are **progressing as planned** for Environment (Initiatives to achieve carbon neutrality), Human capital/Talent strategy, and Governance

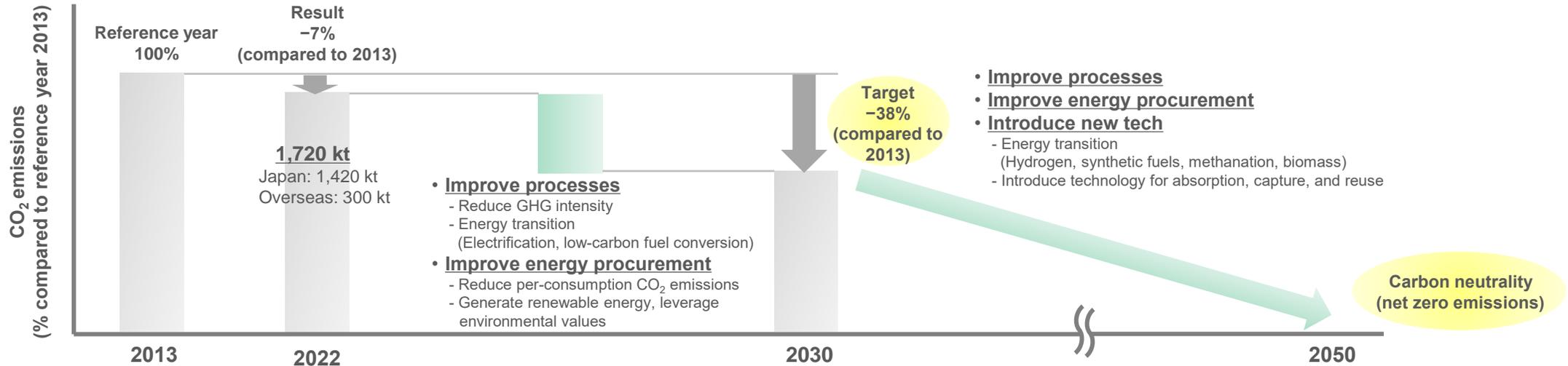
Main items	Main progress	
Environment (Initiatives to achieve carbon neutrality)	<ul style="list-style-type: none"> <li>Formulation of Transition Strategies<sup>*1</sup> for Carbon Neutrality (CN) (News release on January 9, 2024)</li> <li><b>Company-wide TCFD scenario analysis in progress (Scheduled to finish by FY2024)</b></li> </ul>	P10
Human capital/ Talent strategy	<ul style="list-style-type: none"> <li><b>Promote DE&amp;I<sup>*2</sup></b> Ratio of female managers: approximately 4%, male childcare leave ratio: 42%, newly launched Rewarding and Engaging Work Promoting Office</li> <li><b>7.7% salary raise and salary revision for newly graduated employees</b> (News release on February 14, 2024)</li> <li>Obtained “Eruboshi,” certification mark of an excellent company promoting women’s participation and advancement in the workplace (News release on November 8, 2023)</li> <li>Certified as 2024 Health &amp; Productivity Management Outstanding Organization following 2023 (News release on March 11, 2024)</li> </ul>	P11 P12
Governance	<ul style="list-style-type: none"> <li><b>Transition to a Company with an Audit and Supervisory Committee</b> (TSE disclosure on January 22, 2024)</li> <li>Formulation of Stock Ownership Guidelines for Executive Officers and Higher Positions (News release on March 25, 2024)</li> <li><b>Evaluation of the Board's Effectiveness and Response to the Details of Interviews with Institutional Investors and Outside Directors</b></li> </ul>	P14  P13

\*1 Transition Strategy: Four approaches (energy-saving/resource saving, energy and fuel transition, low-carbon electricity and offset/innovation) contribute to CN social implementation

\*2 DE&I: Diversity, Equity and Inclusion

# Medium- to Long-term CO<sub>2</sub> Emission Reduction Targets and Initiatives

- Reduce CO<sub>2</sub> emissions by 38% globally by FY2030 (Scope 1, 2 compared to FY 2013)
- Aim to achieve carbon neutrality (zero net emissions) by FY2050



## Create projects for reducing CO<sub>2</sub> emissions

### Follow Carbon Neutral Roadmap

- ◆ Continuous scrutiny of environmental investments (technology assessment, cost reduction)
- ◆ ICP simulation (target, investment amount)

### Scope 3 Monitor CO<sub>2</sub> emissions

- ◆ Completed identifying CO<sub>2</sub> emissions of domestic locations in FY2023
- ◆ Started studying reduction targets from FY2024

### Use LCA<sup>\*1</sup> to identify improvement points

- ◆ Company-wide LCA introduction (Scheduled to finish by FY2024)
- ◆ Quantify CO<sub>2</sub> emissions by each product and process

### Use TCFD scenario analysis to formulate strategy

- ◆ Company-wide TCFD scenario analysis in progress (Scheduled to finish by FY2024) **P10**
- ◆ Formulate strategies and tactics for reducing CO<sub>2</sub> emissions

## Implement projects for reducing CO<sub>2</sub> emissions

### Use ICP<sup>\*2</sup> for environmental investment promotion scheme

- ◆ Promote environmental investment by applying ICP to evaluate CO<sub>2</sub> reduction effects in terms of investment profitability (FY2023: 19 cases, FY2024: 52 cases)

## Participate in GX League

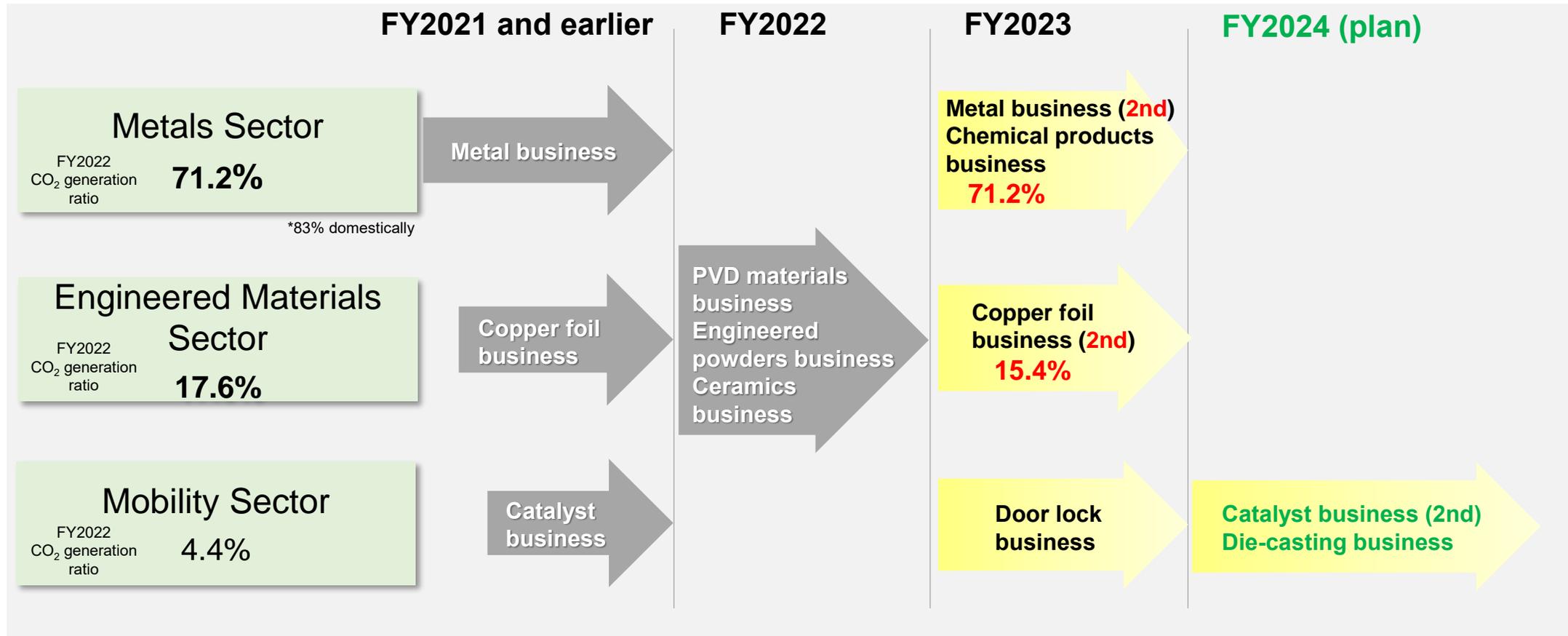
### Comply with new regulations and technologies

- ◆ Establish a system for emissions trading
- ◆ Gather information and materialize new technologies through collaboration with partner companies

# Medium- to Long-term CO<sub>2</sub> Emission Reduction Targets and Initiatives

## Company-wide TCFD scenario analysis introduction

Company-wide TCFD scenario analysis in progress by business from businesses highly likely to be affected by climate change. Conducted review of metal and copper foil businesses with significant impact in FY2023. Plan to conduct further reviews and review of Catalysts Division in FY2024





Social value improvement  
(Human capital)

# Human Capital/Talent Strategy

Personnel are the most important management resource, so we **are steadily implementing** various measures to utilize personnel as an organization while respecting the individuals (blue text below)

Engaged workplace

Innovative workplace

Realize business strategies

**Promote workplace diversity**  
(Diversity, Equity & Inclusion)

**Strategically allocate talents across the entire company**

Initiatives to leverage all types of diversity  
Introduction of KPI on women empowerment into remuneration of directors and officers

Reinforcement of human resources business partner functions  
Full-scale operation of specialized departments

**Career development support**

Achieve professional growth and career vision of each employee

One on one career advice, enhanced training system

**Promotion of rewarding and engaging work**

Provide a positive work environment for diverse talents

Conduct employee awareness survey and execute measures

**Utilize human resources information**

Comprehensive, de-personalized, centralized management

System installation

**Develop human resources strategy**

Identify issues with foresight and resolve them quickly

Dialogue with management and business division managers

[Respect for Individuals] Recognize, enhance, and utilize diversity

[Utilization as an organization] Create a competitive advantage in terms of human resources

Performance-based talent management (Transition to a job-based human resources system in FY2022)

Respect for human rights

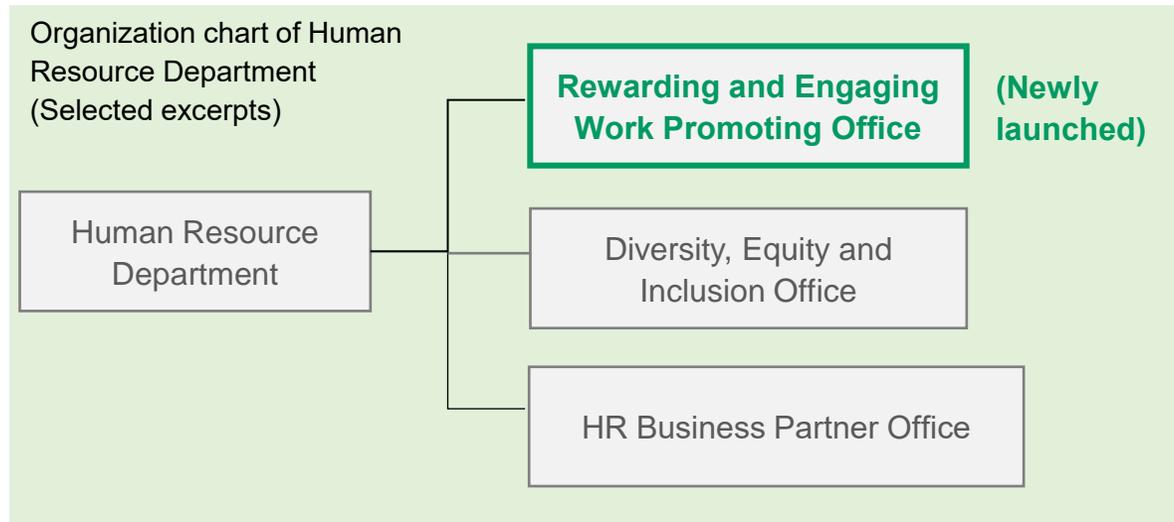
# Initiatives to Enhance Human Capital

Social value improvement  
(Human capital)

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## For bolstering the promotion of rewarding and engaging work



- Launched **Rewarding and Engaging Work Promoting Office** in April 2024
- We will implement company-wide strategies to accelerate the promotion of rewarding and engaging work and measures to continue the promotion
- We will increase employee engagement toward 2030 and build a workplace attracting diverse people to increase our corporate value

## Salary raise and salary revision for newly graduated employees (News release on February 14, 2024)

[Outline]

- For regular employees (excluding managers)
- Salary raise of 20 thousand yen/month (Average rate of salary raise is 7.7%)
- Reached the highest level of salary for new graduates in the industry by increasing salaries according to each category from senior high school graduates to doctorate graduates

- This salary raise is the largest ever seen in the last 30 years and exceeds the union's request. The reaction to this salary raise was strong due to the quick response to the union's request
- We will continuously invest in human capital to improve employee engagement and attract a talented workforce

# Initiatives to Strengthen Governance and Enhance Corporate Value

Social value improvement  
(Governance)

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## Response to the Board's effectiveness evaluation

### [Issues]

- Discussion on allocation of management resources, including investment in human capital and intellectual property
- Discussion on strategy implementation regarding the business portfolio
- Numerous items for discussion at Board of Directors meetings (Delegation of authority from the Board of Directors to Executive Officers should be pursued)

### [Responses]

- **Transition to a company with an Audit and Supervisory Committee**  
Concentrate on discussions to enhance corporate value, such as company-wide strategies, by delegation of authority to executive officers with a monitoring model approach to reduce the number of agenda items at Board of Directors meetings

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## Response to the details of interviews with institutional investors and Outside Directors

### [Requests for disclosure]

- Specific criteria for business portfolio management
- Quantitative disclosure of capital cost and capital efficiency improvements
- Connection of measures related to human capital to corporate value improvement
- Discussions and responses by the Board of Directors regarding the dialogue details with investors
- Connection of intellectual property (IP strategies) to corporate value enhancement

### [Expected measures]

- Acceleration of business portfolio transformation
- Increased accuracy regarding business performance forecasts
- Reduction in capital costs through volatility reduction
- Introduction of capital efficiency indicators in line with shareholder views on performance-linked compensation (ROE, ROIC, etc.)

### [Responses]

- All items are currently under careful examination. We will **enrich disclosure details** at the start of 25-27 MTP

### [Responses]

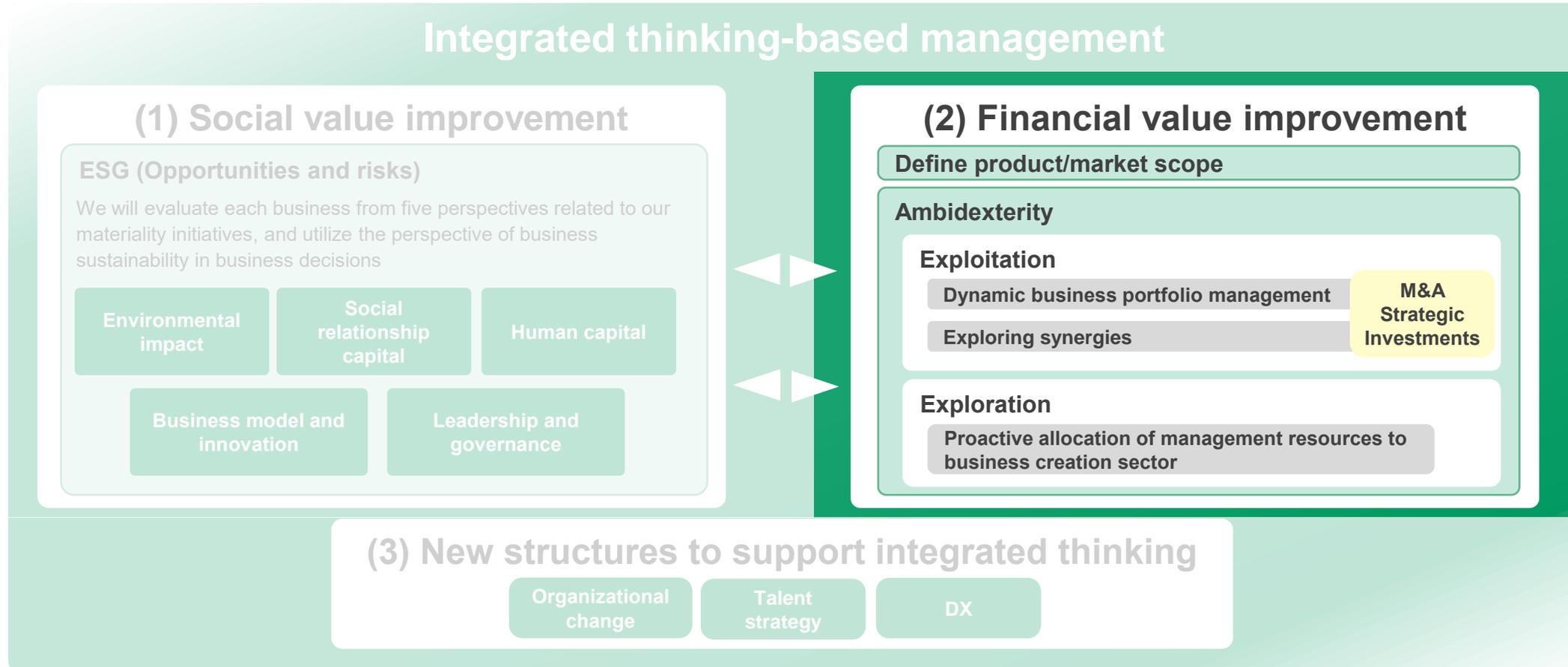
- We **accelerated** some of the expected measures above from FY2024 by the transition to a company with an Audit and Supervisory Committee  
We will **respond with more awareness than before from 25-27 MTP**





# Integrated Thinking-based Management

In order to achieve our vision based on Purpose, from April 2022, we conducted full-fledged introduction and promotion of Integrated thinking-based management, which aims to achieve both social and financial value improvement



# FY2023 Review of Business Valuation Matrix

Financial value improvement

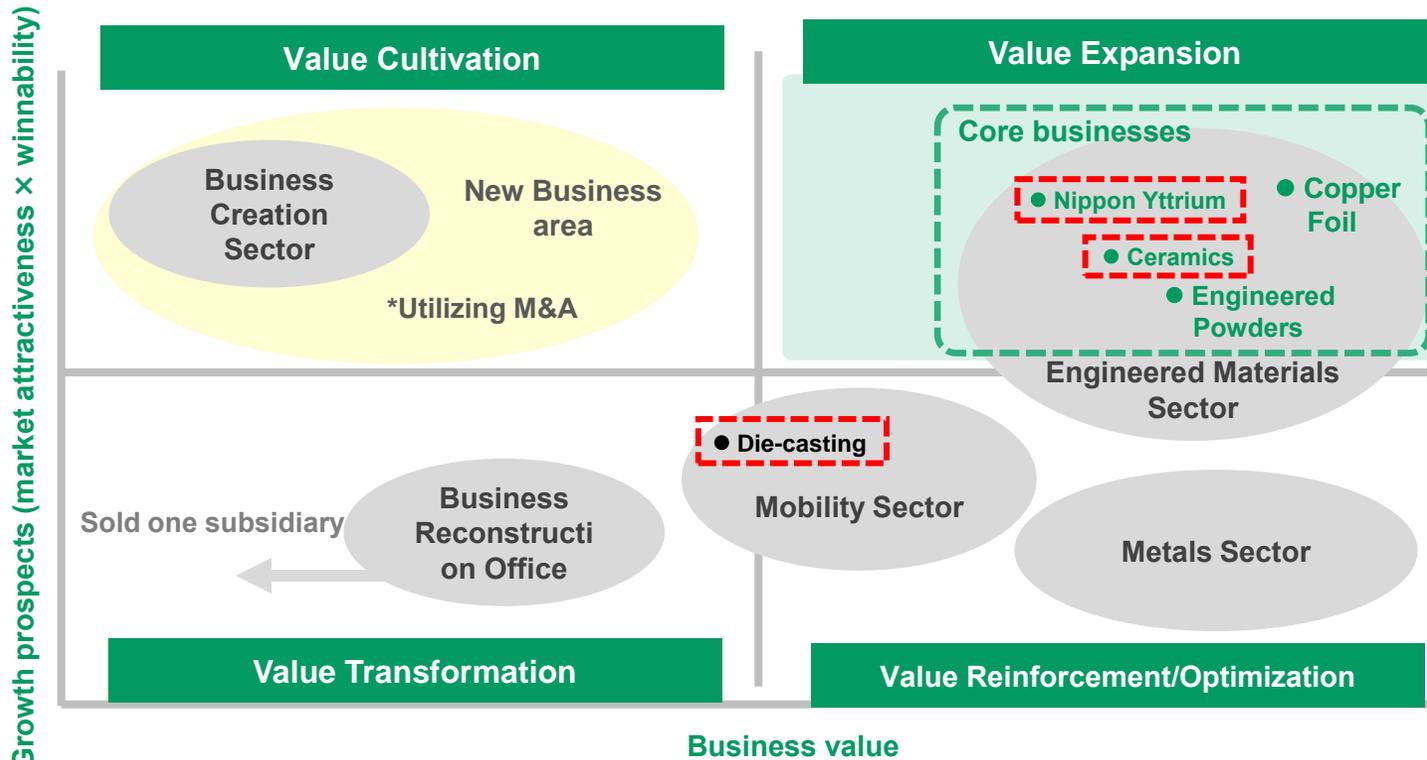
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**Added** Nippon Yttrium and Ceramics **to core businesses** through review of the matrix in FY2023. Started selling of subsidiaries under the umbrella of Business Reconstruction Office.

Going forward, we will implement **business expansion measures** including M&A in Value Expansion and Value Cultivation businesses and **searching best outside owners** centered on Value Transformation business

■ Business Valuation Matrix Change through FY2023 review of the matrix



## Value Expansion

- Conversion of Nippon Yttrium to a Wholly-Owned Subsidiary (New release on February 29, 2024)  
→ Aim to further increase business value through synergy creation (For details, see P28-29)

## Value Transformation

- Transfer of Shares of Consolidated Subsidiary Nihon Kessho Kogaku Co., Ltd. (News release on May 13, 2024)

To further improve capital efficiency, we will actively invest management resources in Value Cultivation and Value Expansion

# Capital Investment / Investment and Lending (M&A)

Financial value improvement

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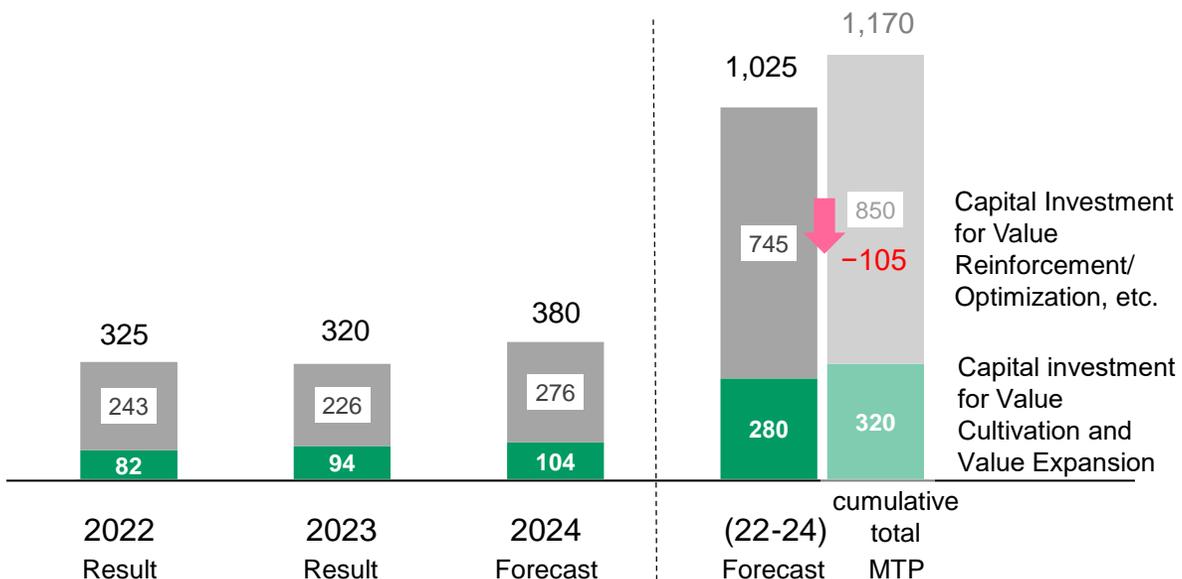


**Downwardly revised approximately 10 billion yen** for capital investment in **Value Reinforcement/Optimization**, as a result of the deterioration of business performance compared to 22-24 MTP.

Secured M&A budget in 22-24 MTP (20 billion yen in three years from 2022 to 2024). **Multiple projects are under consideration.**

## Trend in capital investment

(Unit: 100 million yen)



- Working to be ready to invest in Value Cultivation and Value Expansion immediately when opportunities are identified

## Investment and lending (M&A)

[FY2023 Result]

- Conversion of Nippon Yttrium to a Wholly-Owned Subsidiary

[FY2024 Forecast]

- Secured budget of 14 billion yen for FY2024. Multiple projects are currently under consideration

## Capital investment for Value Cultivation and Value Expansion

<b>Business Creation Sector</b>	<ul style="list-style-type: none"> <li>• Increase the production capacity of solid electrolyte A-SOLiD<sup>®</sup></li> <li>• Investment to increase production of HRDP<sup>®</sup>, etc.</li> </ul>
<b>Copper Foil</b>	<ul style="list-style-type: none"> <li>• Initiatives to increase production of MicroThin<sup>™</sup></li> <li>• New installation of processing machines for development and testing, etc.</li> </ul>
<b>Engineered Powders</b>	<ul style="list-style-type: none"> <li>• Expansion of production capacity of NANOBIX<sup>™</sup></li> <li>• New product development including iconos<sup>™</sup></li> </ul>

# Measures to Achieve Capital Cost and Stock Price Conscious Management

Financial value improvement



We **are accelerating** our initiatives to enhance our corporate value through measures to improve financial value and advance ROIC management

## (1) Measures to improve financial value

- Aim to increase earnings per share (EPS) and improve stock value multiple such as PER by steadily implementing the measures to improve financial value shown in 22-24 MTP

### Financial value improvement

#### Define product/market scope

#### Ambidexterity

##### Exploitation

Dynamic business portfolio management

Exploring synergies

M&A  
Strategic  
Investments

##### Exploration

Proactive allocation of management resources to business creation sector

## (2) Advance ROIC management

### 22-24 MTP (2022-24)

- Established ROIC as one of the indicators of business value and structured it to evaluate businesses with high capital efficiency in dynamic business portfolio management
- Improve company-wide ROIC by setting and achieving ROIC targets by business

- We are considering the following measures to further implement management with an emphasis on capital efficiency
  - **Calculate Weighted Average Cost of Capital (WACC) by business** and set an appropriate **ROIC target (ROIC spread: ROIC-WACC) by business**
  - Raise awareness of corporate value improvement and introduce company-wide measures to spread ROIC
  - Set indicators necessary for ROIC improvement at each company organization and respond to them (ROIC tree, etc.)
  - Introduce efficiency indicators (ROIC, etc.) into the performance measures of Directors and Senior Executive Officers

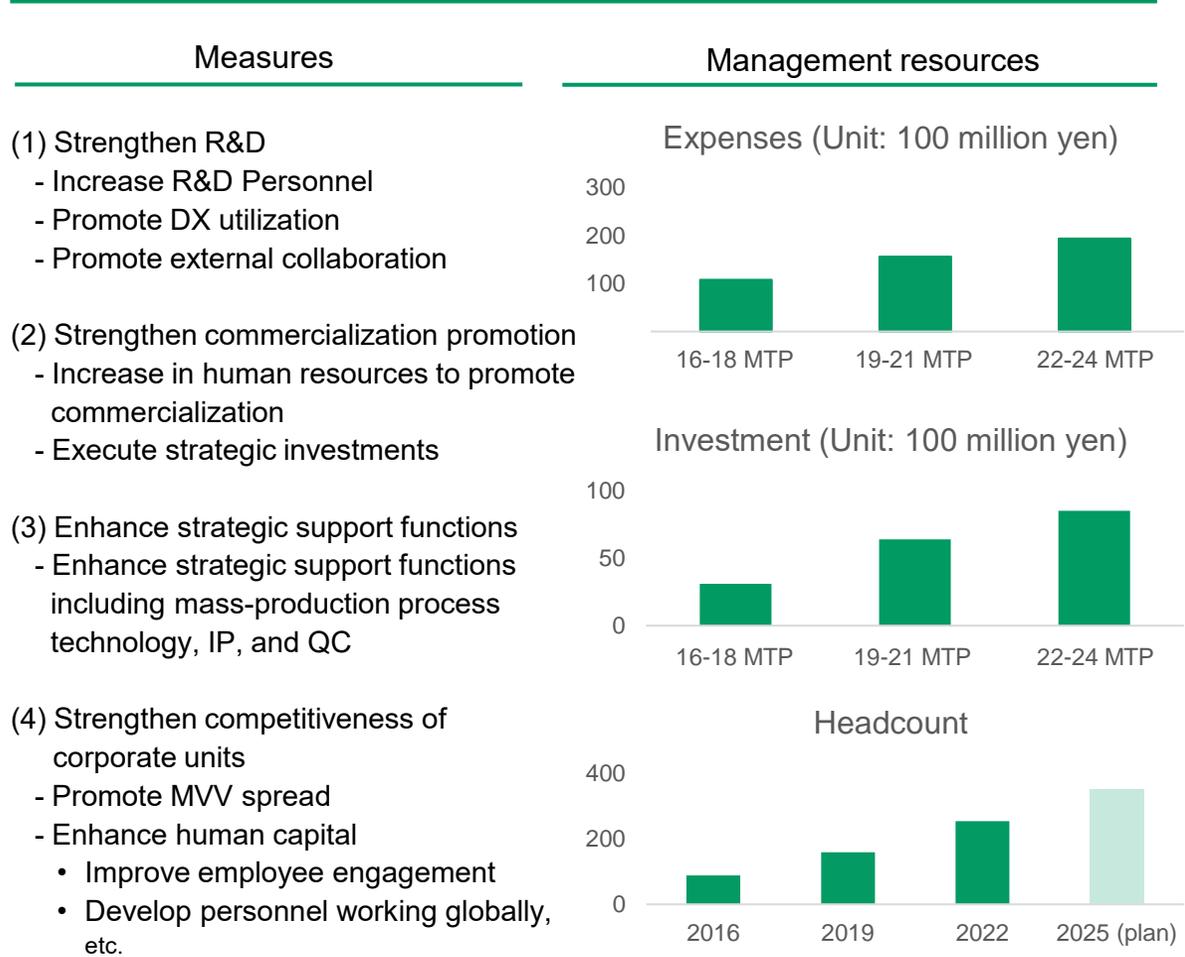
Aim to start ROIC management from 2025, the first year of next MTP

Financial value improvement  
 Value Cultivation

# Business Creation Sector (1) - 2030 Target of Business Creation Sector

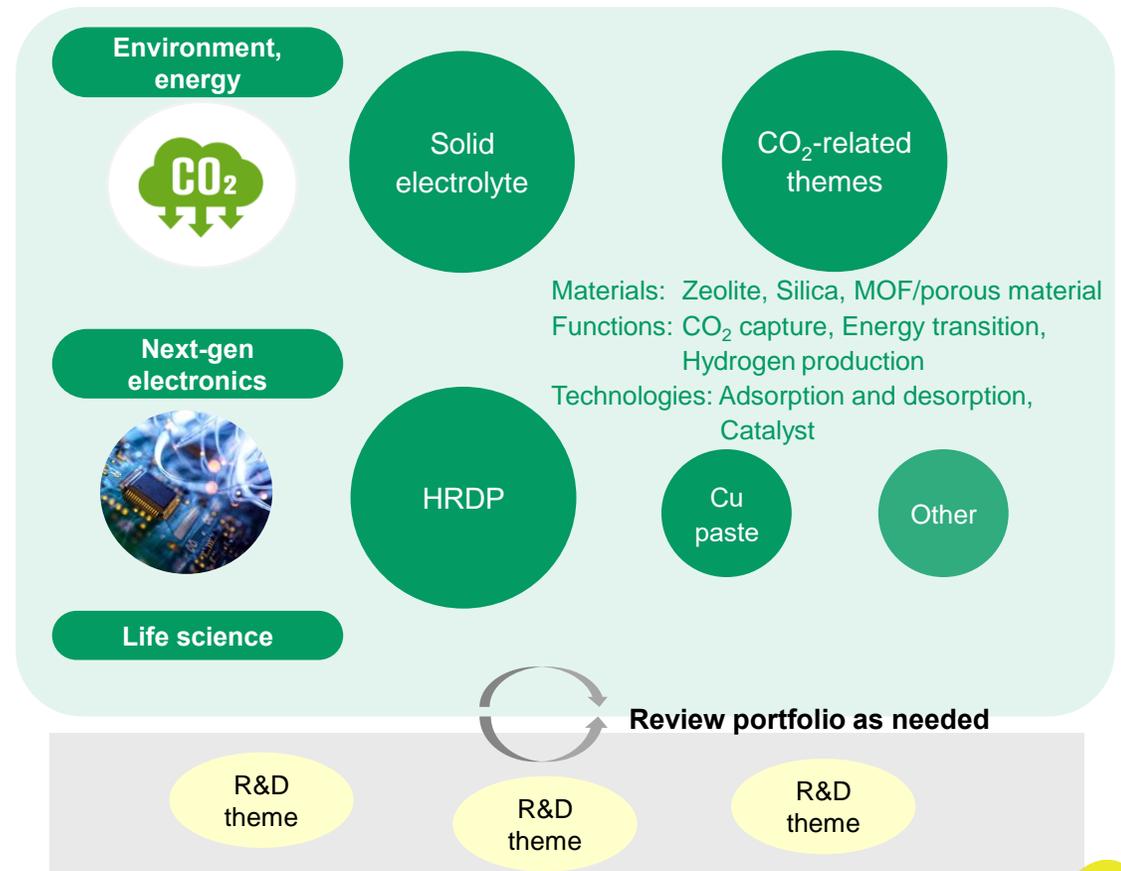
**Proactively invest** management resources with the goal of achieving contribution income of 10 billion yen\* or more in 2030 under the commercialization theme

## Key measures of Business Creation Sector



## 2030 target

Contribution income > 10 billion yen



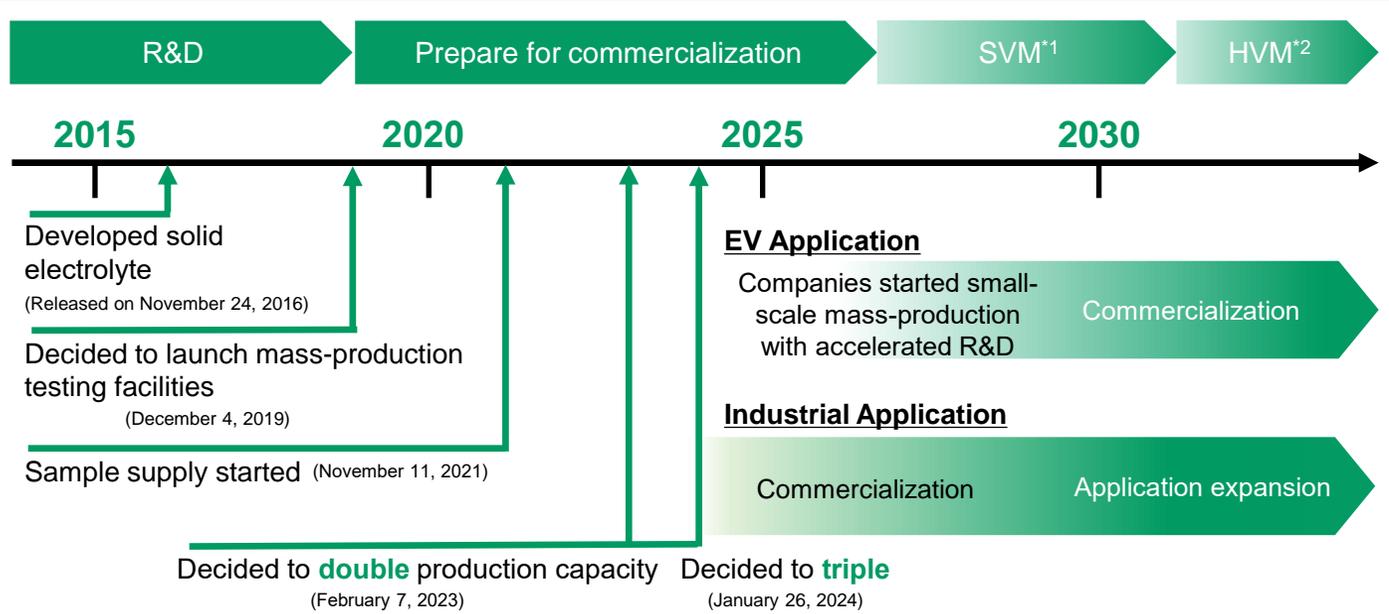
Financial value improvement  
 Value Cultivation

# Business Creation Sector (2) - A-SOLiD<sup>®</sup>, Solid Electrolyte for All-Solid State Battery (ASSB)

Vision for 2030 Establish a position as a leading company in solid electrolyte by contributing to realizing a decarbonized society through All-Solid State Battery (ASSB)

## Roadmap

\*1 Small Volume Manufacturing  
 \*2 High Volume Manufacturing



A-SOLiD<sup>®</sup> mass production testing building  
 (Ageo City, Saitama Prefecture)

### 2024

- Completed doubling of production capacity and **the facilities are operating as planned** (April)
- Inquiries are rapidly increasing** as companies accelerate development for **commercialization**
  - ➔ Currently considering new construction of **initial mass-production plant**

## Future Priority Measures

EV Application	
Environment	<ul style="list-style-type: none"> <li>Inquiries are rapidly increasing as companies accelerate development for commercialization in the late 2020s</li> </ul>
Initiatives	<ul style="list-style-type: none"> <li>Expand mass-production testing facilities to meet customer demands</li> <li>Co-create the EV market by providing high-quality solid electrolytes</li> <li>Work on process development and cost reduction for HVM</li> <li>Newly build initial mass-production plant for SVM</li> </ul>
Industrial Application	
Environment	<ul style="list-style-type: none"> <li>For all solid-state battery characterized by high-temperature environments and long life, Maxell has started receiving orders from Nikon in FY2024. Commercialization of all solid-state battery begins the year</li> </ul>
Initiatives	<ul style="list-style-type: none"> <li>Steady supply of stable quality solid electrolytes</li> <li>Expand product lineup to meet customer demand</li> <li>Expand applications/markets in collaboration with partners developing materials that meet customer/market needs</li> </ul>

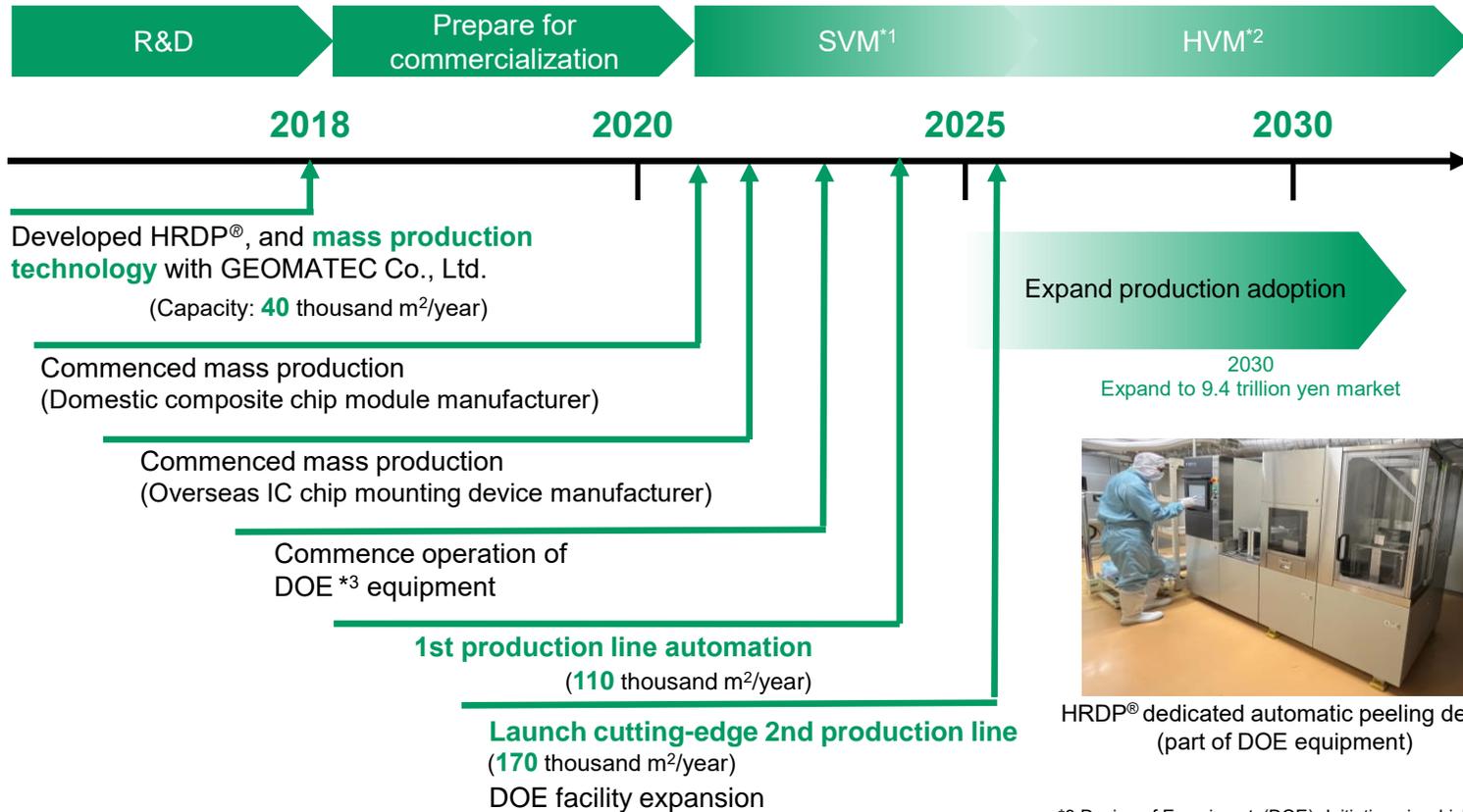
Financial value improvement  
 Value Cultivation

# Business Creation Sector (3) - HRDP® for Next-gen Chip PKG Device

Vision for 2030 Achieve a de-facto standard for packaging platforms for next-gen chip PKG devices

## Roadmap

\*1 Small Volume Manufacturing  
 \*2 High Volume Manufacturing



HRDP® dedicated automatic peeling device (part of DOE equipment)

## Future Priority Measures

Environment	<ul style="list-style-type: none"> <li>Inquiries are increasing for next-generation chip packages for 5G/6G, AI and high-performance computing</li> <li>Increase in development projects for mainstream customers as a result of production efficiency improvement (panelization, shorter cycle time) by adapting HRDP®</li> </ul>
Initiatives	<ul style="list-style-type: none"> <li>Strengthen marketing activities to end-manufacturers using DOE equipment</li> <li>Expand product lineup to meet customer demand</li> <li>2nd production line will start production in 2025 as planned</li> </ul>

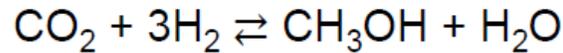
\*3 Design of Experiments(DOE): Initiatives in which we collaborate with customers to verify customer processes and to propose value for customers

## Business Creation Sector (4) - CO<sub>2</sub>-related Theme Initiatives

We aim to realize higher offered value with membrane reactor combining separation membrane and catalyst in collaboration with eSep\*1 and us holding catalyst technology

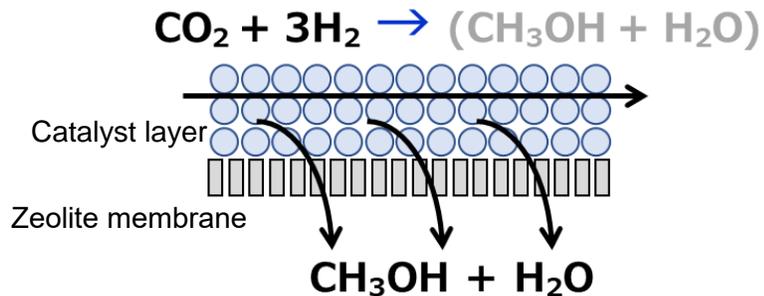
### Methanol production from CO<sub>2</sub> through membrane reactor

#### CO<sub>2</sub>-Methanol production reaction



CH<sub>3</sub>OH theoretical yield = **around 20%** (250°C, 5MPa)

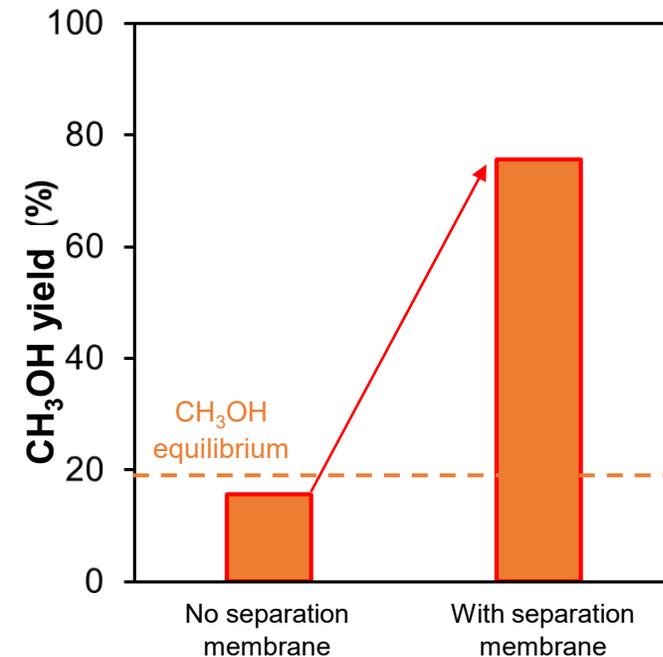
#### Mechanism of membrane reactors



Selectively separates products to accelerate reactions  
and increase yields

### Lab-scale test results

Confirmed it **is possible to break** theoretical yield with  
separation membrane\*2



\*1 News Release on July 28, 2022: Investment in Environmental Energy Venture Company "eSep"  
(Develop, manufacture and sell functional separation membranes made of ceramics)

\*2 Already announced at The 36th Fall Meeting of The Ceramic Society of Japan

# Engineered Materials Segment - Progress of 2022-2024 Mid-Term Plan

Financial value improvement  
Value Expansion

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## Vision for 2030

In FY2030, net sales of 180 billion yen, real profit of 40 billion yen, at least 70% of newly launched products, and at least 50% sales ratio of environmentally friendly products

## Progress of major strategies of 2022-2024 Mid-Term Plan

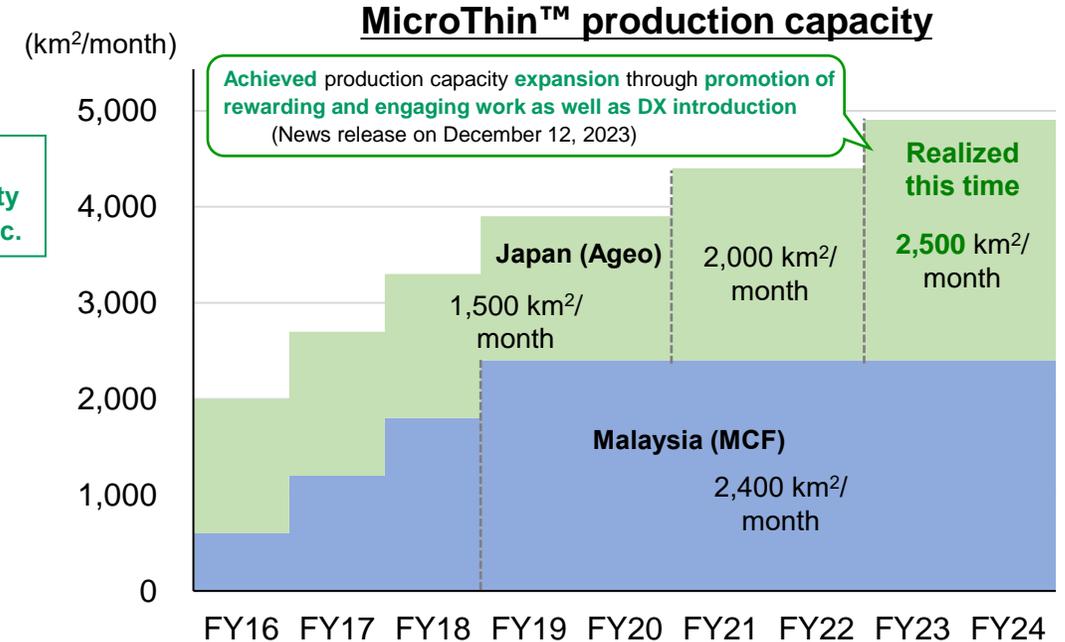
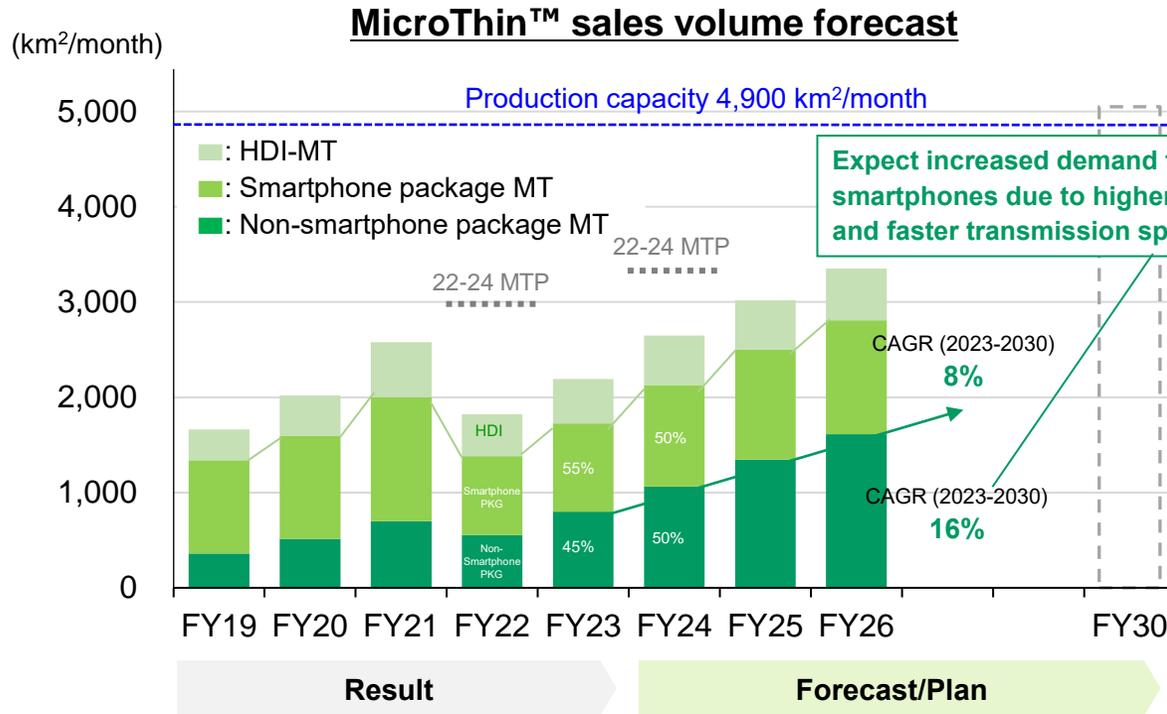
Held a business briefing session regarding copper foil, engineered powders and Nippon Yttrium on January 12, 2024

	Major strategies of 2022-2024 Mid-Term Plan	Evaluation	Progress and future initiatives	
Copper foil	<ul style="list-style-type: none"> <li>Fully prepared for the expansion of markets and applications for MicroThin™</li> <li>(1) Entering new markets (2) Supply capacity maximization and further expansion</li> </ul>	FY22 → FY23 Positive → Positive	(1) <b>Increased adoption of HDI MSAP</b> (Positive) (2)-1 <b>Progress of transfer from PKG-MT to Malaysia</b> (Positive) (2)-2 <b>Expansion of production capacity at Ageo operation site</b> (Positive) (Expanded monthly production capacity to 2.5 million m <sup>2</sup> in Ageo or 4.9 million m <sup>2</sup> including Malaysia)	P24
Engineered powders	<ul style="list-style-type: none"> <li>Maximize profits from existing products (expand sales of copper powders for electrical materials and abrasives)</li> <li>New product launches (iconos™*, copper powders for 3D printer, etc.)</li> </ul>	Neutral → Neutral	<ul style="list-style-type: none"> <li><b>Existing products did not reach target due to external factors</b> (Negative)</li> <li><b>New products are performing well centered on iconos™ (Positive)</b></li> </ul>	P26 P27
PVD materials	<ul style="list-style-type: none"> <li>Develop new products for the future by implementing cost reductions through production innovation while securing appropriate margins</li> </ul>	Positive → Neutral	<ul style="list-style-type: none"> <li>Although price correction and cost reduction are proceeding as planned, price competition in general-purpose products market is further intensifying (Negative)</li> <li>Development of new product (high value-added product) is going well (Positive)</li> </ul>	
Ceramics	<ul style="list-style-type: none"> <li>Expand sales of new products including next-gen setters</li> </ul>	Positive → Positive	<ul style="list-style-type: none"> <li>Steady progress in sales expansion for next-gen setters, 3D ceramic moldings, etc. (Positive)</li> </ul> <p><b>Change to Value Expansion business</b></p>	

\*iconos™: Rare metal liquid solution

# Copper Foil (1) - MicroThin™ Sales Volume Forecast and Production Capacity

Although the FY2024 sales volume of MicroThin™ **fell short** of the 22-24 MTP target, **the growth story** toward 2030 **remains unchanged**. The existing production capacity is sufficient to cater to present demand. **Achieved further increase** by improving productivity, etc. in FY2023



- Competitive situation remains unchanged: Share for PKG >95%, Share for HDI: 100%
- For packaging: Increased demand in non-smartphone segment due to higher capacity and faster transmission speeds, etc.
- For HDI: Expanded MSAP adopted models for Chinese smartphone manufacturers

## MicroThin™ profitability improvement

- **Passing on** various cost-increasing factors **to selling prices**
- Expand sales of **new value-added products (GN)** and improve sales mix
- **Promote production transfer of products** for packaging to Malaysia (Effectively utilize both business locations)
- Speed up product development **by using a new development test processing machine**

# Copper Foil (2) - Sales Performance and Forecast of High Grade VSP™ (Very Smooth Profile Copper Foil)

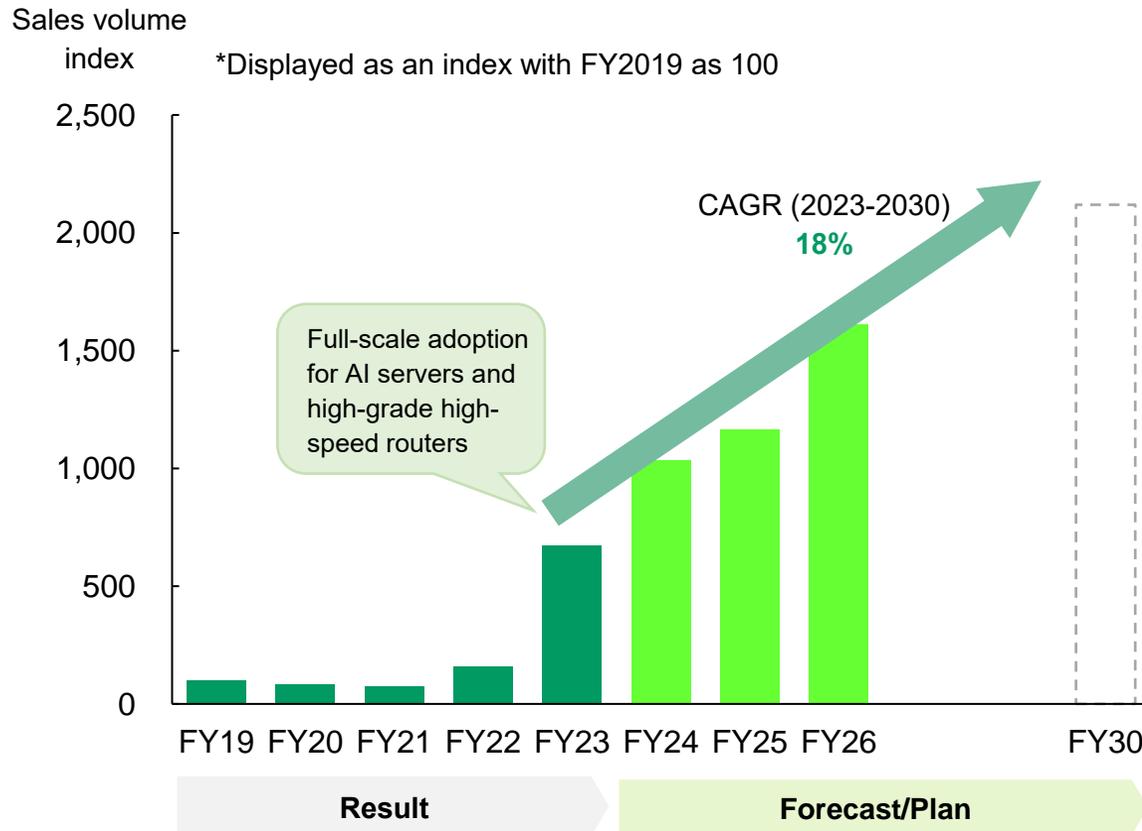
January 12, 2024  
Reprinted version of business briefing session material regarding copper foil, engineered powders

Financial value improvement  
Value Expansion



Amidst the future growth of the market for AI servers and other information and telecommunications infrastructure, **expanding demand** of high grade VSP™ foil for high speed transmission **is expected**

## Sales performance and forecast of high grade VSP™



## Market and our initiatives

- FY2022 and earlier
  - Promoted initiatives for stable supply of regular products
  - Promoted high-grade products to new customers
- FY2023
  - **Began full-scale mass production** and adoption of high-grade products for AI servers, high-speed routers, etc.
- FY2024 onwards
  - Expect to increase volume of high-grade products in the long term due to market share expansion

For future demand growth, our initial responses are to improve product mix of electro-deposited copper foil and to increase production capacity by improving productivity

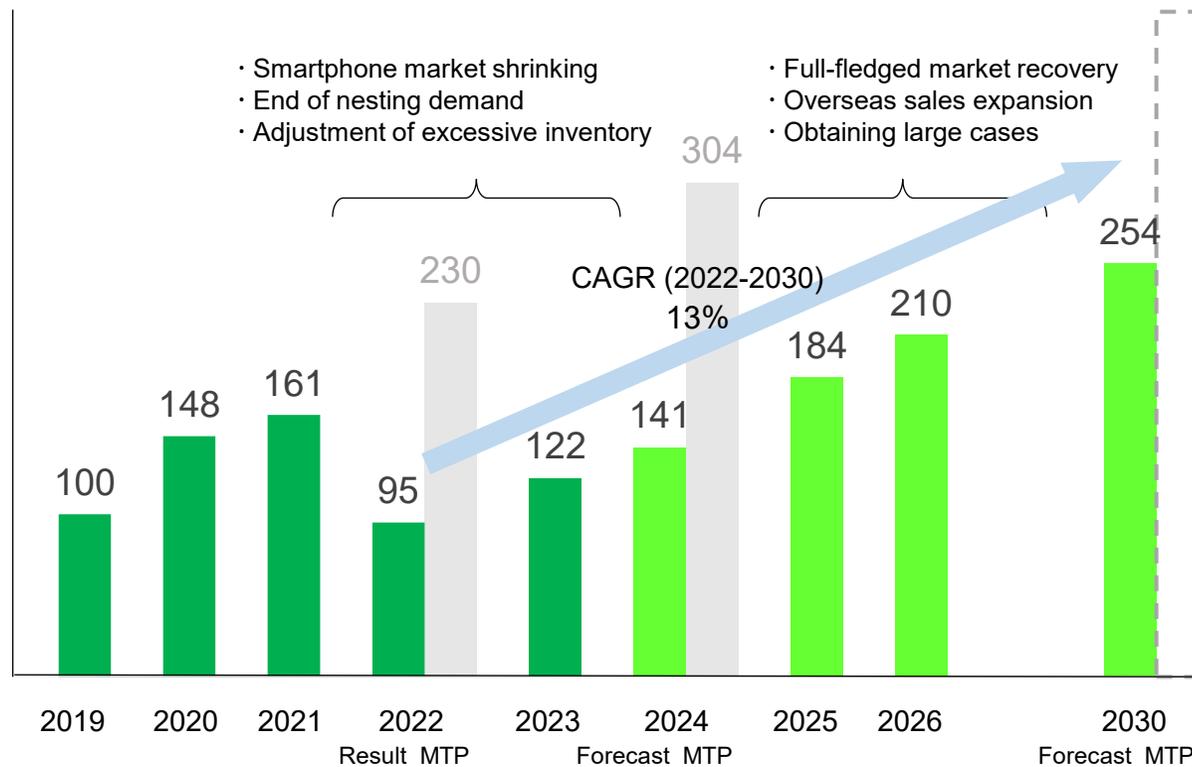


# Engineered powders (1) - Sales Performance and Forecast of Copper Powders

**Sharply downgraded sales forecast** of Copper Powders in line with MLCC market growth forecast revision. Current performance is expected to grow, reflecting overseas sales expansion. **Growth rate is higher** than MLCC market CAGR (6%)

## Sales performance and forecast of Copper Powders

Index



## Market and our initiatives

● FY2022 and earlier

[Market] Large-scale production cutbacks by MLCC manufacturers due to the market slowdown in China

Prolonged inventory adjustment due to the backlash of accumulated MLCC inventory in FY2021

[Our company] Delayed major development project launches

● FY2023

[Market] MLCC market in recovery phase from bottom

[Our company] Prepared for MLCC market re-growth

- Developed new overseas customers and recruited new employees
- Prepare to enhance competitiveness by enhancing the capabilities of our production technology.

● FY2024 onwards

[Market] Phase of MLCC market recovery and re-growth

[Our company] Track MLCC market growth and expand market share

- Increase sales to existing customers in China
- Expand our share in the market by making the most of our technological capabilities
- Increase in demand for in-vehicle use

Expand applications to other than MLCC market



# Engineered Powders (2) - Status of New Product Development

**Expanded Production Capacity** of Abrasive for SiC wafers (NANOBI<sup>TM</sup>). **Steady progress** in development of rare metal liquid solution (iconos<sup>TM</sup>) that has a great impact on the market

## Abrasive for SiC wafers – NANOBI<sup>TM</sup>

Product outline	<ul style="list-style-type: none"> <li>A two-pack abrasive for power devices consisting of manganic oxide base abrasive grain liquid and oxidant liquid for SiC wafers</li> </ul>	<p><u>Abrasive for SiC wafers</u></p>
Features	<p>Compared to existing silica abrasive/alumina abrasives,</p> <ul style="list-style-type: none"> <li>Capable of grinding SiC wafers faster with less damage</li> <li>Easier to remove the abrasive grains after grinding SiC wafers</li> </ul>	<p><u>Observation image of SiC wafers (SICA)</u></p>
Status	<ul style="list-style-type: none"> <li>Completed the plant design for 50 t/year production capacity. Production capacity expansion will be completed in September 2024</li> <li>Adopted by three customers in Japan, one customer in China. Under evaluation by several companies in US, EU and other areas</li> <li>Further demand growth is expected in the future as SiC semiconductors become more widespread (Market scale of abrasive for SiC wafers: 170 million USD/2029)</li> </ul>	

## Rare metal liquid solution – iconos<sup>TM</sup>

<ul style="list-style-type: none"> <li>Liquid with insoluble metals such as rare metals dissolved in an aqueous solvent (Chemical element: Nb, Ta, Mo, Ti, etc.)</li> </ul>	<p><u>Photo of prototypes (example)</u></p>
<p>Compared to existing rare metal-based liquid solutions,</p> <ul style="list-style-type: none"> <li>Free of strong acidic chemicals such as hydrofluoric acid. Excellent in safety and handling</li> <li>Highly reactive. Capable of forming uniform, thin coatings on a variety of materials</li> </ul>	<p>Nb coated glass          Coating thickness (cross-section picture)</p>
<ul style="list-style-type: none"> <li>Developed iconos<sup>TM</sup>, the unprecedented new materials will have a major impact on the inorganic material market (News release on March 28, 2024)</li> <li>Expected income in 2030 is over one billion yen/year. Currently several projects in progress</li> <li>Expected further application development by leveraging the features of iconos<sup>TM</sup></li> </ul>	

# Nippon Yttrium (1) Conversion to a Wholly-Owned Subsidiary

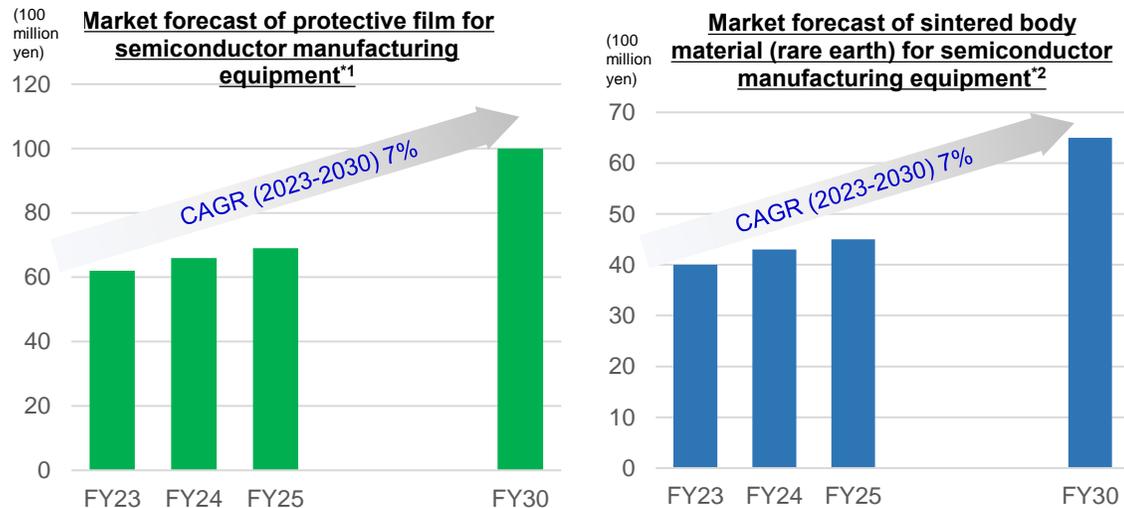
Financial value improvement  
Value Expansion

We promote the well-being of the world  
through a spirit of exploration  
and diverse technologies.



As of March 1, 2024, Nippon Yttrium, one of the few rare-earth integrated manufacturers in Japan, **became a wholly owned subsidiary**. By making Nippon Yttrium a wholly owned subsidiary, we **are steadily implementing** initiatives in the advanced materials field to create synergies with our business of engineered powders and rare metals, which are adjacent to Nippon Yttrium's business areas

## Growth potential



Nippon Yttrium are engaged in manufacturing, sales, and development of protective film materials protecting inner walls of cutting-edge semiconductor manufacturing equipment (etching equipment) from plasma gas

Keep the world's No. 1 position in the market of protective film materials for semiconductor manufacturing equipment toward 2030, and achieve increased income through differentiated products accurately capturing user needs in electronic materials and medical field materials

\*1, \*2: Forecasts based on materials prepared by research firms

## Initiatives for creating synergies

	Engineered Powders Division	Nippon Yttrium
Business area	<ul style="list-style-type: none"> <li>Electronics</li> <li>Electronic components, batteries</li> <li>Energy</li> </ul>	<ul style="list-style-type: none"> <li>Semiconductor manufacturing equipment</li> <li>Electronic components, batteries</li> <li>Medicine</li> </ul>
Technological domain	<ul style="list-style-type: none"> <li>Several powder production technologies</li> <li>Solvent extraction/solution technologies</li> </ul>	<ul style="list-style-type: none"> <li>Solvent extraction/powder technologies</li> <li>Ultra high purification</li> </ul>
Major products	<ul style="list-style-type: none"> <li>Rare metals</li> <li>Metal powder</li> </ul>	<ul style="list-style-type: none"> <li>Rare earths</li> <li>Yttrium compounds</li> </ul>

- Accelerate new product development in the advanced materials field
- Improving efficiency of rare earth recycle<sup>\*3</sup>
- Channel expansion and optimization of product sales/raw material procurement, etc.

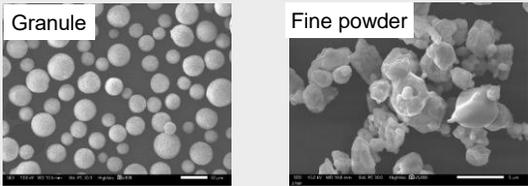
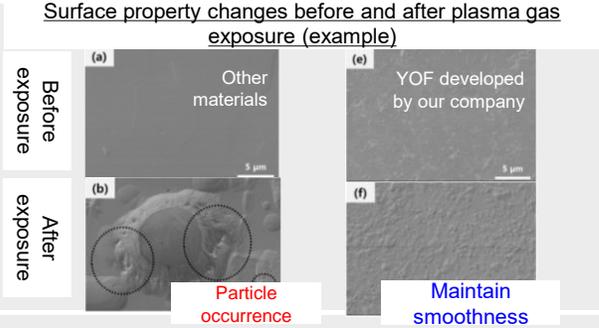
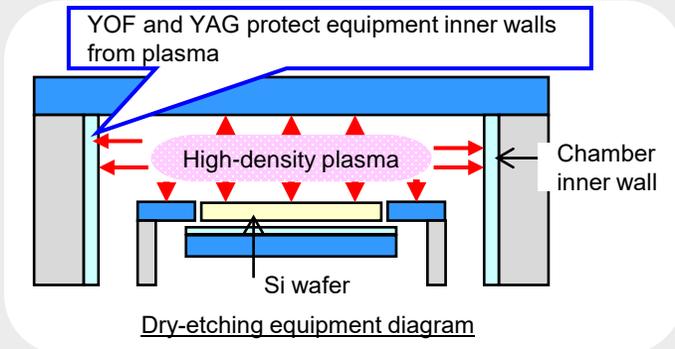
Achieve further business value enhancement through synergy creation

\*3: Started taking part in JOGMEC project (highly efficient solvent extraction project) in 2022

Financial value improvement  
 Value Expansion

# Nippon Yttrium (2) -Protective Film Materials for Semiconductor Manufacturing Equipment-

Nippon Yttrium is **the industry leader** of protective film materials for etching equipment supporting cutting-edge semiconductor manufacturing processes. **Contributes to yield improvement of semiconductor devices** by reducing extraneous particle occurrence

Outline of developed products	
Product outline	<ul style="list-style-type: none"> <li>Yttrium Oxyfluoride: YOF</li> <li>Yttrium Aluminum Garnet: YAG (Yttrium Aluminum Garnet)</li> </ul> 
Features	<ul style="list-style-type: none"> <li>YOF ⇒ High corrosion resistance for fluorinated plasma gases</li> <li>YAG ⇒ High corrosion resistance for chlorinated plasma gases</li> </ul> <p>Surface property changes before and after plasma gas exposure (example)</p> 
Applications	<p>Protect inner walls of etching equipment used for semiconductor manufacturing process from plasma gas</p>  <p>Contribute to yield improvement by reducing particles occurred due to inner wall damage</p>

### Market scale and progress of product development

[Market scale]

- Market scale of protective film for semiconductor manufacturing equipment  
 7 billion yen in 2025, 10 billion yen in 2030
- \* Our developed products are used for advanced materials in this market.  
 The advanced materials market is approximately 20%

[Competing materials]

- Currently none in cutting-edge materials market (YOF, YAG: Patent acquired for the relevant application)

[Progress]

- YOF:  
 Adopted for current cutting-edge manufacturing line  
 Under evaluation for next generation
- YAG:  
 Adoption decided by US major manufacturing equipment manufacturer  
 Since December 2023

# Metals Segment - Progress of 2022-2024 Mid-Term Plan

We promote the well-being of the world through a spirit of exploration and diverse technologies.



Financial value improvement  
Value Reinforcement/Optimization

## Vision for 2030

We are indispensable in efforts to build a sustainable society We have a recycling network underpinned by our distinctive characteristics, and we use it to provide new metals and minerals for renewable energy

## Progress of major strategies of 2022-2024 Mid-Term Plan

	Major strategies of 2022-2024 Mid-Term Plan	Evaluation	Progress	
Metals Sector	<ul style="list-style-type: none"> <li>Build an advanced recycling network leveraging our unique and diverse smelting assets</li> </ul>	FY22 → FY23	<ul style="list-style-type: none"> <li>Plan and steer an overall optimal strategy using the recycling network of seven domestic smelting plants</li> <li><b>Developed and implemented facility management systems and operational data collection systems</b> for digital infrastructure development in <b>Hachinohe Smelting</b></li> <li>Conducted a demonstration test of 70% biomass fuel substitution in Miike Smelting</li> <li><b>Conducted a demonstration test to introduce small equipment for CO<sub>2</sub> capture test</b> being developed by Business Creation Sector to <b>Hachinohe Smelting</b></li> </ul>	P31
		Positive → Positive		P33
Zinc and lead	<ul style="list-style-type: none"> <li>Leverage existing assets to expand industrial waste disposal business</li> </ul>	Positive → Positive	<ul style="list-style-type: none"> <li>Achieved revenue from waste disposal business surpassing MTP target following the tailwind of expanding waste disposal needs associated with a shift back to domestic manufacturing</li> </ul>	
	<ul style="list-style-type: none"> <li>Margin increase in raw materials due to increase in complex ore disposal</li> </ul>	Positive → Neutral	<ul style="list-style-type: none"> <li>Complex ore disposal in <b>Hachinohe Smelting</b> achieved year-on-year increase in collection volume, but failed to reach the MTP target</li> </ul>	
	<ul style="list-style-type: none"> <li>Newly contribute to income through increased collection and disposal of lead-based raw materials</li> </ul>	Positive → Positive	<ul style="list-style-type: none"> <li>Search for disposal needs of intermediate products containing valuable metals (recycled raw materials) at external overseas smelters to utilize our smelting network of zinc, lead and copper</li> </ul>	
Copper and precious metals	<ul style="list-style-type: none"> <li>Improve margins from increased smelting of profitable raw materials</li> </ul>	Positive → Positive	<ul style="list-style-type: none"> <li><b>Realized improvement in raw material margins throughout Metal Sector by utilizing Hibi Smelter (Tamano city, Okayama Prefecture)</b></li> </ul>	P32
	<ul style="list-style-type: none"> <li>Reduce costs by improving operations and investing more judiciously</li> </ul>	Positive → Positive	<ul style="list-style-type: none"> <li>Control fixed repair costs through more judicious capital investment</li> </ul>	
Mineral resources	<ul style="list-style-type: none"> <li>Explore new mining opportunities in Huanzala and Pallca</li> </ul>	Positive → Neutral	<ul style="list-style-type: none"> <li>Started feasibility study. In process of obtaining mining permit</li> </ul>	

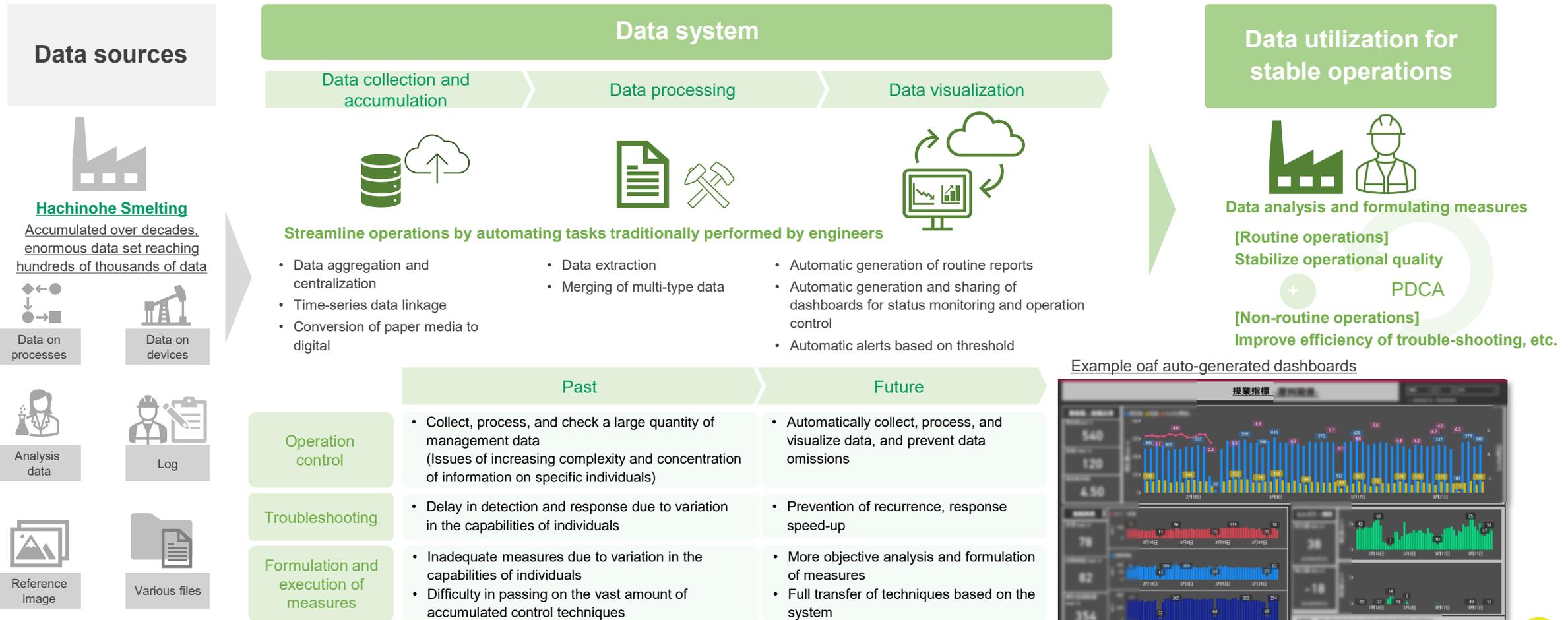
# Metals Segment (1) - DX Initiatives (Hachinohe Smelting)

We promote the well-being of the world through a spirit of exploration and diverse technologies.



Financial value improvement  
Value Reinforcement/Optimization

As part of our company-wide DX initiatives, set **Hachinohe Smelting** as the model of DX initiatives. **Improved operational efficiency** by implementing digitization for facility management and operational data sharing/utilization. Under planning of further Data utilization for stable operations as well as **application to other business locations**



# Metals Segment (2) - Smelting Network Deepening

We promote the well-being of the world through a spirit of exploration and diverse technologies.



Financial value improvement  
Value Reinforcement/Optimization

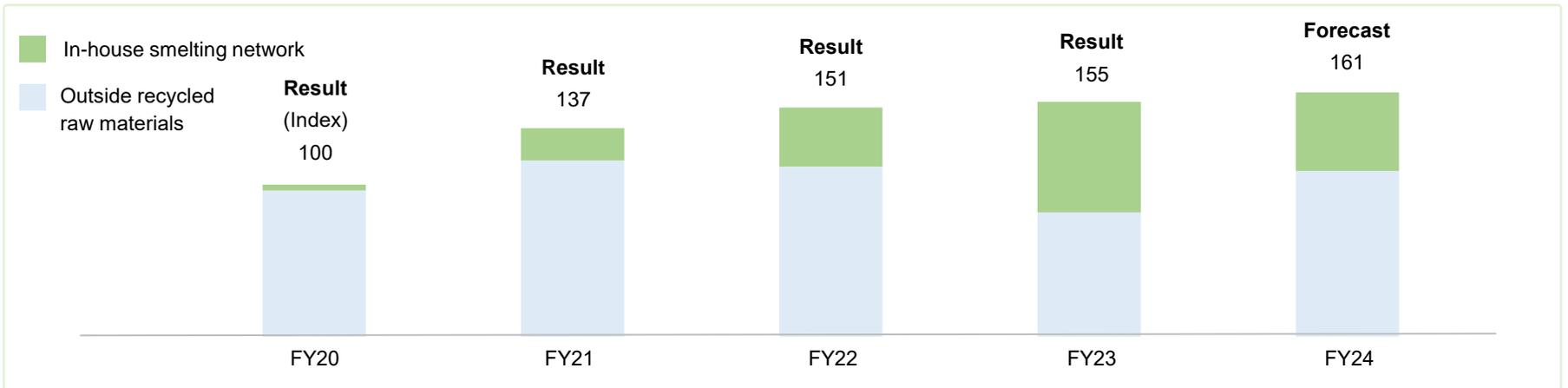
We are working on **improving raw material margins** across the Group through disposal of raw materials and intermediate smelting products (recycled raw materials) utilizing our smelting network of zinc, lead and copper

## Utilizing our smelting network of zinc, lead and copper (internal)

## Contribution to building a recycling-based circular society (outside)



**Hibi joint smelting recycled raw material processing effect (Price index)**



# Metals Segment (3) - CO<sub>2</sub> Capture and Separation Demonstration Test in Hachinohe Smelting

Financial value improvement  
Value Reinforcement/Optimization

We aim to develop and demonstrate technologies for CO<sub>2</sub> capture and separation from factory exhaust gases with CO<sub>2</sub> adsorbent developed by Business Creation Sector.

Conducted demonstration test at **Hachinohe Smelting** in April 2024 and **obtained good results** for practical application in 2030 and beyond



## Small size CO<sub>2</sub> separation and capture equipment (exterior)

Completed production of small size CO<sub>2</sub> separation and capture equipment. Installed the equipment at **Hachinohe Smelting** and conducted demonstration test to separate and capture CO<sub>2</sub> from smelting furnace gas emitted at the smelter in April 2024

Adsorption filter A    Adsorption filter B



[Result]

- Confirmed CO<sub>2</sub> capture rate of approximately 90%
- Similar result to the test with the model gas in our research institute

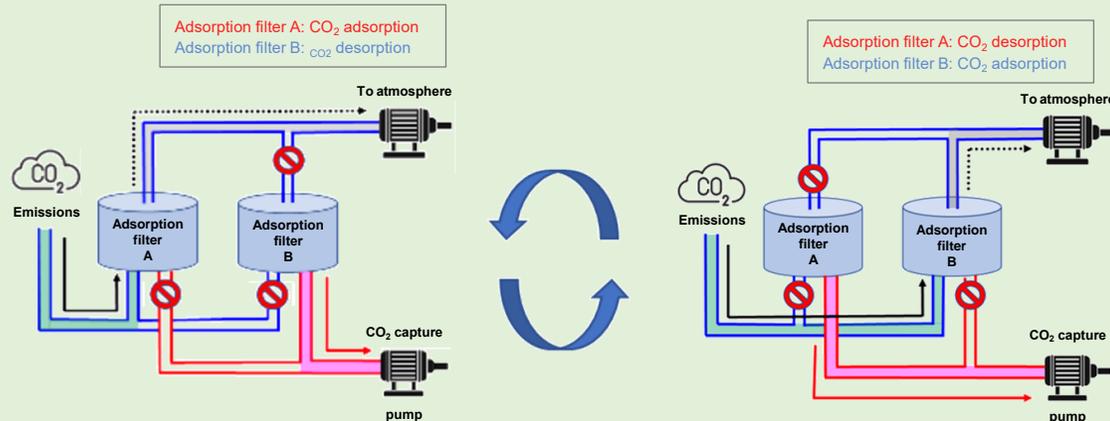


[Features]

- High adsorption/desorption capacity (Shorter cycle time)
- Low energy consumption to capture CO<sub>2</sub> (Lower running costs)

## CO<sub>2</sub> separation and capture system

Adopt VSA (vacuum swing adsorption) system with CO<sub>2</sub> adsorbent newly developed by our company. Alternately adsorb and desorb CO<sub>2</sub> through two parallelized adsorption filters



# Mobility Segment - Progress of 2022-2024 Mid-Term Plan

Financial value improvement  
Value Reinforcement/Optimization

We promote the well-being of the world  
through a spirit of exploration  
and diverse technologies.



## Vision for 2030

Pioneer of a mobility society that continues to identify and create values to be chosen. New products sales ratio of more than 50%, ordinary income of 20 billion yen, and zero recall

## Progress of major strategies of 2022-2024 Mid-Term Plan

Mobility segment in 22-24 MTP should be **carefully monitored progress**

	Major strategies of 2022-2024 Mid-Term Plan	Evaluation	Progress	
Mobility Sector	<ul style="list-style-type: none"> <li>Explore and realize business synergies (short/medium/long term)</li> <li>Develop and promote new business in response to changes in the business environment</li> </ul>	FY22 → FY23 Positive → Positive	<ul style="list-style-type: none"> <li>Working on synergy expansion through best practice development including production process improvement and cost reduction methods (Neutral)</li> <li>Promoting sales expansion by utilizing sales channels and market information (Positive)</li> </ul>	
Catalyst	<ul style="list-style-type: none"> <li>Maintain and strengthen technical development capabilities for differentiation</li> <li>Enhance manufacturing efficiency in production, development, asset compression, etc.</li> <li>Create a winning scenario from a medium- to long-term perspective by leveraging our strengths</li> </ul>	Positive → Positive	<ul style="list-style-type: none"> <li>Introduced MI<sup>+</sup> and started operation. Promoting DX for development/manufacturing/finance (Positive)</li> <li>Medium term: <b>Prior development to comply with new regulations, focusing on catalysts for motorcycles</b> (Positive)</li> <li>Long term: <b>Reduced development of catalysts for four-wheeled vehicles and shift in development to environmentally friendly products</b> (Positive)</li> </ul>	P35
Mitsui Kinzoku ACT	<ul style="list-style-type: none"> <li>Strengthen competitiveness of cost and quality by deepening global optimum production and smart factory</li> <li>Aim to transform into a system supplier by focusing on the development and sales expansion of electric system products</li> </ul>	Neutral → Neutral	<ul style="list-style-type: none"> <li>Implementing business restructuring in response to changes in the business environment in China and Japan (Positive)</li> <li>Plan and implement restructuring measures for business in North America (Neutral)</li> <li><b>Accelerate development of electric door system products in Japan, U.S., and China markets</b> (Neutral) -Electric Frunk Lock: Selected by a Japanese manufacturer as a leading developer</li> </ul>	P36
Die-casting	<ul style="list-style-type: none"> <li>Business restructuring and generation of appropriate profits</li> </ul>	Neutral → Negative	<ul style="list-style-type: none"> <li>Create sales/technology synergies as a consolidated company (Neutral)</li> <li>Currently working to expand product sales for EVs (Neutral)</li> <li>Unachieved cost improvement in Nirasaki area (Negative) Promoting use of external knowledge in addition to synergy initiatives by consolidating Kamioka and Nirasaki</li> </ul>	

# Catalyst - Trends in Sales Volume for Motorcycles and Automobiles

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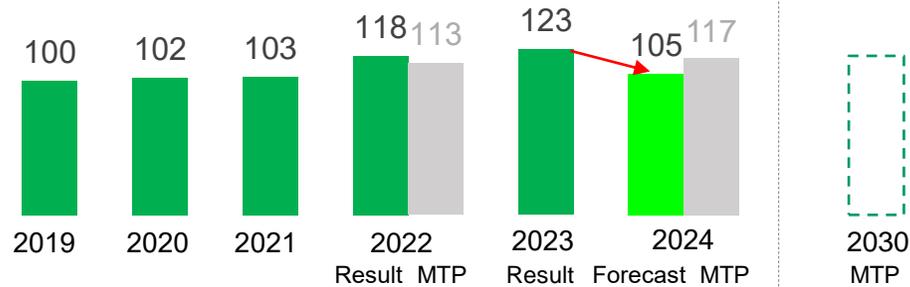
Financial value improvement  
Value Reinforcement/Optimization

For motorcycles, **increased sales** in Southeast Asia and South America in FY2023. For automobiles, **did not achieve the original plan** in FY2024 despite **contribution** of GPF\* sales.

Collaborating with Business Creation Sector for developing environmentally friendly products in order to **create new businesses that contribute to CN** based on exhaust gas catalyst technology in the long run

## Sales results and forecasts of motorcycle catalysts

(Let 2019 be 100)



### FY2022/23 sales volume

- Sales in Southeast Asia and South America increased over plan
- Temporary increase in orders received in India in FY2023

### FY2024 sales volume

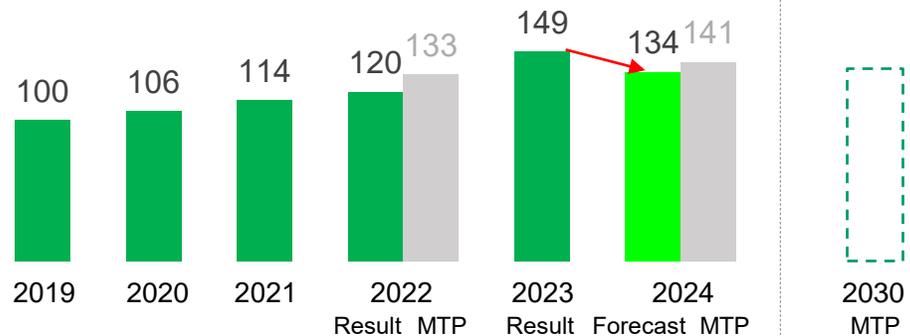
- Competition expected to escalate in India

### Future Strategy

- Maintain market share by complying with new regulations in each country and by complying with precious metal regulations (50% global market share)

## Sales results and forecasts of automobile catalysts

(Let 2019 be 100)



### FY2022/23 sales volume

- Lower sales than planned due to shortage of semiconductors in FY2022
- Sales strong in the U.S. and India, despite weak sales in China in FY2023

### FY2024 sales volume

- Market shrink due to accelerated electrification. The China market in particular is quickly shifting

### Future Strategy

- While continuing to develop technologies to meet the next regulations of each country and to save precious metals, we will focus on developing **environmentally friendly products** in collaboration with Business Creation Sector

# Mitsui Kinzoku ACT - Expand Sales of Electric Door Systems

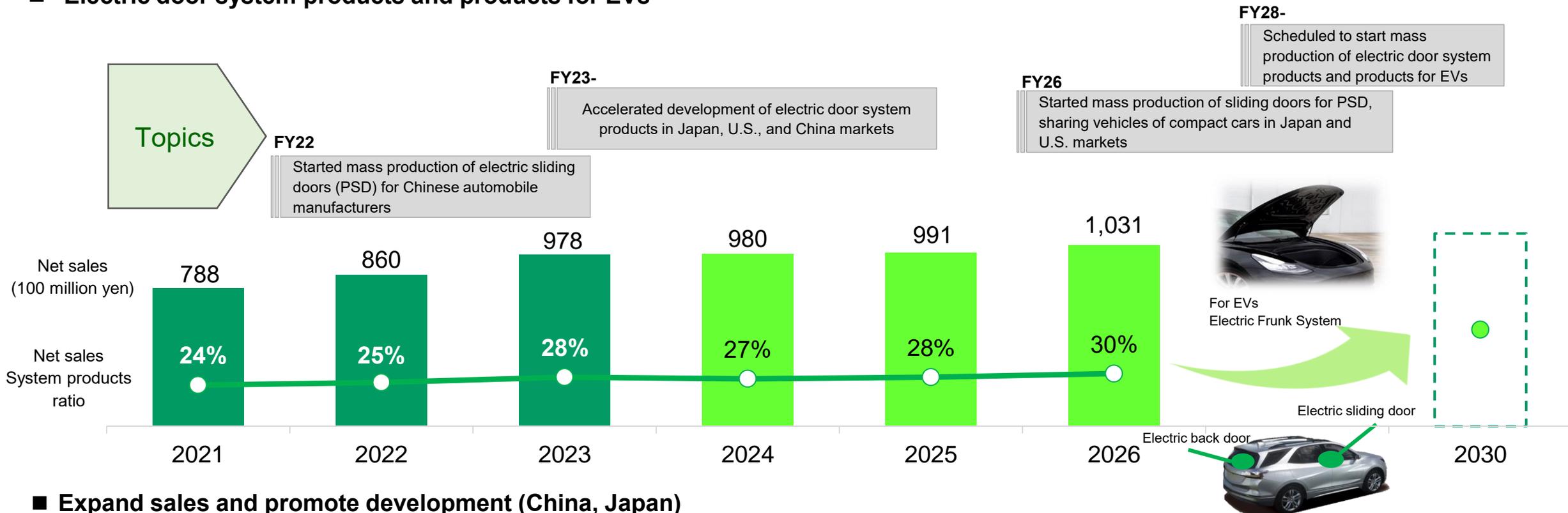
We promote the well-being of the world through a spirit of exploration and diverse technologies.



Financial value improvement  
Value Reinforcement/Optimization

Increase the sales composition of high-value-added electric door system products in response to the expansion of electrification and automation of doors

## ■ Electric door system products and products for EVs



## ■ Expand sales and promote development (China, Japan)

- China: Increased development staff to respond to product expansion\* for Chinese automobile manufacturers \*Scheduled to start mass production of new product (door lock) (FY2025)
- Japan: Continuously strengthen corporate units structure (development/sales) to expand sales and promote development of electric door system products



# Appendix



## Performance Trends (2019-2024)

	2019-2021 Mid-Term Plan			2022-2024 Mid-Term Plan			22-24 MTP FY2022	22-24 MTP FY2024
	FY2019 Results	FY2020 Results	FY2021 Results	FY2022 Results	FY2023 Results	FY2024 Forecast		
<b>Net sales</b>	473.1 billion yen	522.9 billion yen	633.3 billion yen	652.0 billion yen	646.7 billion yen	640.0 billion yen	725.0 billion yen	725.0 billion yen
<b>Ordinary income</b>	9.3 billion yen	51.3 billion yen	66.0 billion yen	19.9 billion yen	44.5 billion yen	35.0 billion yen	40.0 billion yen	60.0 billion yen
<b>Real income</b>	20.8 billion yen	38.6 billion yen	57.6 billion yen	26.7 billion yen	45.1 billion yen	30.7 billion yen	41.4 billion yen	62.0 billion yen
<b>Net income attributable to owners of parent</b>	1.6 billion yen	44.8 billion yen	52.1 billion yen	8.5 billion yen	26.0 billion yen	22.0 billion yen	29.0 billion yen	44.0 billion yen
<b>Free cash flow</b>	1.3 billion yen	11.2 billion yen	35.1 billion yen	11.4 billion yen	40.4 billion yen	10.0 billion yen	15.0 billion yen	*(85.0 billion yen)
<b>Capital Investment</b>	34.0 billion yen	28.2 billion yen	27.5 billion yen	32.5 billion yen	32.0 billion yen	38.0 billion yen	46.0 billion yen	*(117 billion yen)
<b>ROE</b>	0.9%	24.6%	23.8%	3.5%	9.8%	7.7%	11.4%	14.0%
<b>Equity ratio</b>	30.7%	33.4%	37.6%	40.1%	43.5%	44.3%	41.0%	50.0%
<b>Net D/E ratio</b>	1.22	1.09	0.82	0.76	0.60	0.57	0.71	0.42
(Assumption)								
<b>Zinc price (\$/t)</b>	2,405	2,420	3,254	3,332	2,479	2,700	3,700	3,000
<b>Exchange rate (Yen/\$US)</b>	108.8	106.1	112.4	135.5	144.6	145.0	120.0	120.0

\*Figures in parentheses are three-year totals



## Caution Concerning Forward-looking Statements

Statements contained in these materials regarding forecasts of future events are qualified by various risks, both existing and unknown, and uncertainties, which may have a material impact on the actual business conditions and operational activities. Consequently, please be aware that actual performance may differ substantially from forecasts and business plans indicated herein because of various unforeseeable factors.

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Regarding latent risks which might impact forecast results and other uncertainties, some items are included in the “Business and Other Risks” section of our financial statements or our website. However, please recognize that these are just a summary rather than a comprehensive list of all possible items relating to latent risks and uncertainties.

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