

JX Nippon Mining & Metals Group Medium-Term Management Plan for Fiscal 2020 to 2022 Progress Briefing

May 28, 2021



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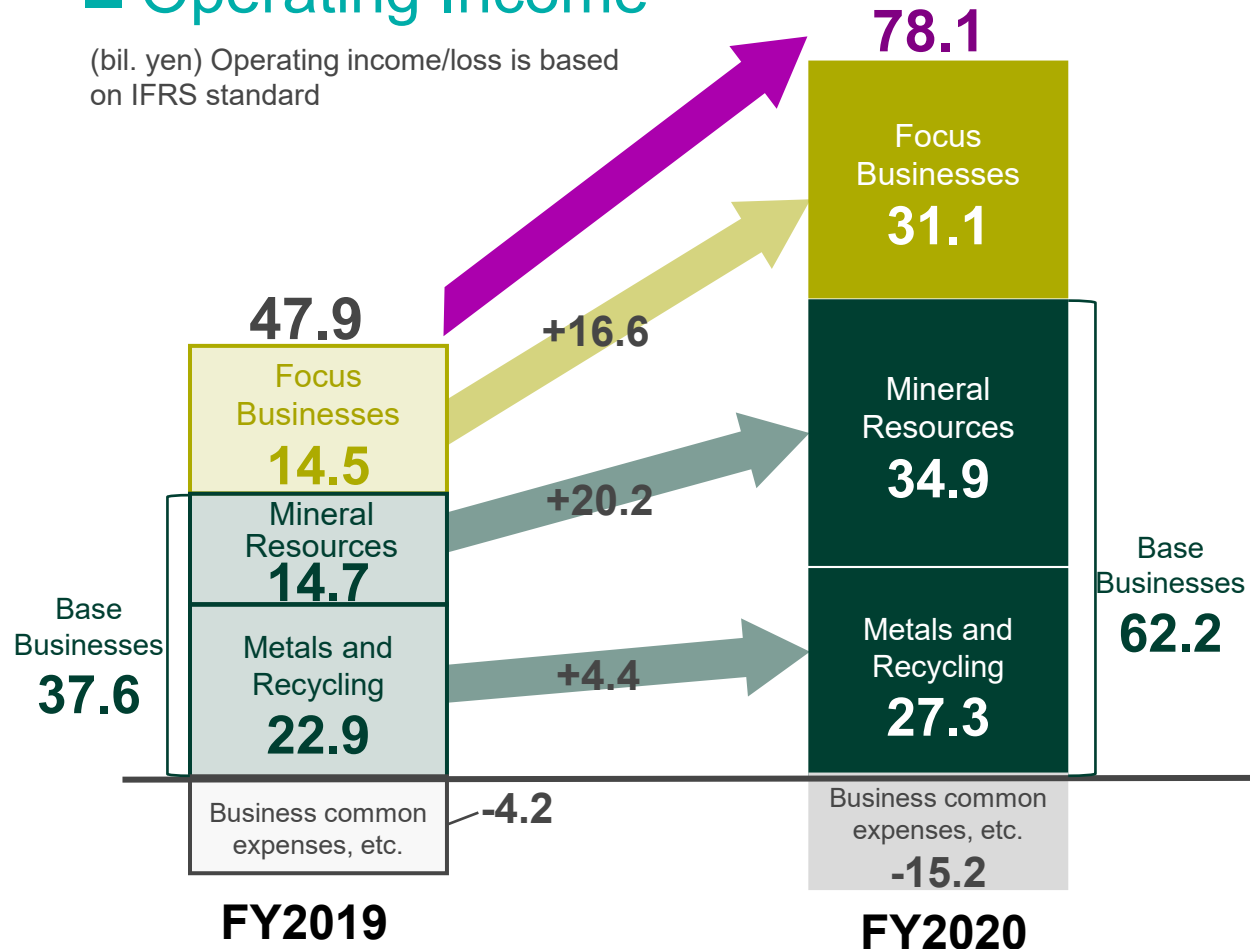
Reference Data

1. Medium-Term Management Plan Progress As Seen in Numerical Data

1-1. Performance in Fiscal 2020

■ Operating Income

(bil. yen) Operating income/loss is based on IFRS standard



Year-on-year rise in income from higher copper prices along with growth of focus businesses

Focus Businesses

Rise in income from increased sales volume in Functional Materials and Thin Film Materials with data communications demand growth

Base Businesses

Mineral Resources: Despite lower production at Caserones Copper Mine impacted by pandemic, rising copper prices^(*1) led to increased income^(*2)
Metals and Recycling: Despite worsening of copper ore trading conditions, rise in income mainly from higher precious metals prices

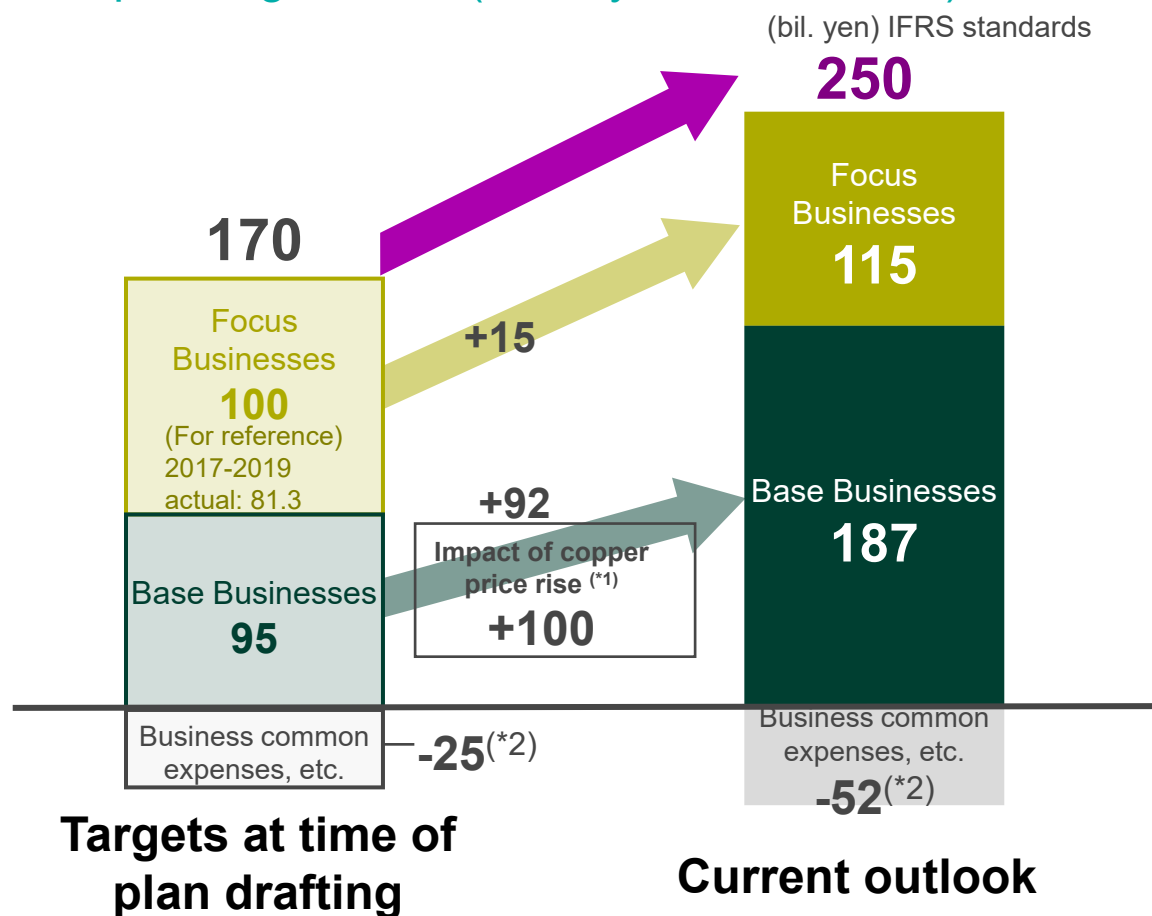
(*1) Average price in 2019 : 266¢/lb → Average price in 2020: 312¢/lb

(*2) Includes one-time income and loss such as Caserones Copper Mine impairment loss of -69.4 and income from debt cancelation of +63.5

1-2. Medium-Term Management Plan Progress

Medium-Term Management Plan Progress
As Seen in Numerical Data

■ Operating income (three-year cumulative)



Both focus and base businesses forecast to see higher income than at the time the plan was drafted

Focus Businesses

Thanks to increased sales supported by dynamic capacity expansion to meet demand growth, rise of 15 billion yen from targets at time plan was drafted

Base Businesses

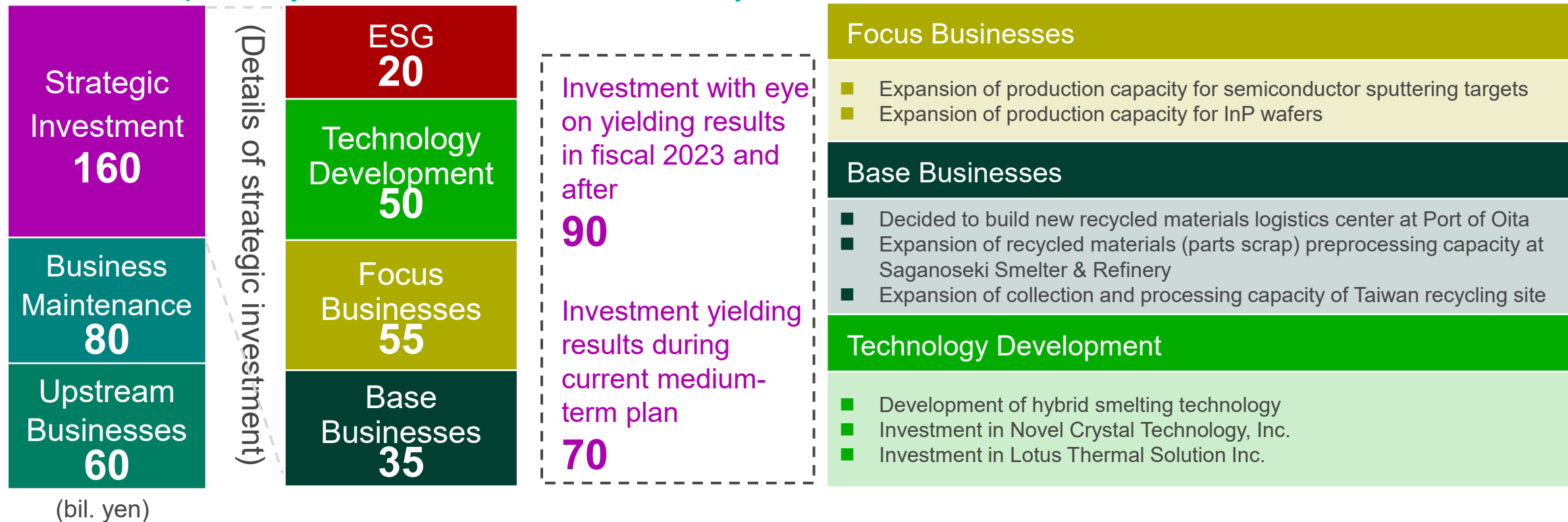
Excluding the impacts of copper price rises and the pandemic, income expected to rise above forecasts at time of plan drafting

(*1) Assumptions at time of plan drafting (¢/lb) 2020: 250, 2021: 270, 2022: 270
→ Current assumptions (¢/lb) 2020: 312, 2021: 340, 2022: 320 (2020 is actual)

(*2) Business common expenses, etc. At time of plan drafting -25 bil. → current outlook -52 bil.
(one-time expenditures, etc.)

1-3. Investment Strategy

- **No change from three-year total of 300 bil. yen** at time of plan drafting
- To meet increased demand for thin film materials from data communications demand growth, **move up planned capacity expansion**
- To boost efforts as an ESG leading company in the nonferrous metals industry, **redefine as ESG investment allocation**
- **Investment plan: 3-year cumulative total of 300 bil. yen**
- **Main decided/in-progress investments**



2. Details of Medium-Term Management Plan Progress

2-1. Changes in Business Climate Since Plan Was Drafted

View of business climate when plan was drafted	Focus Businesses	The coming of the data-driven society brings expectations for demand growth in advanced materials
	Base Businesses	As rising costs and worsening of the market environment are foreseen, the business climate will continue to be challenging



Current view of business climate (changes since plan was drafted)	Focus Businesses	<ul style="list-style-type: none"> ■ Semiconductor shortages have emerged due to rapid demand growth and ongoing US-China trade friction, and semiconductor manufacturers have successively announced equipment expansion for advanced production lines. ■ In response to pandemic impact, accelerated advance of data-driven society (demand growth for smart devices, communications infrastructure, power supplies)
	Base Businesses	<ul style="list-style-type: none"> ■ Persistence of the pandemic is deepening the impact on copper mine operations. ■ Due to supply-demand tightness from the decline in mine production, etc., the smelting and refining margin is trending at levels even lower than those when the plan was drafted. ■ Rise in prices of copper and precious metals
	ESG	<ul style="list-style-type: none"> ■ Efforts to tackle climate change are accelerating worldwide <div> Oct. 2020: Japanese Government pledges to achieve carbon neutrality by 2050 Apr. 2021: Japanese Government announces commitment to 46% reduction in greenhouse gases by 2030 </div>

2-2-1. Focus Business Progress: Boosting targets for semiconductor production capacity

- The semiconductor supply shortage is becoming more severe with explosive demand growth
 - The chip shortage is so serious it is forcing automakers to reduce production.
 - **Semiconductor manufacturers** have successively announced investments equivalent to **several trillion yen** in boosting their advanced production lines.
- Sales of sputtering targets for semiconductors
 - The sales volume for the entire three-year plan was **revised upward by around 20%** from the volume when the plan was drafted; but even **those expectations were already exceeded as of April 2021**, and the volume expected to be sold in fiscal 2022 is now being shipped.

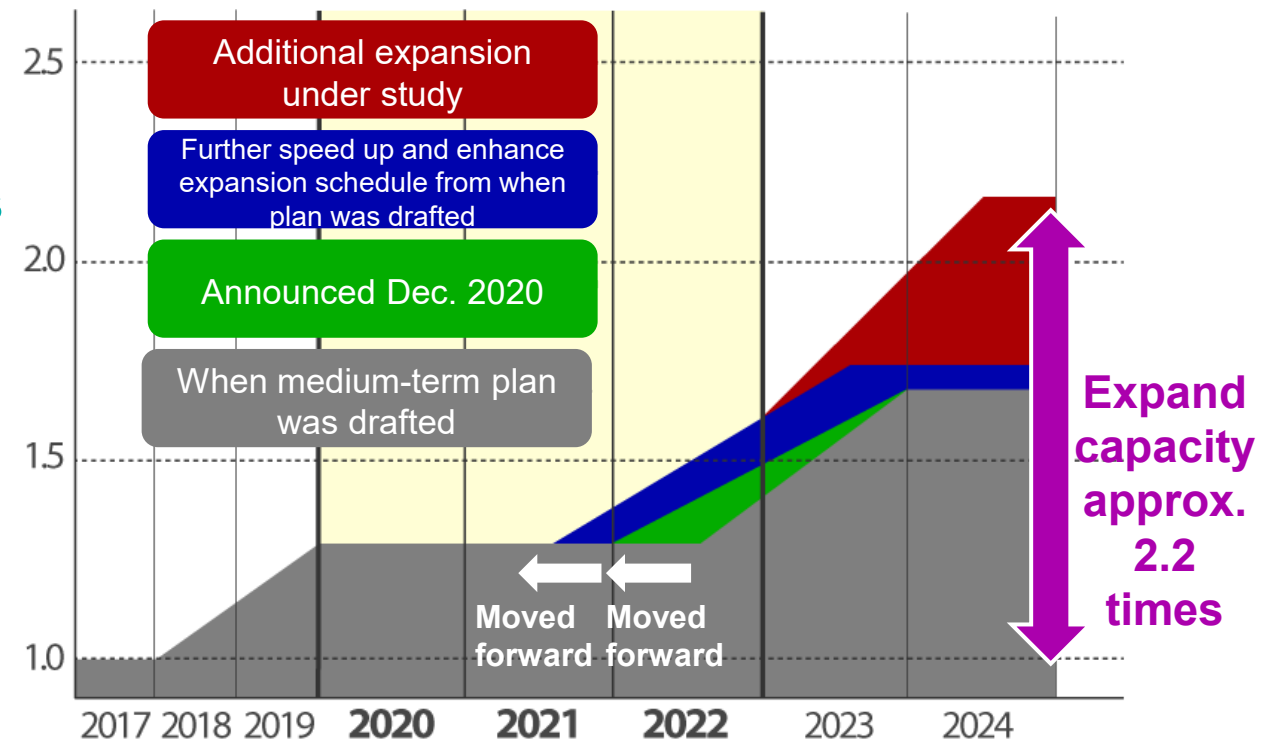


Currently all possible measures are being taken to meet growing demand

- Expansion of production capacity for targets for semiconductor is being **accelerated**


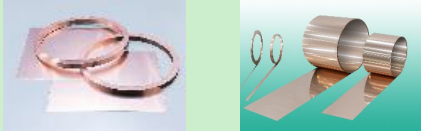


Targets for Semiconductors production capacity (illustration)

*Indexed to FY2017 capacity as 1



2-2-2. Focus Business Progress: Keeping up with the accelerating pace toward a data-driven society

- For each product, the **markets are growing in line with or exceeding expectations**
- Production capacity is being increased dynamically in parallel with BCP measures

Treated rolled copper foil 	High-functionality copper alloy strips 	InP wafers 	Tantalum powder (for target) 
Application examples	Application examples	Application examples	Application examples
Flexible printed circuit boards	Connectors, etc.	Optical communications modules	Semiconductors
FY2020 actual	FY2020 actual	FY2020 actual	
<ul style="list-style-type: none"> ■ Early startup of equipment added in previous medium-term plan, including at overseas sites 	<ul style="list-style-type: none"> ■ Early startup of equipment added in previous plan 	<ul style="list-style-type: none"> ■ Completed 25% capacity increase over FY2019 (InP wafers) 	
FY2021 planned	FY2021 planned	FY2021 planned	
<ul style="list-style-type: none"> ■ Consideration of further expansion to meet robust demand 	<ul style="list-style-type: none"> ■ Start of commercial operation at Muroran Copper Alloy (scheduled for Sept. 2021) ■ Consideration of further expansion to meet robust demand 	<ul style="list-style-type: none"> ■ Consideration of equipment expansion at Thailand plant (tantalum powder for target) 	

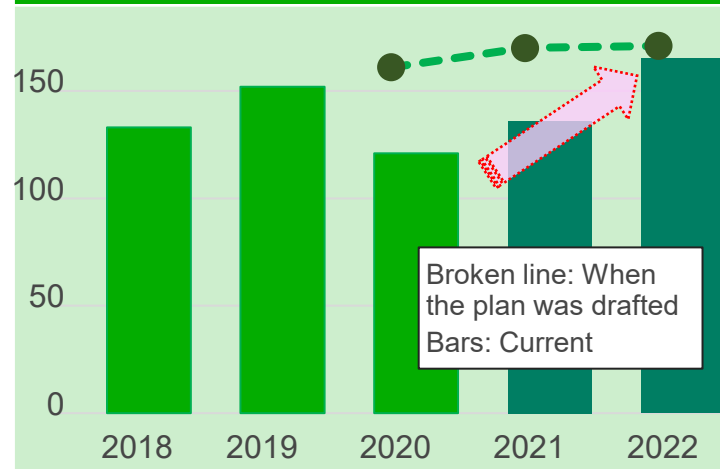
2-3-1. Base Business Progress (Mineral Resources): For early recovery from pandemic

■ Caserones Copper Mine: Changes since the plan was drafted

- All mining rights to Caserones Copper Mine acquired in Feb. 2021 → Contributes to stable procurement of high-grade clean copper concentrate
- Impact of Covid-19 pandemic becoming protracted (Initial plans took impact of pandemic into account only for first half of 2020)
 - Despite continuing operation while taking infection prevention measures, production fell due to personnel restrictions, etc. (mainly 2020 and 2021)
 - Revision of medium/long-term production plans based on mining delay, etc.

➡ By **improving maintenance structure** (organization and systems enhancement; technical advancement), will seek to **catch up by fiscal 2022 with level near that initially planned**
Will also seek to raise level by introducing automation, etc.

Caserones copper production (1,000 t)



Infection prevention measures in place



Carrying out rare metal surveys and development

- From the standpoint of Group synergy (e.g., resource supply to midstream and downstream operations), specific items centering on tantalum and titanium are being evaluated
While judging when the pandemic will be brought under control, we will carry out field surveys more actively

2-3-2. Base Businesses Progress (Metals and Recycling): Continuation of measures to become more competitive by leveraging smelting and refining strengths

Promoting integrated operation of smelting & refining and recycling in line with original plans, we will continue to build a robust business structure resilient in all market environments

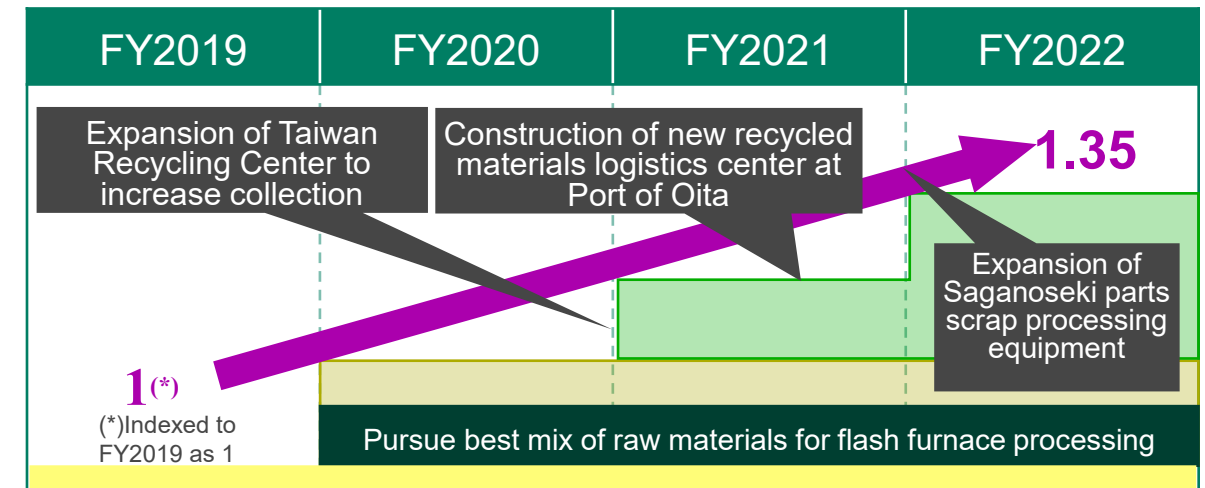
- Take measures to increase high-margin resources (mainly recycled materials) while also stabilizing operations
- Concentrate recycling functions at cost-competitive sites (end operations at Tsuruga Recycle and enhance Saganoseki Smelter & Refinery)
- Promote development of hybrid smelting technology using clean ores from Caserones (details in 2-5-3)

- Impurity grade is rising in copper concentrate
- Recycled materials contain impurities



Increase processing of recyclable materials using “clean ores”

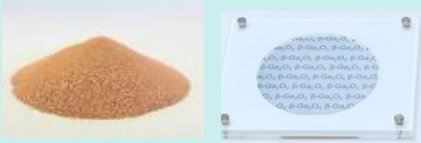
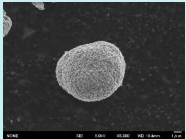


■ Initiatives to expand processing of recycled materials



Increase the amount of recycled materials processed during the period of the medium-term plan by 1.35 times over FY2019 levels

2-4-1. Technology Development: Cultivating next-generation core businesses

- Seeing the advance of the data-driven society, decarbonization, and other **social trends as business opportunities**, aim for **early commercialization**
- Toward early commercialization and the discovery of new products for the next-generation and beyond, promote **Group collaboration** and **working with startups**

Product groups seen promising as core business in next generation and beyond	Examples of initiatives	
<ul style="list-style-type: none"> ■ Next-generation semiconductor materials ■ Metal powders for additive manufacturing ■ Crystal materials ■ Battery materials ■ Lithium-ion battery recycling  	<h3>CVD materials (chlorides)</h3> <ul style="list-style-type: none"> ■ High-purity chlorides for leading-edge semiconductors with advanced scaling and 3D stacking ■ Manufacturing and development are being carried out through Group collaboration (JX, Toho Titanium, and TANI OBIS), applying the high purification and chloridization technologies of each company ■ Samples are being evaluated by multiple customers 	<h3>Collaboration with Alloyed (UK)</h3> <ul style="list-style-type: none"> ■ Development of metal powders such as copper, tantalum, and niobium for additive manufacturing, and creation of applications ■ Development of new copper alloys for connectors and other conductive parts and materials ■ Dispatching of engineering staff <div data-bbox="1832 1079 2364 1139">Recent activity by Alloyed</div> <p>Partnership with NTT Data XAM Technologies Corporation (Development of Japan's 3D printing market)</p> 

2-4-2. Technology Development: Promotion of industry-academia collaboration and use of Research Institute for Technology & Strategy

Industry-academia collaboration

Established joint research chair at Osaka University Graduate School of Engineering for promoting a circular economy (April 2021)

■ Research Topics

- R&D and social implementation related to smelting, refining, and recycling considering the overall material flow of nonferrous metals
- R&D and social implementation related to reducing manufacturing energy requirements; advancing joining, bonding, corrosion resistance, and reliability evaluation techniques; numerical analysis methods; and new materials creation, etc.

*The Company sent personnel to serve in **pecially appointed professor, visiting academic staff**, and **visiting researcher roles**

Besides continuing to strengthen initiatives with existing partners, we are considering new partnerships



JX Nippon Research Institute for Technology & Strategy

Established **JX Nippon Research Institute for Technology & Strategy** to play a leading role in proposing Group technology strategy (April 2021)

■ Services

- Nonferrous metals-related surveys, research, consulting
- Active participation also in industry, government, and academia discussions in the field of nonferrous metals

■ Progress

- Starting in April, **eight technical seminars were held** with invited experts as instructors
- Services were also commissioned by outside organizations

Activities are under way aimed at becoming a **think tank for the entire nonferrous metals industry**

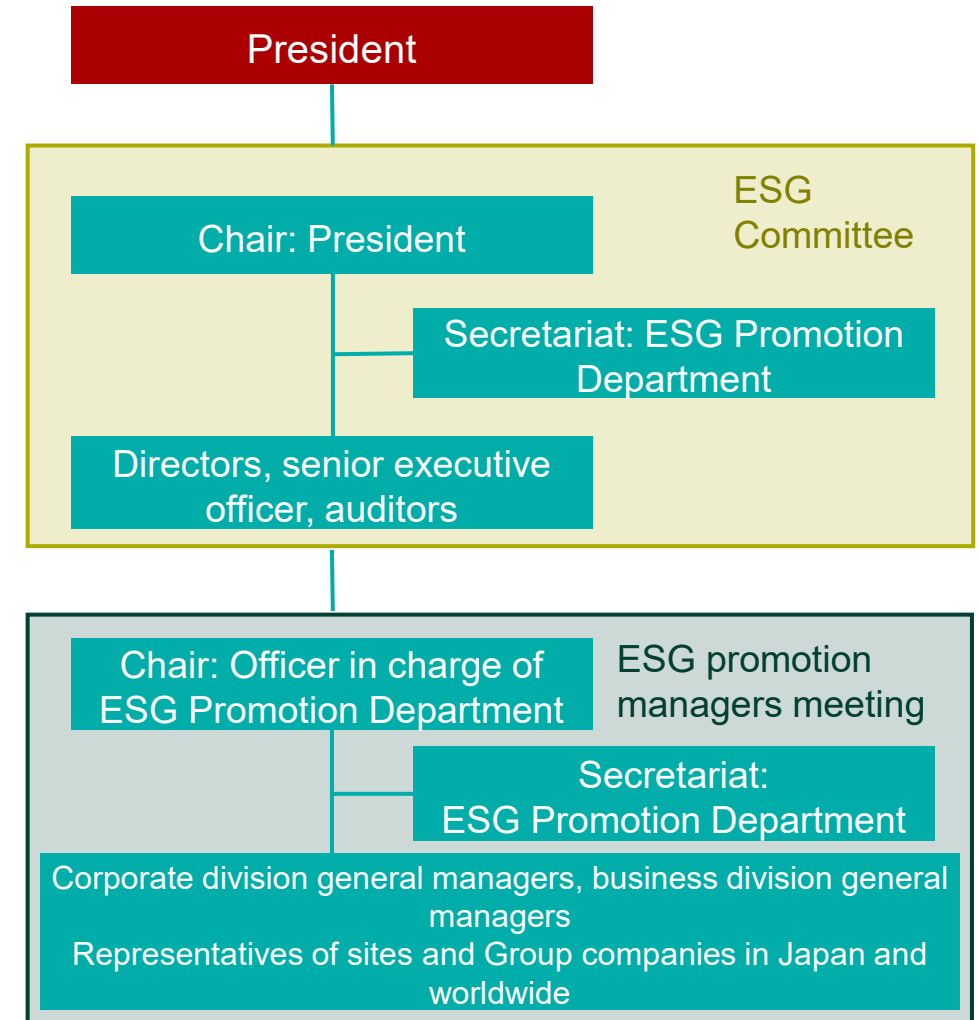
2-5-1. ESG Management Promotion: Setting up an organizational structure for promotion

- ESG being a top priority management theme for the Group, in October 2020 we **established the ESG Promotion Department** and related committees.
- Having defined the following three **priority issues**, we are carrying out initiatives across the entire Group.

Addressing climate change

Contributing to
a recycling-oriented society

Complying with international norms
and initiatives



2-5-2. ESG Management Promotion: Decarbonization initiatives

Environmental Targets (Long-Term)

Achieve **50% reduction** in our total emissions* by fiscal 2030 (moved up 10 years from target when plan was drafted)

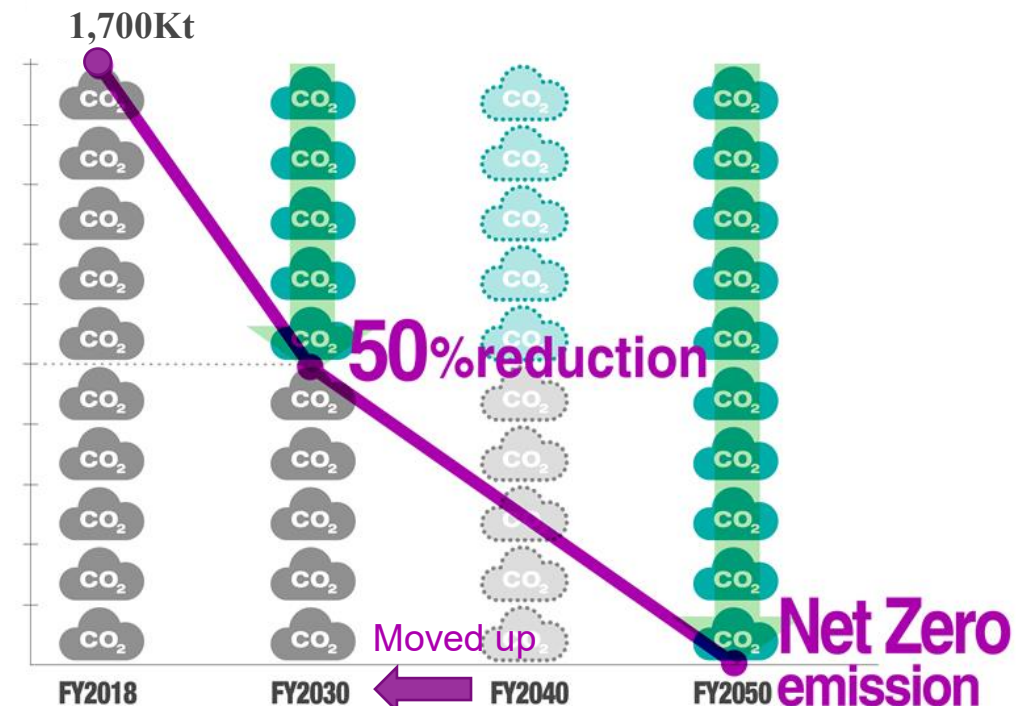
Achieve **net zero emissions** by fiscal 2050

*Compared to FY2018 levels

■ Initiatives toward achieving targets

- Switch to CO₂-free electricity in all business areas
- Create renewable energy (considering installation of solar panels at each business facility, etc.)
- Step up promotion of recycling
- Make use of idle forests at former mining sites (tie-up with ENEOS/woodinfo, etc.)

Establish ESG investment allocation toward realization, and promote activities



2.5.3. ESG Management Promotion: Toward establishment of a recycling-oriented society

Promotion of hybrid smelting technology	Promotion of lithium-ion battery recycling
Aim for a recycled materials input ratio of 50% in copper smelting and refining by 2040	On the way to realizing closed-loop recycling of onboard lithium-ion batteries, work to establish mechanisms and technology
Objectives <ul style="list-style-type: none"> Aim to reduce energy consumption and obtain stable supplies of resources by means of high-efficiency, large-scale recycling that makes effective use of excess heat generated in processing copper concentrate 	Devise mechanisms <ul style="list-style-type: none"> Collaborate with automakers, and link to development of cathode materials for solid-state lithium-ion batteries
Enhance organizational structure <ul style="list-style-type: none"> Newly established the Saganoseki Branch of the Technology Development Center (October 2020) Merged the Smelting Technology Department and the Recycling Technology Department (April 2021) 	Develop technology <ul style="list-style-type: none"> Carry out ton-based verification experiments at Tsuruga* [Expected start of recovery] Nickel sulfate: 2021 first half Cobalt sulfate: 2022 first half

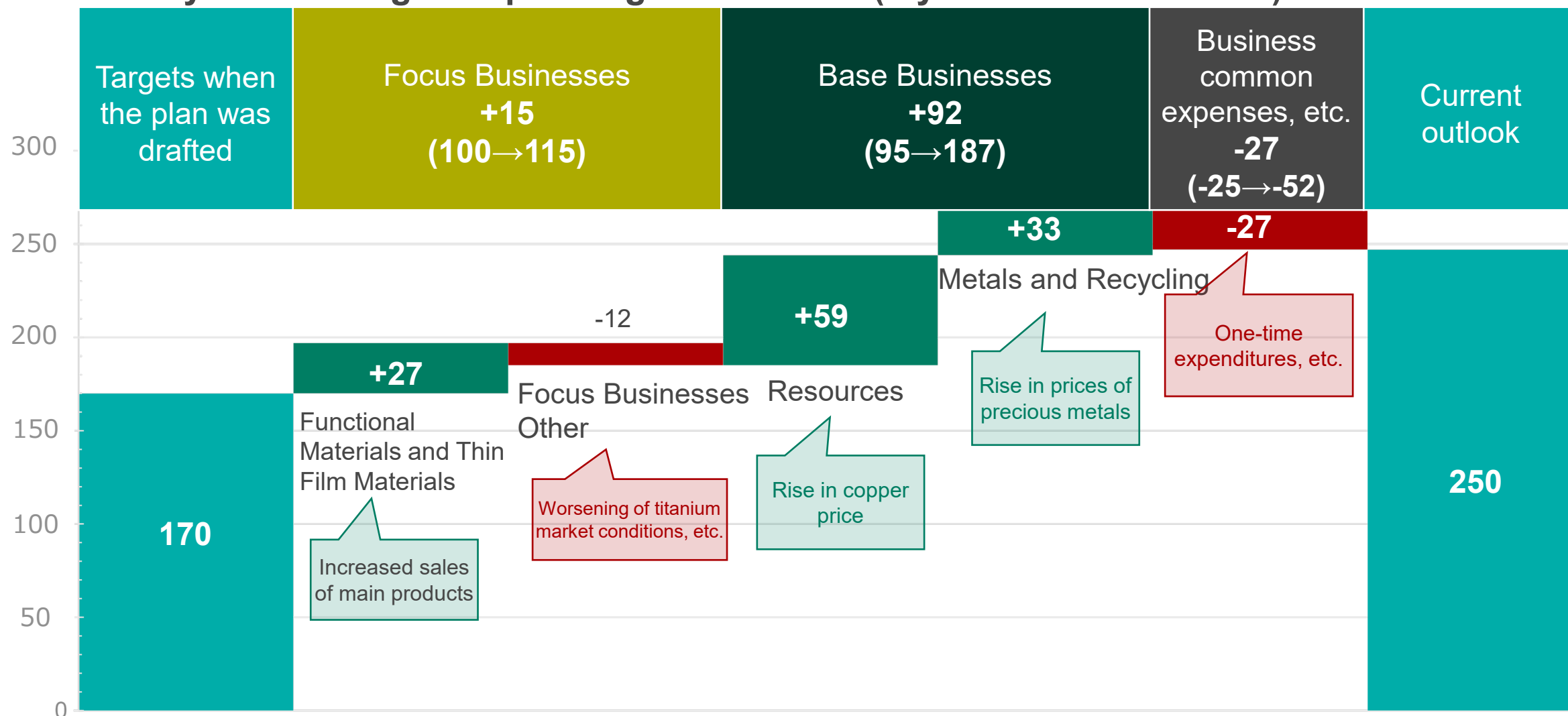
*JX Metals Circular Solutions was established in May 2021 and is to start operation in October.

3. Reference Data

3-1. Outlook When Medium-Term Plan Was Drafted and Current Outlook

Analysis of change in operating income/loss (3-year cumulative total)

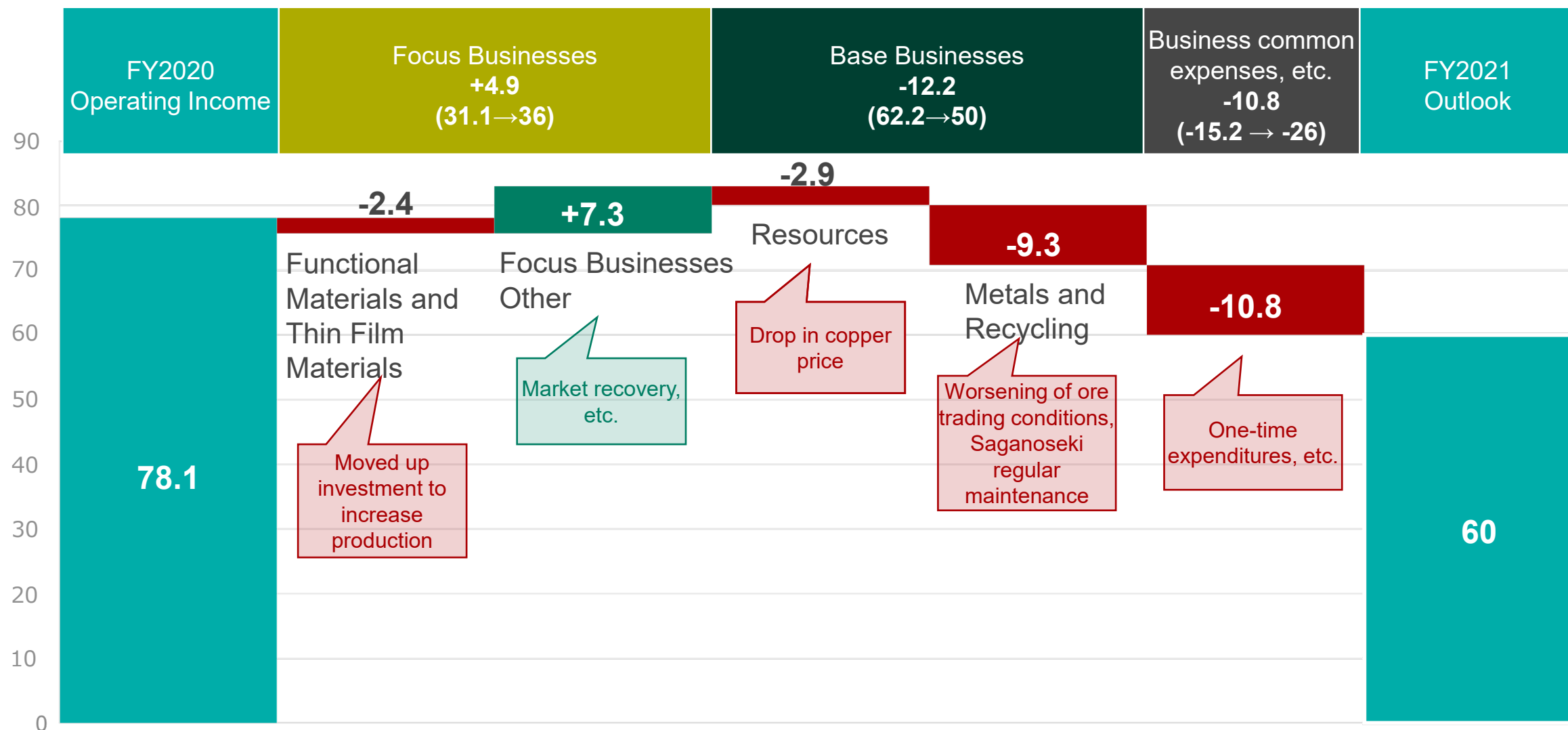
(bil. yen)



3-2. Fiscal 2020 Performance vs. Fiscal 2021 Outlook

Analysis of change in operating income/loss

(bil. yen)



3-3. Segment Information

(bil. yen)

	2020 actual	2021 outlook	2020-2022 3-year cumulative total
Total operating income/loss	78.1	60	250
Functional Materials, Thin Film Materials, etc.	31.1	36	-
Focus Businesses total	31.1	36	115
Resources	34.9	32	-
Metals and Recycling	27.3	18	-
Base Businesses total	62.2	50	187
Business common expenses	-15.2	-26	-52

3-4. Main Factors and Sensitivity

■ Market factors

Yellow highlighted data announced 5/12

		2020 actual	2021 outlook		2022 outlook	
			vs. 2020 actual		vs. 2020 actual	
Exchange rate	Yen/\$	106	105	(−) 1	105	(−) 1
Copper price	¢/lb	312	340 ^(※)	(+) 28	320	(+) 8
Sales volume of precision rolled products	1,000t/month	3.6	3.9	(+) 0.3	4.1	(+) 0.5
Equity entitled copper mine production	1,000 cu-t	194	223	(+) 29	258	(+) 64
Caserones copper production	1,000 cu-t	122	136	(+) 14	165	(+) 43
PPC electrolytic copper sales	1,000t	634	629	(−) 5	638	(+) 4

■ Sensitivity (impact of variation on operating income) (bil. yen)

■ Outlook for FY2021

Forex	±5 yen	7
Copper price	±10¢	5

*Apr.–June 2021 400¢/lb
Since July 2021 320¢/lb

Cautionary Note on Forward-Looking Statements

Note that data and future projections indicated in this material reflect judgments based on information available at the time of this presentation. There are many risk factors and uncertainties inherent in such projections, and no guarantee is made of achieving the forecasts or of future performance.

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JX Nippon Mining & Metals Corporation

