

JX Nippon Mining & Metals Group Medium-Term Management Plan for FY2023 - 2025

Presentation Materials

May 11, 2023

 **JX Nippon Mining & Metals**

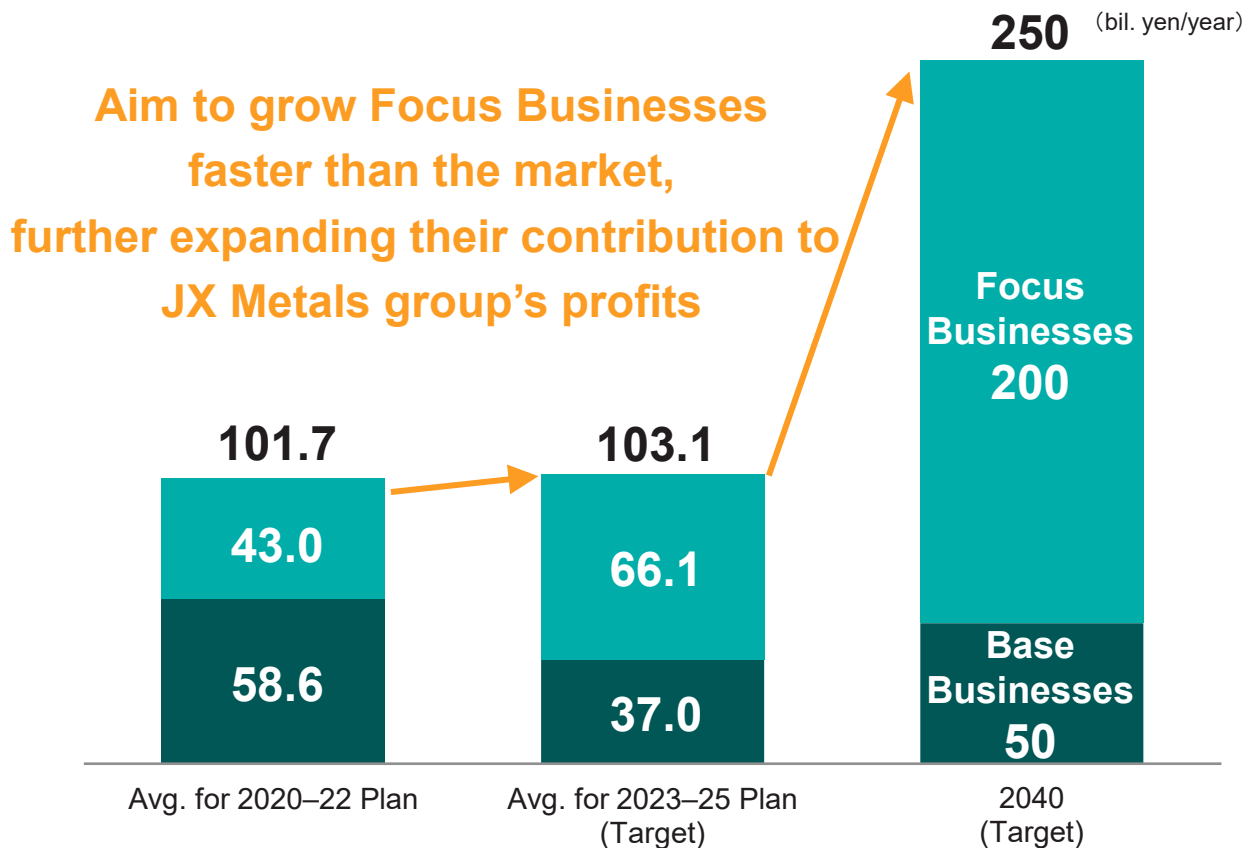
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1. Business Portfolio Targeted by LT Vision

JX aims to achieve enhanced profitability and capital efficiency backed by high-margin and high-growth Focus Businesses that drive further growth

《 Operating Income Growth towards 2040 》



Note: Common expenses are allocated to the two businesses in proportion to their operating income.

Focus Businesses

- Aiming to be a top global player in niche areas through the supply of advanced materials and new business developments

Semiconductor materials

- Increase sales by capturing trends in markets and customer needs
- Expand our business into new adjacent fields within semiconductor related industries

ICT materials

- Capture demand for advanced interconnection devices
- Provide distinctive products for post-smartphone devices

Create the third pillar of profits that drives further growth

Supply raw materials/
Provide management resources

Base Businesses

Metals & Recycling

- Long-standing raw materials supply to Focus Businesses
- Establish operations corresponding to ESG agenda

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2. Previous Plan: Key Principles and Key Strategies

Key Principles

Build fundamentals to transform into a technology-based company and achieve LT Vision by promoting greater autonomy, agility and independence



Key Strategies

Focus Businesses

Accelerate growth by capturing demands for communication infrastructure and devices in a data-driven society

Technology development

Develop fundamentals to create new businesses as a technology-based corporation

Base Businesses

Boost profitability of Caserones and adapt to changes in the market

Organization and HR (corporate culture)

Cultivate enhanced corporate culture and workplace with open-mindedness, and develop human resources to adapt diversity

SDGs

Contribute to develop sustainable society and reduce CO₂ emissions through advanced materials backed by technological innovation and talent development

2. Previous Plan: Past Implemented Measures

	strategic investment and technology development	business portfolio restructuring	reform policy measures and realization of the SDGs
	<p>Focus Businesses</p> <p>Expand production capacity to meet growing demand Investment to create a portfolio centered on the Focus Businesses</p>	<p>Develop technology-based businesses, ESG initiatives, etc.</p> <p>Build fundamentals to develop next pillar of profits Promote sustainable copper projects for our ESG management</p>	<p>Base Businesses</p> <p>Stabilize profitability and minimize volatility by reshaping asset portfolio Support transformation to center on Focus Businesses</p>
FY 2020	<p>HQ relocation (to introduce dynamic management and develop personnel oriented to added value)</p> <p>Capacity expansion of semiconductor sputtering target</p>	<p>Collaboration with Novel Crystal Technology</p> <p>Establishment of thinktank subsidiary</p>	<p>Restructuring of copper business</p> <p>Investment in scrap treatment capacity</p>
FY 2021	<p>Capacity expansion of treated rolled copper foil</p>	<p>Establishment of Promotion Offices</p> <p>Establishment of Li-ion battery recycling subsidiaries</p> <p>Collaboration with a national research laboratory (AIST)</p>	<p>Sale of P.T. Smelting</p>
FY 2022	<p>Implementation of sustainable copper</p> <p>Implementation of new Hitachinaka plant</p> <p>Implementation of new North America plant</p> <p>TOB Announcement of Tatsuta Electric Wire and Cable (Investment in Mibra mine)</p> <p>Acquisition of Maruwn</p>	<p>Investment in NanoWired</p> <p>Accredited to the Copper Mark</p>	<p>Acquisition of eCycle Solutions</p> <p>Sale of LS-Nikko Copper</p> <p>Investment in Mibra mine</p> <p>Partial sale of Caserones mining interests</p>

1 Business Portfolio Targeted by Long-Term Vision (“LT Vision”)

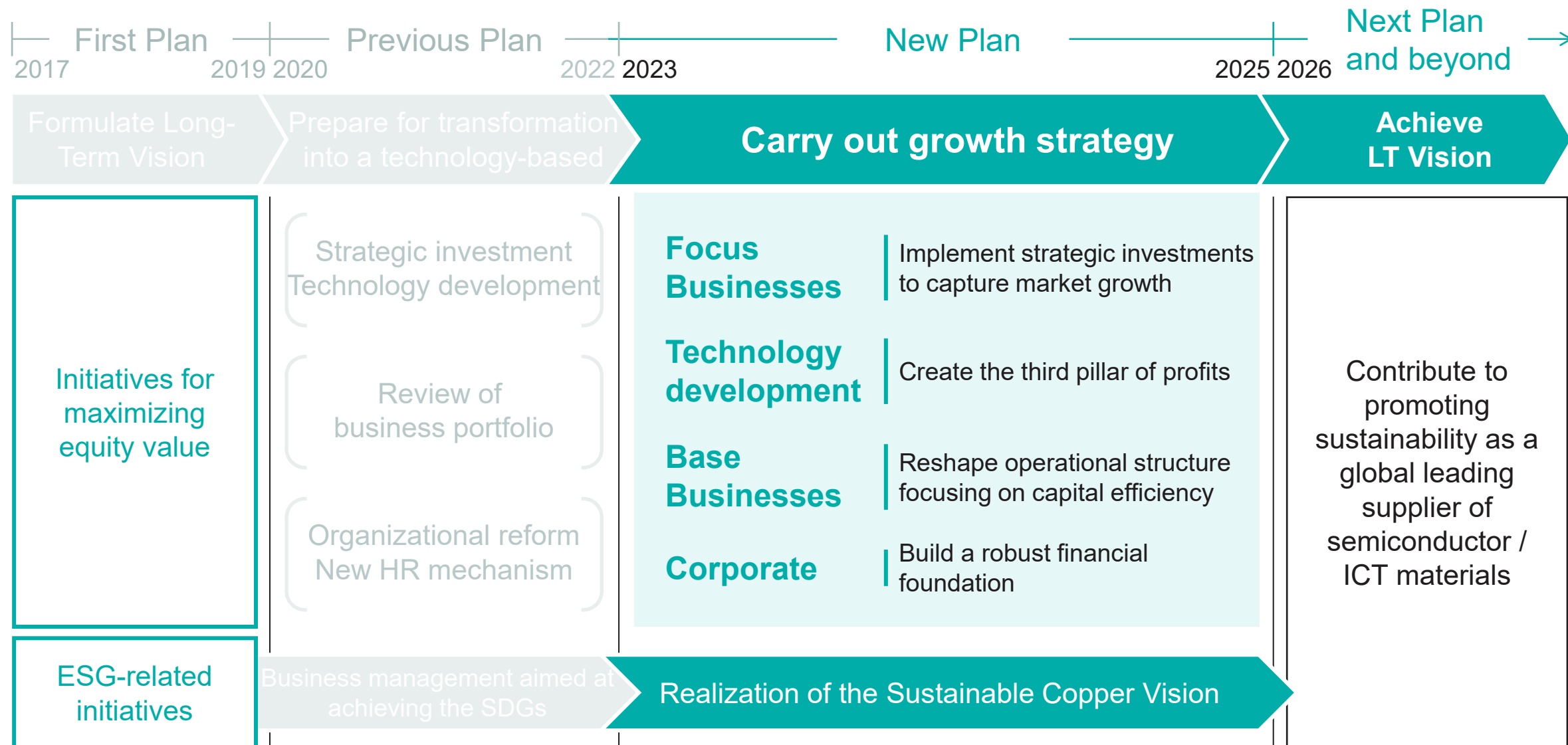
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3. New Plan: Where We Are

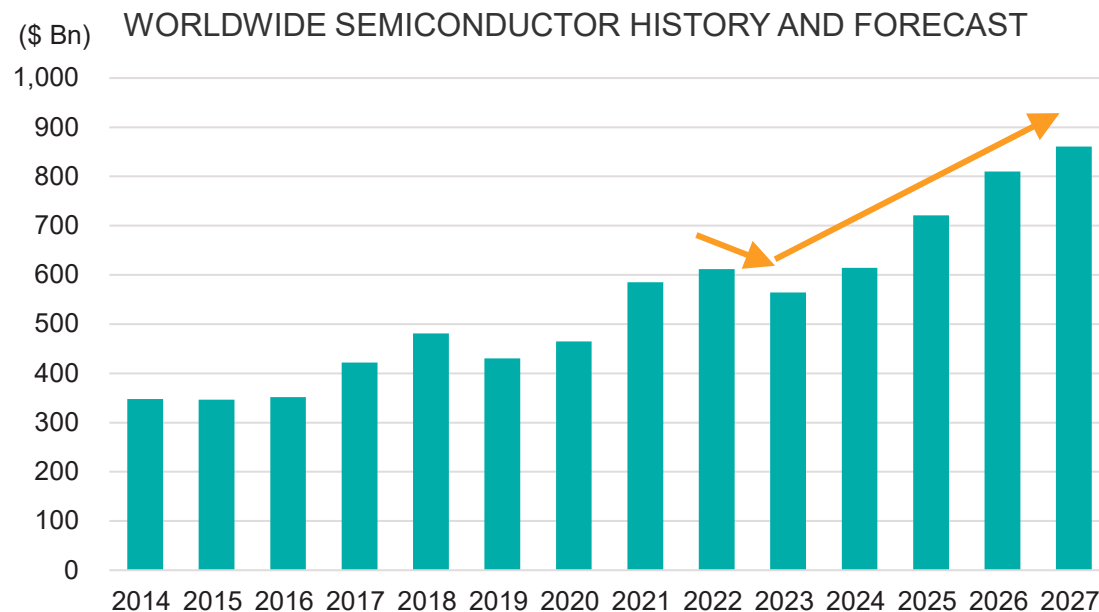


3. New Plan: Market Outlook for Focus Businesses

Demands, which are expected to recover from late 2023, in data center, communications, mobility (EV and ADAS), and renewable energy spaces should bring high growth in the medium to long term

《 Semiconductor market outlook (estimates) 》

- Recovery from second half of 2023 (2022–25 CAGR: 5.6%)
- New plants for semiconductor devices start operation in 2023 and 2024, expanding supply capacity



Source :TechInsights Manufacturing Analysis Inc.

Smartphones

- Current 5G smartphones are not expected to lead to market expansion or replacement due to limited performance improvements and declining economy.
- Demand to replace 4G models has accumulated and is expected to emerge in 2024 and 2025 with economic recovery.

PCs and servers

- After rapid increase of remote work during the pandemic, PC demand is expected to be weak until 2023; the end of user-support for Windows 10 in 2025 should boost replacement.
- Server demand is in a growth trend due to digitalization; poor performance of major cloud service providers may hinder demand temporarily.

Automobiles

- Semiconductor shortages are expected to end in 2023 and automobile production may return to normal, but growth will be held back by inflation and high interest rates, with full recovery expected from 2024.
- EV trend is likely to continue, and EVs are expected to be comparable in cost to combustion engine vehicles in 2025.

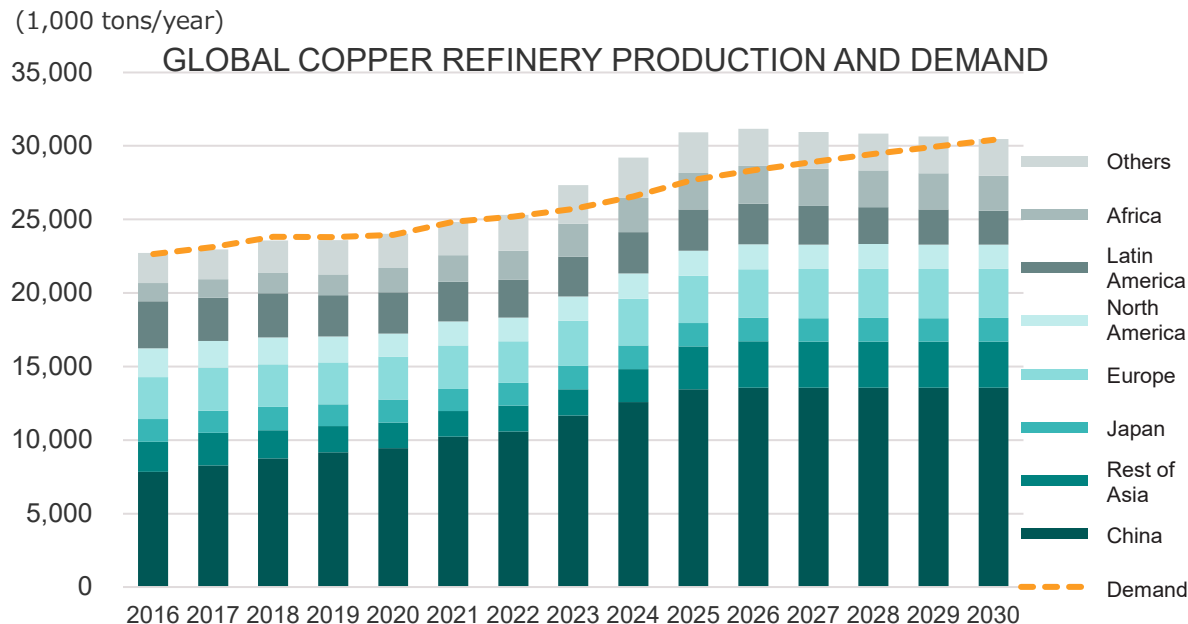
3. New Plan: Market Outlook for Base Businesses

The building of new smelters in Asia and restrictions on cross-border trade of e-waste make raw materials' procurement more competitive

Higher price of copper increases working capital at smelters

《 Refined copper market outlook (estimates) 》

- Demand is growing in response to decarbonization trends (2022 - 25 CAGR: 3.2%)
- Supply capacity in Asia is expanding even faster (2022 - 25 CAGR: 9.9%)



Source : Wood Mackenzie "Global copper strategic planning outlook Q1 2023"

Mineral Resources

- Resource nationalism and protectionism are on the rise, as seen in deliberation on the mining royalty bill in Chile.
- The costs of mining are rising with higher energy prices and costs of environmental measures.

Metals

- While copper price is being sustained by its steady demand, there is downward pressure from uncertainties in the global economy and expanding supply capacity; the price is expected to trend lower than current levels.*
- Building new smelters in Asia is resulting in tight supply-demand of copper concentrates; the smelting margins are lowering and the market for refined copper is heating up especially in Asia.

Recycling

- Despite the increase in the amount of e-scrap, competition is intensifying with the surge in demand for products made from recycled materials.
- There is a strong possibility that cross-border movement of e-waste will be restricted due to amendments in rules aimed at preventing illegal export to developing countries.

*Copper price assumption (¢/lb) 2023–25: 360

3. New Plan: Key Strategies

Aiming to be a leading global supplier of semiconductor/ICT materials by executing strategic investments for Focus Businesses, reshaping operational structure of Base Businesses and creating social value

Focus Businesses

《 Strategic investments to capture market growth 》

- Ensure in-progress projects achieve successful ramp-ups
- Investment into new plants in Hitachinaka and North America

1 Semiconductor materials

- Capture high demand for semiconductor sputtering targets
- Expand into new areas adjacent to existing fields

2 ICT materials

- Capture strong demand for advanced interconnection infrastructures and devices
- Entry to automotive application markets backed by EV trends

Technology development and ESG initiatives

《 Business creation to fulfill social responsibility and achieve sustainable growth 》

- Create next pillar of profits through new business and technology developments
- Start realizing the Sustainable Copper Vision

Base Businesses (Metals & Recycling)

《 Reshaping the operational structure by focusing on capital efficiency 》

- Promote transformation to an optimal portfolio not dependent on scale
- Reinforce supply chain (including minor metals) to support Focus Businesses

- Build a robust financial foundation to be a global leading supplier of semiconductor/ICT materials
- Strengthen corporate governance structure required for a listed company

3. New Plan: Strategy for Focus Businesses

Accelerate strategic investments to capture high market growth

Future demand trends for main products

■ Sputtering target for semiconductors

In addition to an incremental volume of semiconductor products, the amount used per each semiconductor device is expected to increase due to 3D stacking

■ Treated rolled copper foil

The amount used in a smartphone is expected to increase as replacement for electrolytic copper foil
Demand for applications such as wearable devices and EVs also grows

Key Initiatives

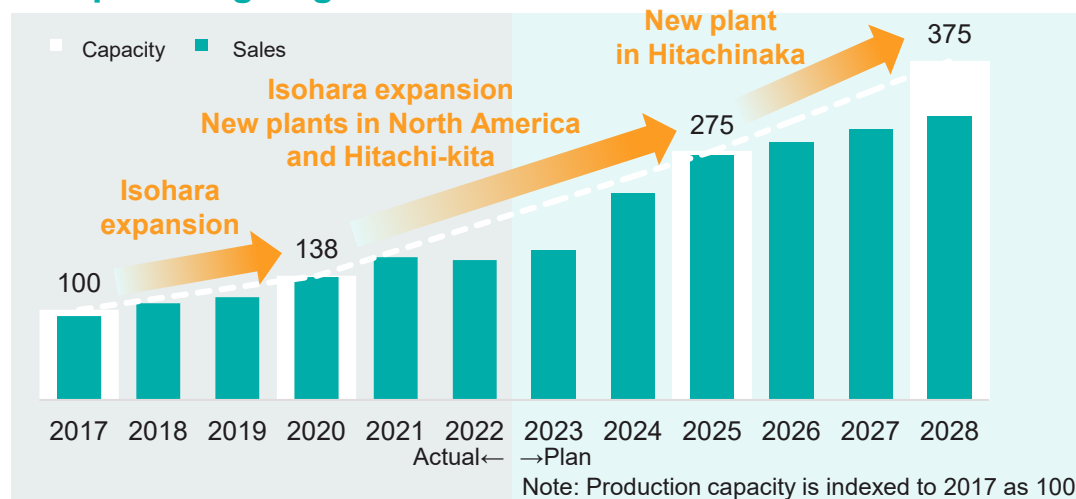
■ Expansion of production capacity

- Ensure in-progress projects achieve successful ramp-ups
- Carry out investments in both new Hitachinaka and North American plants

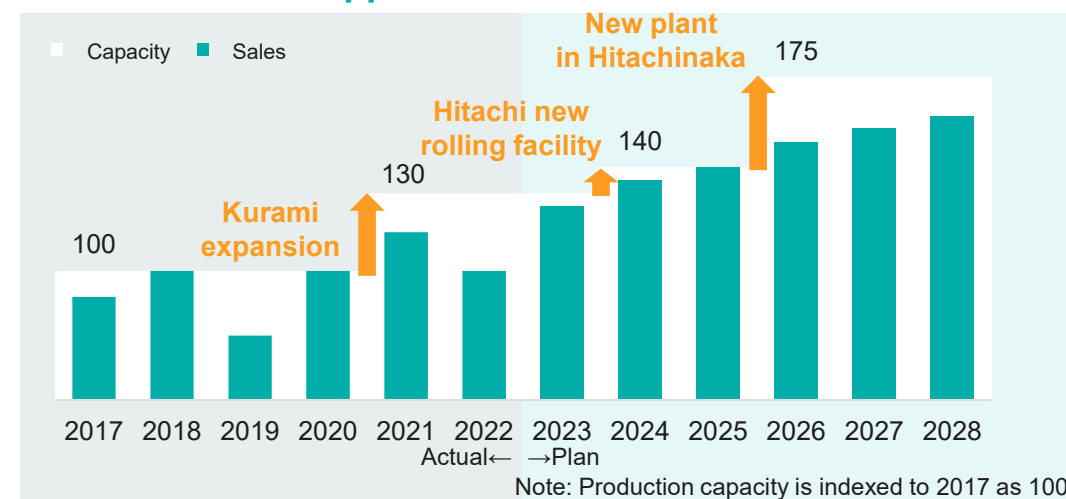
■ Support development and mass production in response to customer needs

- Collect feedback for new applications in a timely manner, and develop new products ahead of competitors

《 Sputtering target for semiconductors 》



《 Treated rolled copper foil 》



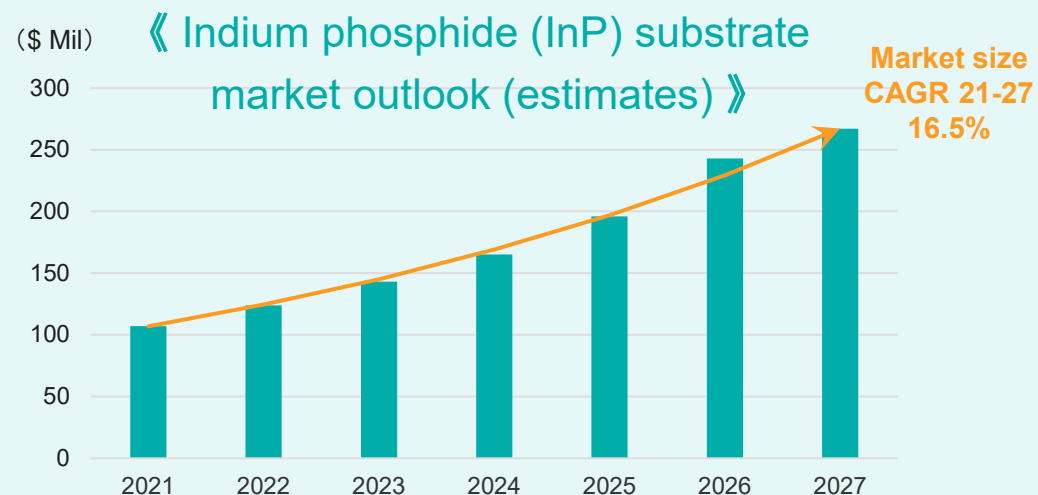
3. New Plan: Strategy for Focus Businesses

New business development for the third pillar of profits

Focus areas and products

- **Compound semiconductors**
- **High-functionality copper alloys**
- **Metal powders**
- **Chlorides for CVD**

Crystal materials business



(Source) Market size: "YOLE Intelligence:InP 2022 Market and Technology Report"

Demand trends in the crystal materials business

- Demand for InP substrates for light emitting and receiving devices continues to grow with the increase in data centers and mobile communications.
- New applications for InP substrates are also expanding, such as near infrared sensors in smartphones and wearable devices.
- Larger sized CdZnTe-based infrared image sensors are used in the aerospace field.
- CdZnTe-based semiconductor detectors are used to realize low-exposure, high-resolution radiation detection in industrial and medical care applications.

Key Initiatives

- **Establish a new business division for crystal materials business** (Targeted in FY2025)
- **Expand InP substrate production capacity**
 - Expansion at Isohara and new plant construction
- CdZnTe substrates with larger size and higher quality
- Search for new applications such as defense and medical areas for existing products and expansion into related businesses
- Research and development new products of crystal material

3. New Plan: Strategy for Base Businesses

Establish an operational foundation to support the growth of Focus Businesses

Pursuing the optimal operational structure not dependent on scale, and improving profitability

Copper

Reshaping the operational structure focusing on capital efficiency

- Improve financial stability by increasing profitability and reducing working capital
- Transform to an optimal production scale and business structure

Promote Green Hybrid Smelting

- Expand capacity for receiving and processing recycled materials

Monetize recycling business

- Increase collection volume by diversifying procurement routes and materials

Minor metals

Establish supply chains for tantalum, titanium, and other minor metals

- Search for new mines to invest

Establish supply chains to recycle tantalum, titanium, and other minor metals

- Boost collection of tantalum scrap



3. New Plan: Strategy for Production Engineering and Technology Development

Production Engineering Share advanced production technologies and optimize production processes to improve cash flow

Priority initiative

- Group-wide sharing of advanced production technologies

Specific examples

- Analyzing data
- Utilizing simulation and AI

Goal

- Optimizing production processes

Technology development Accelerate development of the technologies in the areas of focus

Areas of Focus

Keywords

Initiatives

Next-generation semiconductor materials

Enhance our presence as CVD raw materials supplier

Expand CVD raw material lineup and select M&A/alliance candidates

Heat management materials

Solutions with multiple heat sink parts

Develop new applications in semiconductors (power, logic)

Crystal and photonics materials

Reorganization to an independent division

Enhance our presence in DC market and develop new applications in medical, aerospace, and other areas

Life sciences

Paths to enter the market

Search for themes applying core technologies in the life sciences field and collaborate with group companies

ESG-related technologies and materials

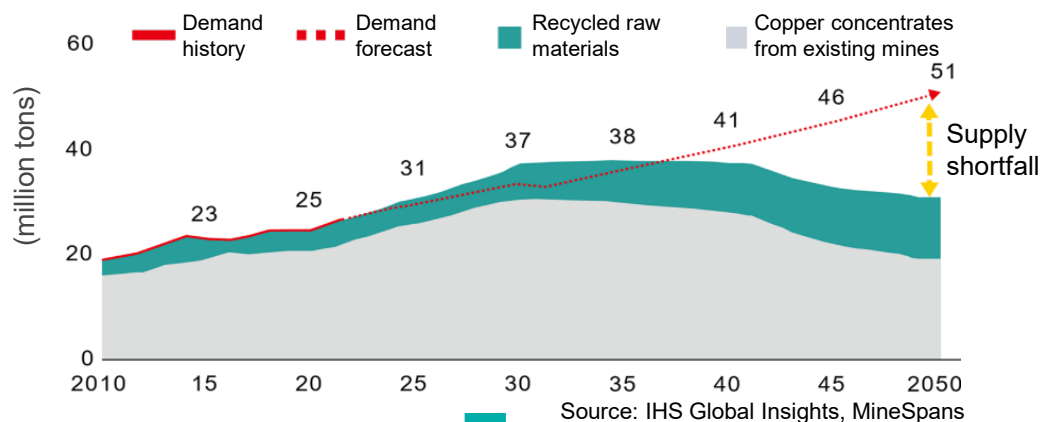
Recycling, CO₂ reduction, hydrogen

Develop catalysts to produce hydrogen
Promote Li-ion battery recycling business

3. New Plan: ESG Initiatives (Sustainable Copper Vision)

Making use of both copper concentrates and scrap is indispensable to meet the incremental demand in copper due to growing decarbonization infrastructure and EVs

Future Demand Outlook for Copper



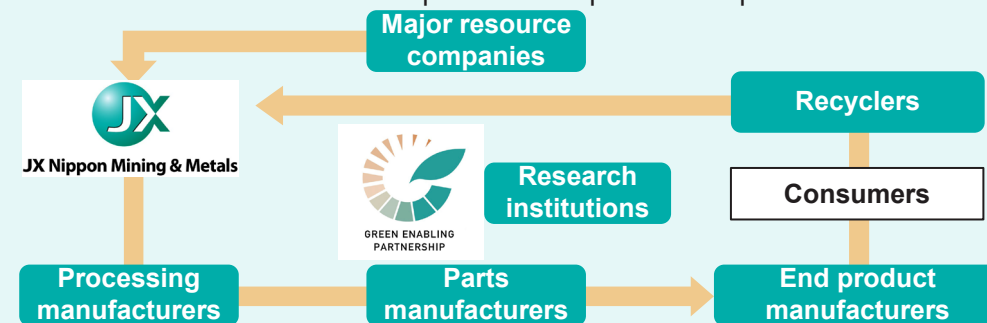
Two missions in parallel

- Offer a stable supply system to support growing demand
- Conduct ESG-oriented production and supply (decarbonization, circular economy, etc.)

To achieve our two missions, we have presented to stakeholders our **Sustainable Copper Vision**: A realistic sustainable supply of copper.

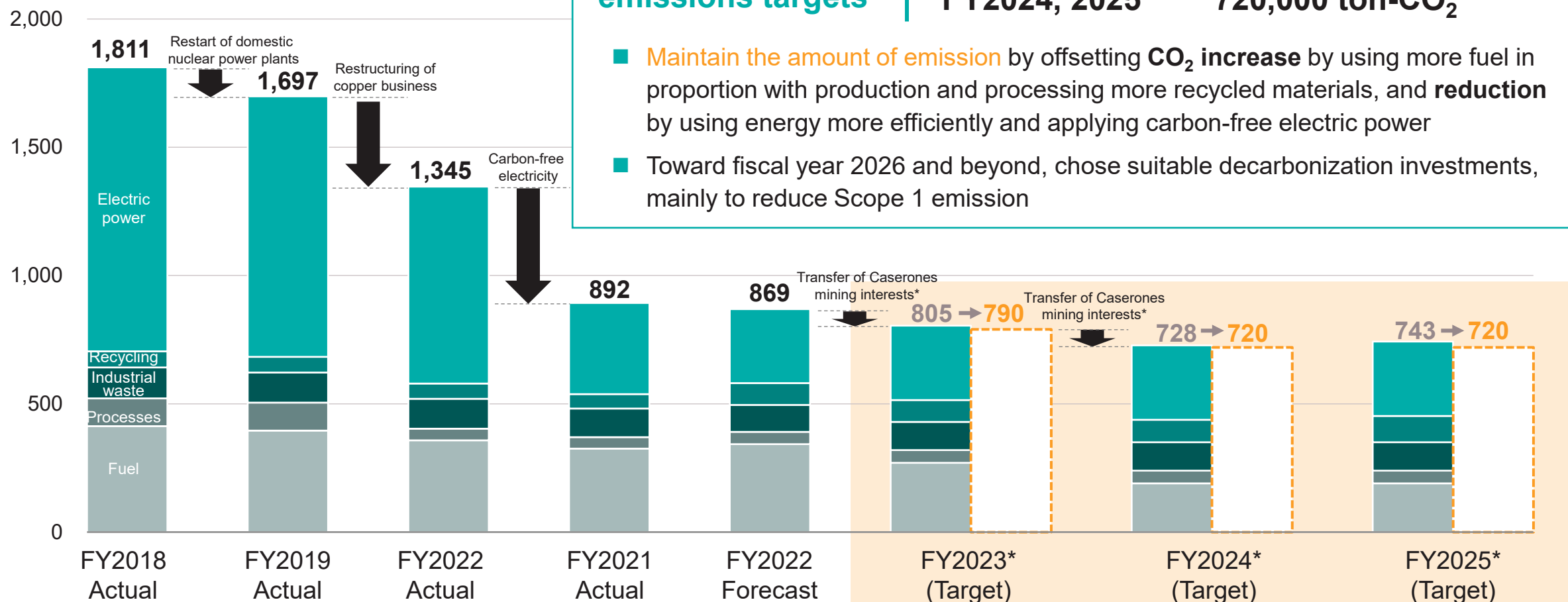
Four policy measures to achieve the vision

- Reduce CFP (Carbon Footprint of Products)**
 - Refined copper CFP by a third-party
 - CO₂ reduction at smelters and in transportation of copper concentrates
- Increase recycling rate**
 - Promote Green Hybrid Smelting process (50% recycled raw materials by 2040)
 - Establish a framework to work closely with recyclers
- Promote responsible procurement and other measures**
 - Copper Mark acquisition (In Dec. 2022 by the Saganoseki Smelter & Refinery and Hitachi Works, the first for domestic smelters in Japan)
- Form Green Enabling Partnership**
 - Increase awareness of the vision and expand collaborating companies
 - Achieve economically viable and transparent copper resource recycling and increased scrap collecting by cooperation with partner companies



3. New Plan: ESG Initiatives (Decarbonization Plan)

(thousand tons of CO₂)



Our total emissions targets

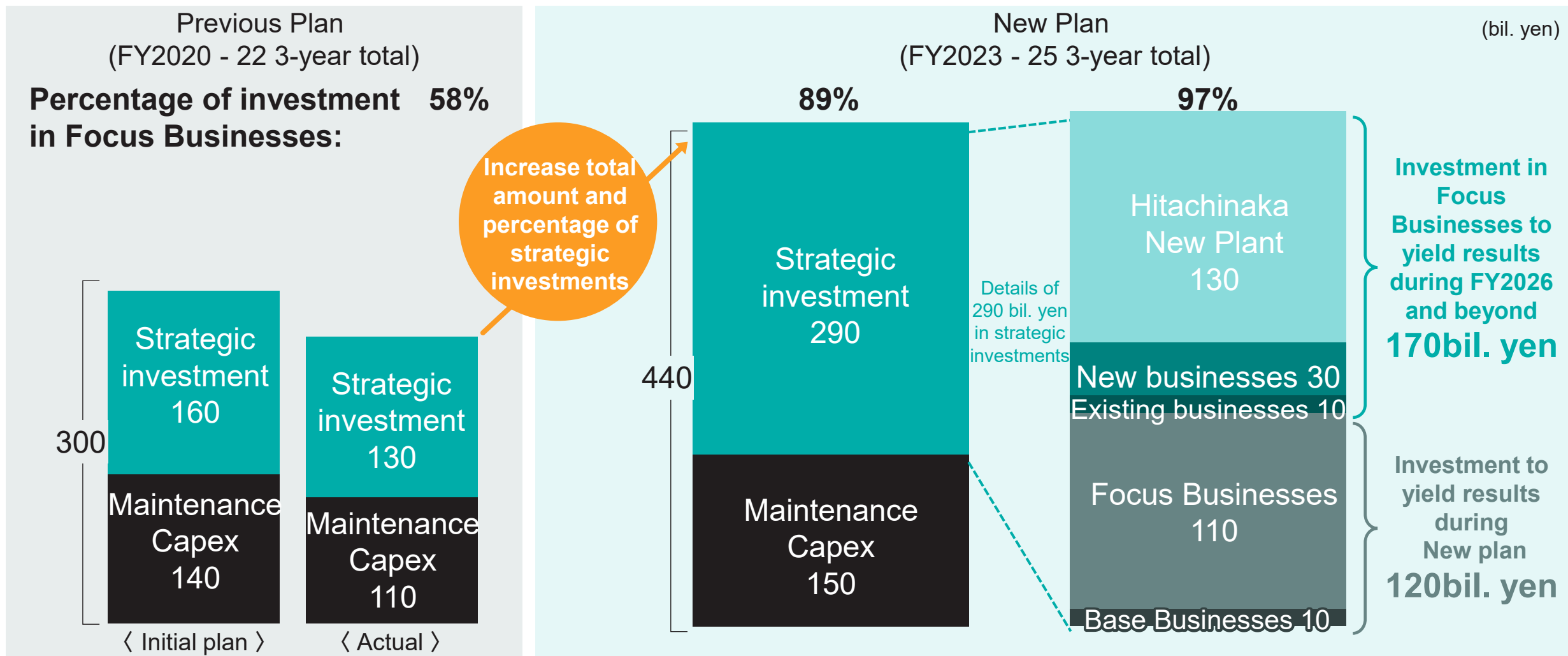
FY2023 790,000 ton-CO₂
FY2024, 2025 720,000 ton-CO₂

- **Maintain the amount of emission** by offsetting **CO₂ increase** by using more fuel in proportion with production and processing more recycled materials, and **reduction** by using energy more efficiently and applying carbon-free electric power
- Toward fiscal year 2026 and beyond, chose suitable decarbonization investments, mainly to reduce Scope 1 emission

Caserones is excluded from FY2023 starting July 2023 and from full-year forecasts for FY2024 and after.

3. New Plan: Planned Capex

Carry out strategic investments to capture incremental demand in Focus Businesses

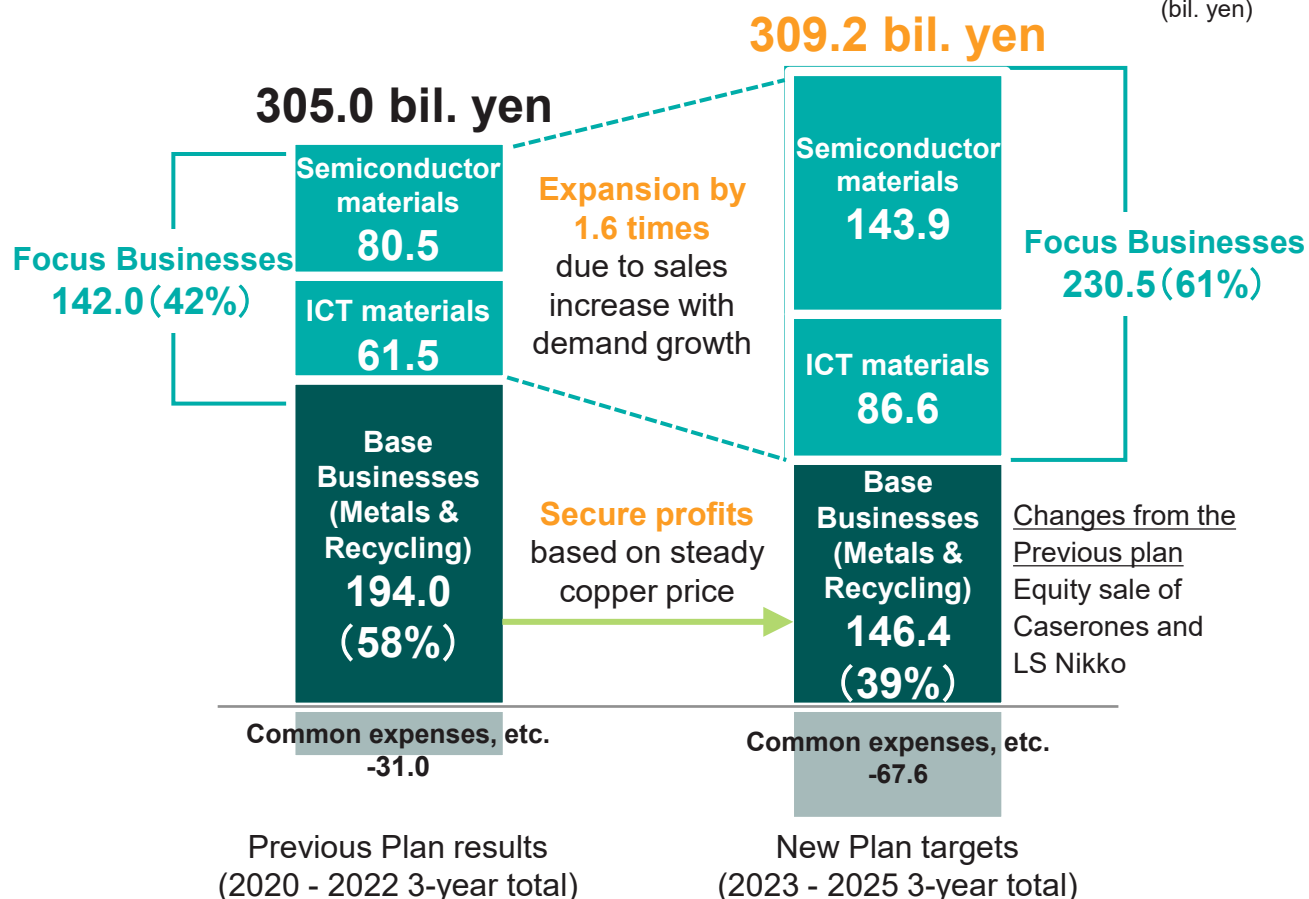


3. New Plan: Business Plan

Aim to achieve targets and pursue further upside by carrying out business strategy

《 3-year total operating income 》

IFRS standard (excluding inventory valuation factor)
(bil. yen)



Business Plan

Aim for 3-year total operating income during the New Plan to exceed the Previous Plan, by capturing the anticipated strong recovery of demands, even though Electronics market has declined since last year*

- Semiconductor materials**: Sales growth by expanded production capacity, strengthened supply chain, and differentiated products
- ICT materials**: Building production capacity to meet demand growth
Sales promotion focusing on distinctive products
- Metals & Recycling**: Pursuing capital efficiency rather than scale
Incremental profit by expanding recycling business

* FY2023 operating income outlook in metals segment: 89.0 bil. yen (announced May 11)

Note: See p. 21 for the copper price and exchange rate assumptions.

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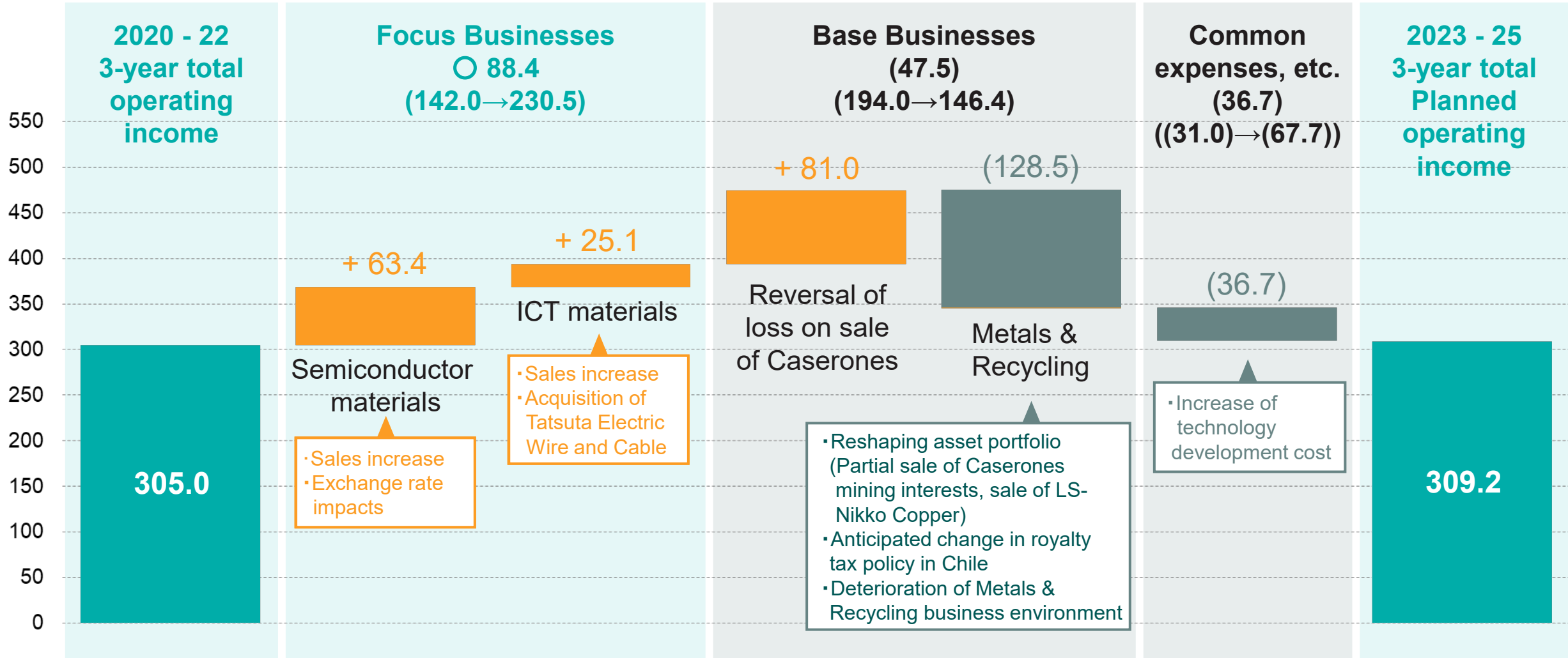
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4. Previous Plan vs. New Plan (3-year total)

(bil. yen)



4. Financials and Assumptions

Financials (Operating Income)

(bil. yen)

	FY2022 Actual	FY2023 Budget	FY2024 Targets	FY2025 Targets	FY2023 - 25 Total
Focus Businesses	56.4	48.1	79.5	1,02.9	230.5
Semiconductor materials	34.6	29.5	49.1	65.3	143.9
ICT materials	21.8	18.6	30.4	37.6	86.6
Base Businesses (Metals & Recycling)	18.7	59.4	40.1	47.0	146.4
Common expenses	(6.4)	(18.5)	(15.1)	(34.0)	(67.6)
Total operating income (loss)	68.7	89.0	104.5	115.8	309.2

Key Assumptions

		FY2022	FY2023 (Assumption)		FY2024 (Assumption)		FY2025 (Assumption)		
			Vs. FY2022	Sensitivity*(bil. yen)		Vs. FY2022		Vs. FY2022	
Exchange rate	yen/\$	134.9	130	(-)4.9	1.4 (±1yen)	130	(-)4.9	130	(-)4.9
Copper price	¢/lb	386	360	(-)26	3.3 (±10¢)	360	(-)26	360	(-)26

*impact of variation on operating income

(Excluding exchange gains/losses related to sales of Caserones)

Cautionary Note on Forward-Looking Statements

The purpose of this material is to provide information, etc. related to our company in the medium-term management plan of which regularly announced by our parent company, ENEOS Holdings, Inc. (TSE Prime Market / 5020)

The data and future projections and other forward-looking information indicated in these materials reflect judgments and various assumptions based on information available at the time of this presentation. There are many risk factors and uncertainties inherent in such forward-looking statements, and there is no guarantee of achieving the forecasts or of future performance expressed or implied by such forward-looking statements.

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