

IR-Day 2024

**Briefing for Medium-Term Targets
and roadmap to achieve
Carbon Neutrality**

April 10, 2024



MINING THE FUTURE

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Sustainability of SMM Group

Through our Corporate Philosophy of “**co-existence with the global environment and society**” and “**respect for all individuals,**” which are based on Sumitomo Business Spirit, placing value on social trust and mutual relationships, we seek to balance the **sustainable development of society** with **sustainable growth of our company.**

Sumitomo Business Spirit

SMM Group Corporate Philosophy

Co-existence with the global environment and society

Respect for all individuals

Global environment

Effective Use of Non-Ferrous Metal Resources

Climate Change

Significant Environmental Accidents

Biodiversity

Society

Co-Existence and Mutual Prosperity
with Local Communities

Rights of Indigenous Peoples

Human Rights in the Supply Chain

Engagement with Stakeholders

People

Employees' Occupational Health and
Safety

Diverse Human Resources

Development and Participation of
Human Resources

Sumitomo Metal Mining Group Sustainability Policy

Contributing to sustainable development of society and realizing sustainable growth for our company

Sustainability Promotion Structure

- Promote sustainability activities centered on the Sustainability Committee chaired by the President
- The Board of Directors exercises oversight by receiving and discussing regular reports on sustainability activities.

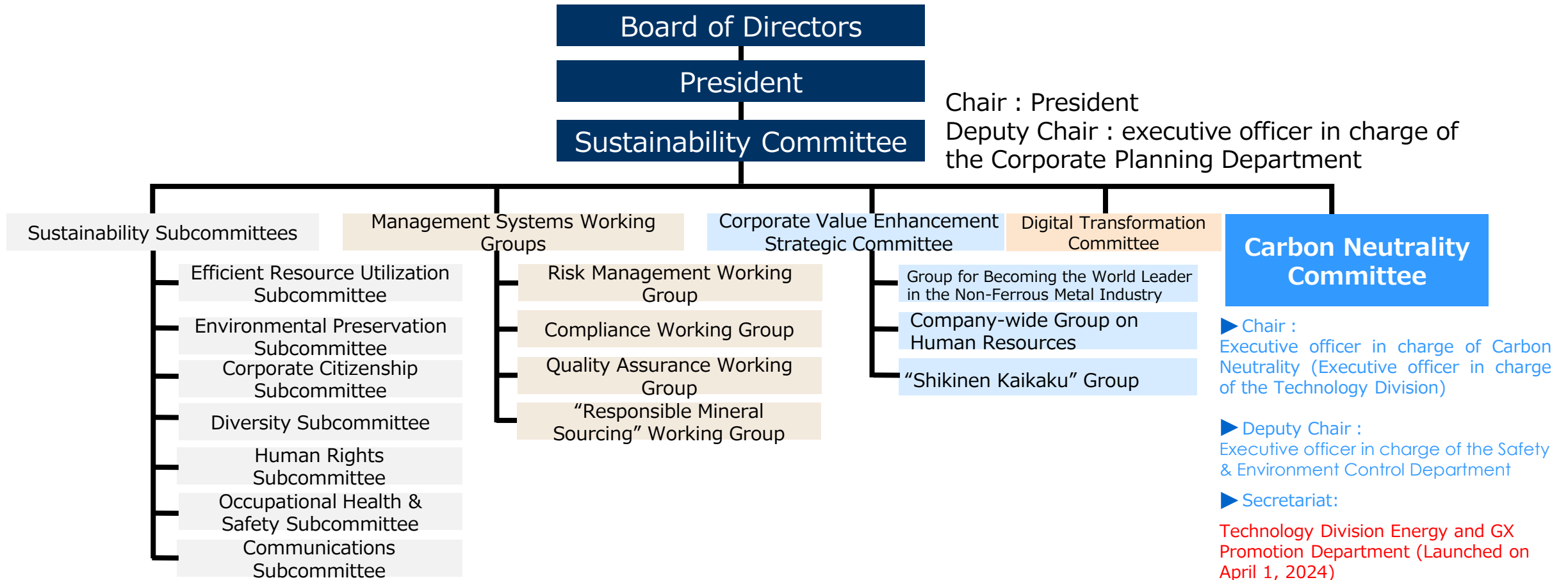


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Vision and Targets for 2030 against Climate Change

**Material
Issues**

Climate Change

Vision for 2030

A company that actively undertakes climate change countermeasures, by reducing emissions and stably supplying products contributing to a low-carbon society, a future with zero greenhouse gases (GHGs)

• **Revise of KPI targets**

**Reduce GHG emissions by 38% or more compared to FY2015
(More than 50% in Japan, 24% out of Japan),**

Promote various measures to achieve “Net Zero GHG Emissions by 2050”

Underline the areas to be revised in December 2023

■ Substantial increase of the target in the Paris Agreement on Climate Change, from 2°C target to 1.5°C target (COP26)

26% reduction in 2030 ► **45% reduction in 2030, Net Zero in 2050**

Stricter Emission Reduction Regulations

- Raise the Japanese government's 2030 target (46% reduction by 2030)
- Establishment of GX League (join in April 2024)
- GX Promotion Act (emissions trading system, fossil fuel levy)
- European Battery Regulation (mandatory calculation of CFP, prohibition of products with high CFP on the market)
- European carbon border adjustment measures (carbon levy)

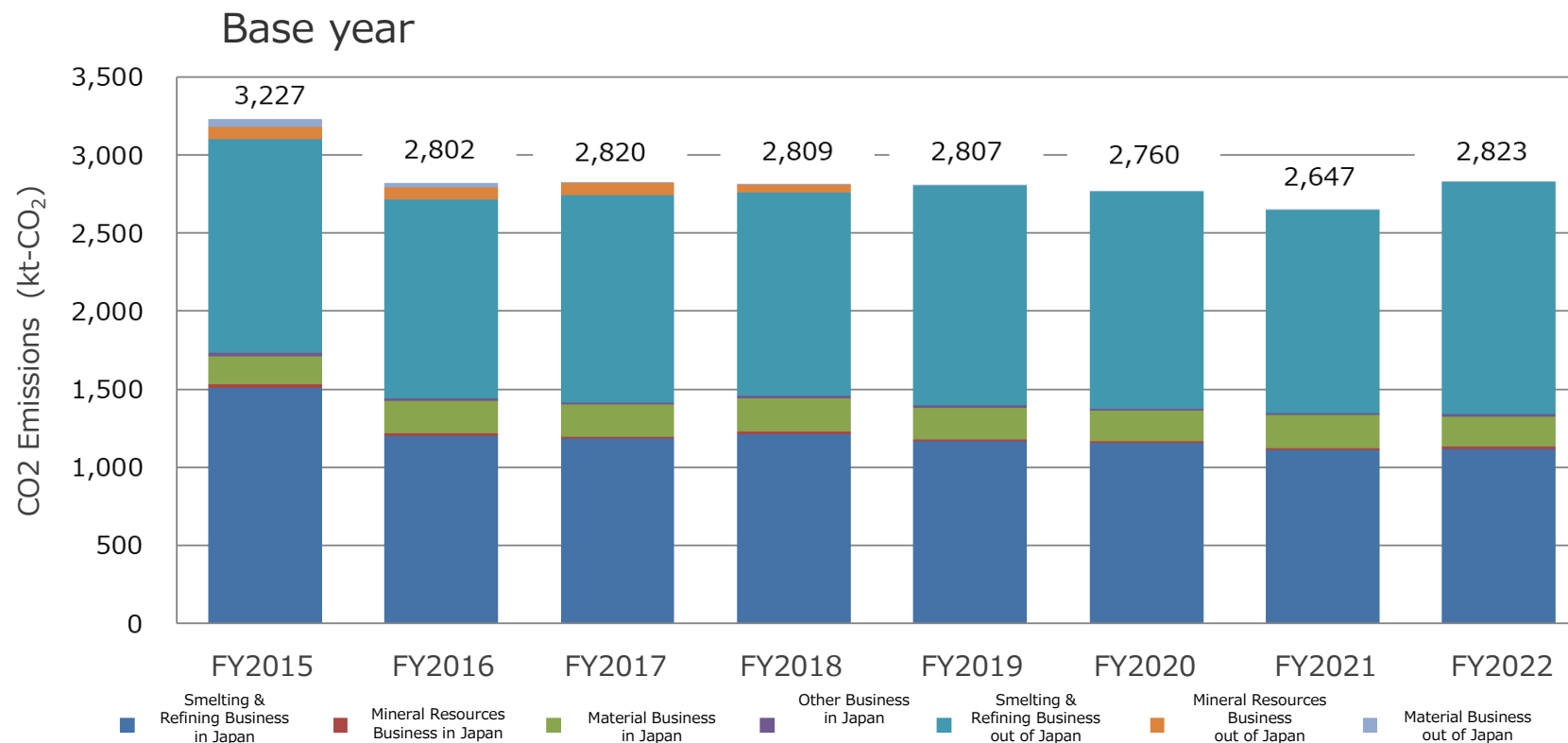
Stricter disclosure regulations

- Recommendations of TCFD
- Revision of Corporate Governance Code
- Mandatory disclosure of climate-related information in Annual Securities Reports
- ISSB/IFRS climate-related information disclosure requirements

GHG emissions (scope1+2) remain flat

■ GHG emission for FY2022 was 2,823k tons-CO₂, Smelting business accounts for 90%

- In smelting, a decline in the grade of raw ore, and deterioration in energy emissions intensity due to increased impurities, are offsetting improvement by energy conservation ► **Difficult to achieve reduction targets by conventional extension**



【Reference】 Breakdown of GHG emissions (scope1+2)

Scope1(Energy Origins) ; GHG emissions by businesses themselves(Fuel combustion)

Scope1(Non-Energy Origins) ; GHG emissions by businesses themselves(Chemical reactions in production processes)

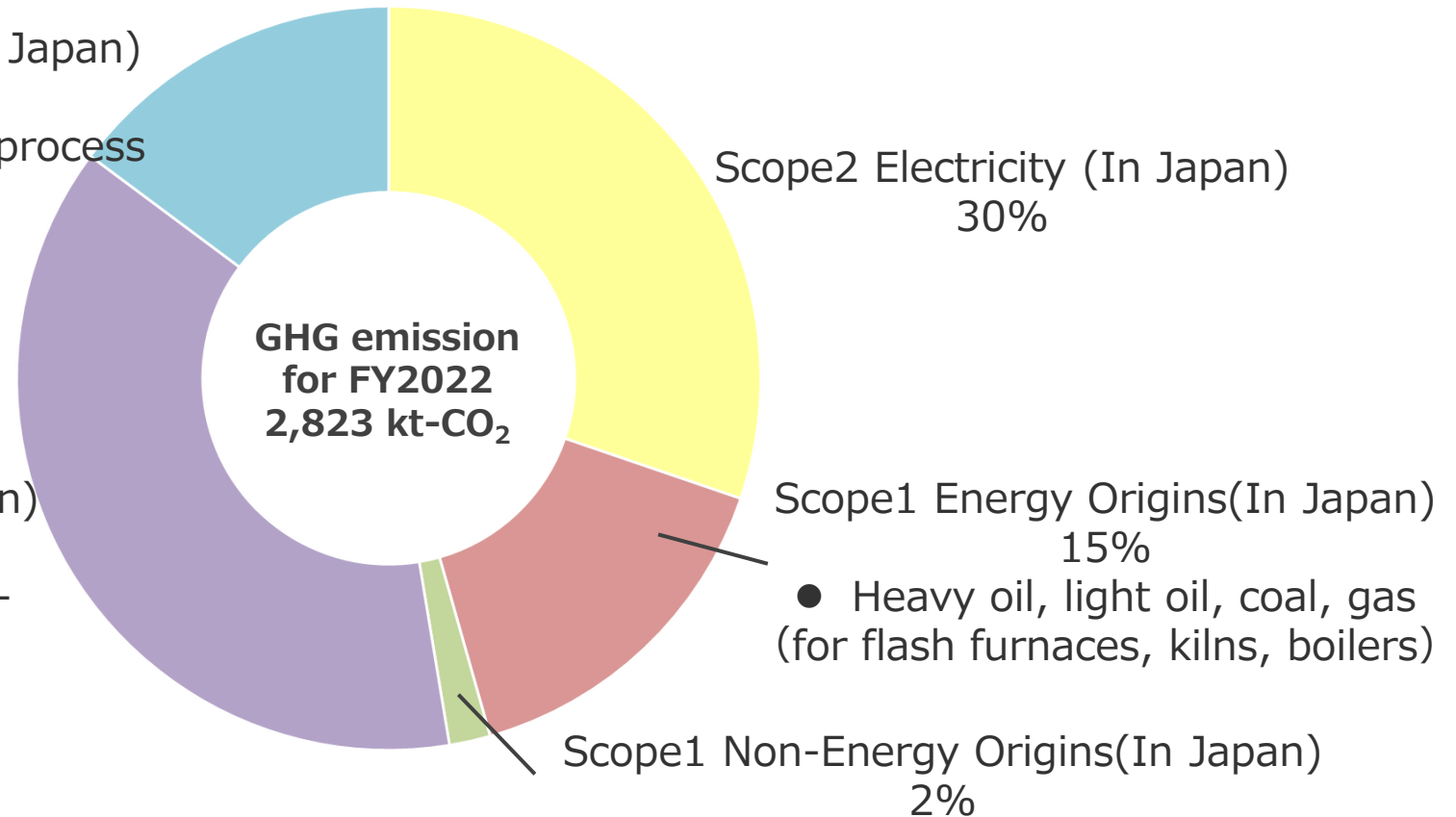
Scope2 ; Indirect GHG emissions generated through the use of electricity, heat, and steam supplied by other companies

Scope1 Non-Energy Origins(Out of Japan)
15%

- effluent neutralization for HPAL process

Scope1 Energy Origins(Out of Japan)
38%

- Coal (For self-generated coal-fired power plants)



Scope1 Energy Origins(In Japan)
15%

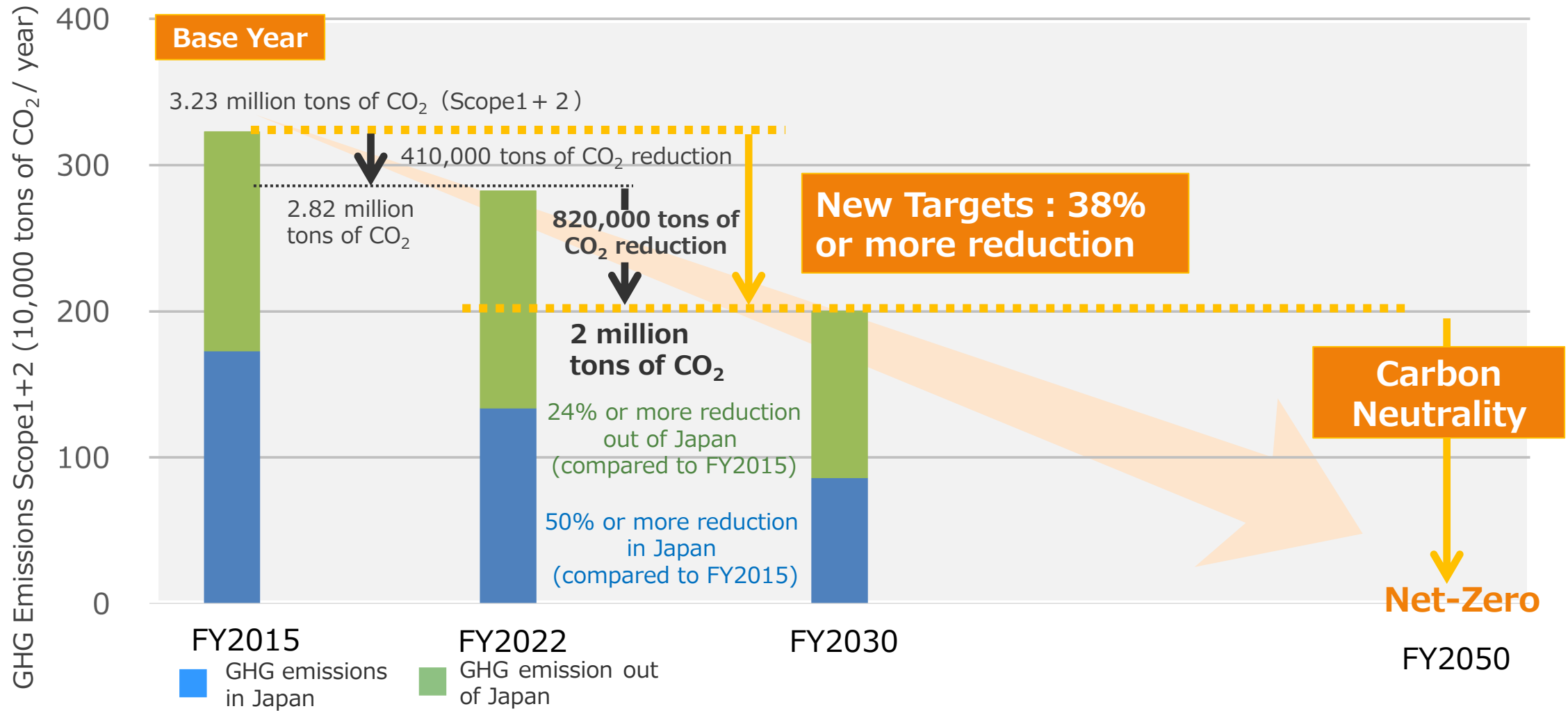
- Heavy oil, light oil, coal, gas (for flash furnaces, kilns, boilers)

Scope1 Non-Energy Origins(In Japan)
2%

Roadmap to achieve Carbon Neutrality in 2050

Official announcement
December 26, 2023

- Reduction target for FY2030 : 38% or more reduction compared to FY2015 (More than 50% in Japan, 24% out of Japan)



Initiatives to achieve Carbon Neutrality in 2050

Official announcement
December 26, 2023

Initiatives to FY2022

Initiatives for FY2030

Initiatives for FY2050

	Initiatives to FY2022	Initiatives for FY2030	Initiatives for FY2050
Process Improvement	<ul style="list-style-type: none"> Energy saving and higher efficiency Restructuring of production system (Harima Refinery·Hyuga Smelting Co., Ltd and others) 	<p>Maximize use of available technology</p> <ul style="list-style-type: none"> Thorough energy saving and higher efficiency 	<p>Ongoing Initiatives</p> <p>Introduction of new technology</p>
Energy Conversion	<ul style="list-style-type: none"> Transition from heavy oil to LNG (Isoura Plant·Nickel Refinery) Introduction of solar and geothermal binary power generation (Hishikari Mine·Ome District Div. and others) 	<ul style="list-style-type: none"> Expand conversion from heavy oil and coal to LNG and woody biomass fuel Electrification of heat-using equipment Expand introduction of renewable energy generation Use of carbon credits 	
Improvement in modulated power discharge coefficient	<ul style="list-style-type: none"> Switching to renewable electricity (Harima Refinery·Hishikari Mine) 	<ul style="list-style-type: none"> Expand use of renewable electricity Use of Renewable Energy Certificates 	
Technology Development	<ul style="list-style-type: none"> Exploration and Basic Research 	<ul style="list-style-type: none"> Pilot and Demonstration Tests 	
Use of External Technology		<ul style="list-style-type: none"> Study and preparation for application of new technology 	
			<ul style="list-style-type: none"> Demonstration and commercialization of our unique innovative smelting process Use of green hydrogen, green ammonia, and synthetic methane Use of CO2 separation, recovery, and immobilization technologies (CCUS)

Introduction of case studies

Ongoing Initiatives

Introduction of new technology

Demonstration and commercialization of our unique innovative smelting process

- Use of green hydrogen, green ammonia, and synthetic methane
- Use of CO2 separation, recovery, and immobilization technologies (CCUS)

■ Concept of Initiatives

Maximize use of available existing technologies and develop low-GHG manufacturing process technologies as thorough energy conservation and efficiency improvement at plants, fuel conversion to LNG and woody biomass, conversion of procured electricity to renewable energy, etc.

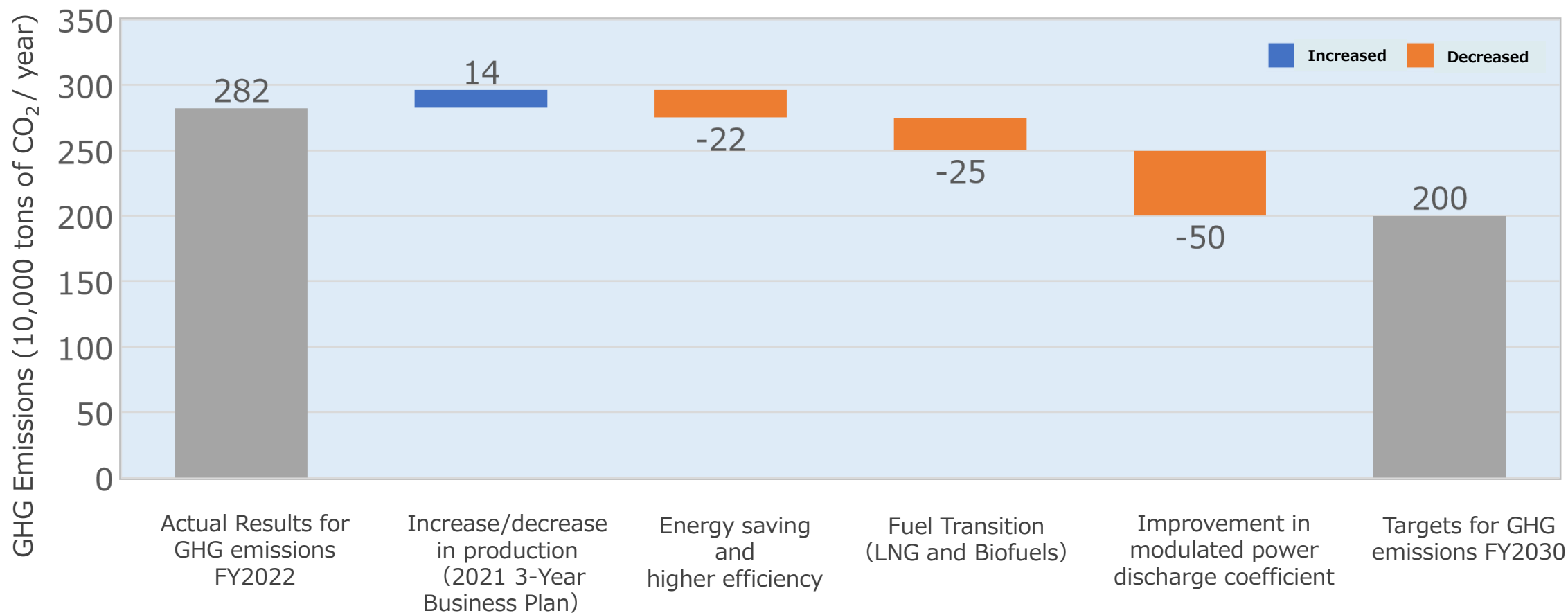


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■ Decided to introduce the ICP system in September, 2020

Operation starts from FY2021 budget

- ICP Price:

JPY20,000/t-CO₂ (Increased from JPY5,000 in FY2022)

- ICP Subject:

After evaluating their profitability, projects that contribute to the enhancement of our group's technological capabilities and corporate value through GHG reductions

Applies not only to capital investment but also to the cost of introducing renewable energy

- Application Examples:

LNG fuel conversion , Biofuel co-firing , Fan efficiency improvement , Solar power generation , Steam reduction , Exhaust heat recovery , Boiler feed water quality improvement, etc.

■ Nickel Refinery (Nickel)・Isoura Plant (Battery Materials)

- Transit fuel used in boilers at Nickel Refinery and Isoura Plants from heavy oil to LNG in stages from FY2022 to FY2023
- GHG emissions reduction(year) : About 13,000 t-CO₂

■ Toyo Smelter & Refinery (Copper)

- LNG conversion of drying facilities, steam superheating facilities, etc. is underway from FY2023 to FY2025

*Reduces heavy oil-derived CO2 emissions by approximately 20 to 30%



LNG Boiler Facilities
(Nickel Refinery)

■ CBNC, THPAL

- Started woody biomass co-firing test for coal-fired power plant (in-house power generation) in FY2023
- Aiming for a gradual increase in the ratio of co-firing

■ Hyuga Smelting Co., Ltd., Shisaka Smelting Co., Ltd., etc.

- Study on co-firing coal (used as fuel and reductant in rotary kilns) with woody biomass

Issues

- Confirmation of stability of boiler and kiln operation when increasing the proportion of wood pellets
- Procurement of required quantity of wood pellets



Wood pellets
(source : wood pellets- Wikipedia)



CBNC

■ Use of power company's renewable energy menus

- Our Group's GHG emissions from electric power generation (in Japan) account for 30% of the total (FY2022 results) , Sequentially switch to renewable energy menu for Harima Refinery, Hishikari Mine, Hyuga Smelting, Head office building, etc.



Harima Refinery



Hishikari Mine



Hyuga Smelting Co., Ltd.



Head office building

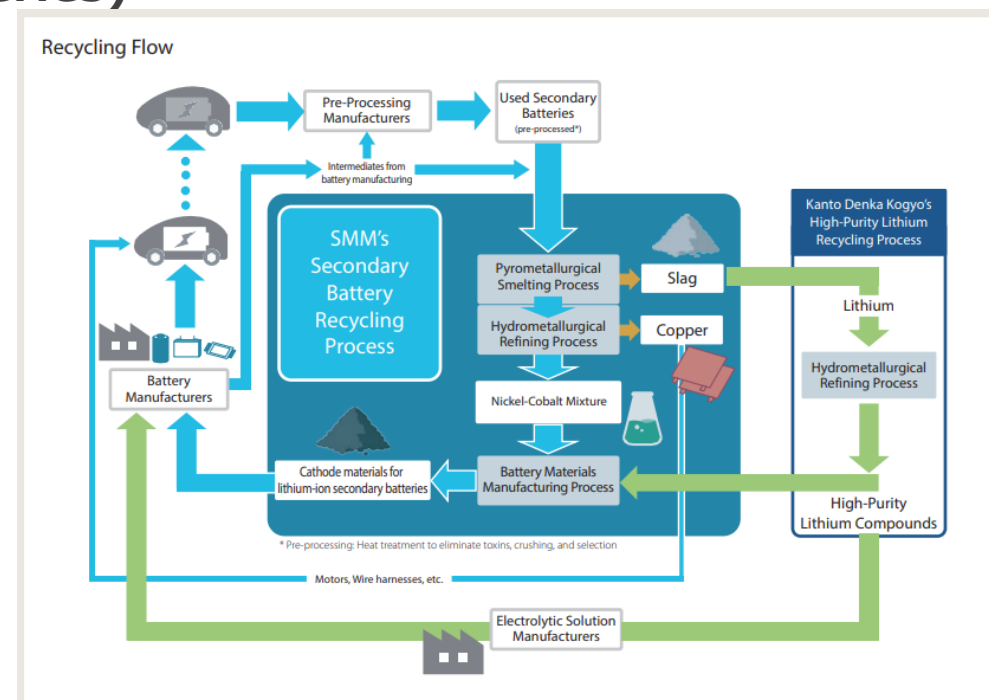
■ Collaboration with offshore wind farm operators

- Establishing collaborative relationship with Sumitomo Corporation and TEPCO Renewable Power, Inc. after being selected as offshore wind farm operator in Ejima, Saikai City, Nagasaki Prefecture, Considering using green power from wind power generation

Issue

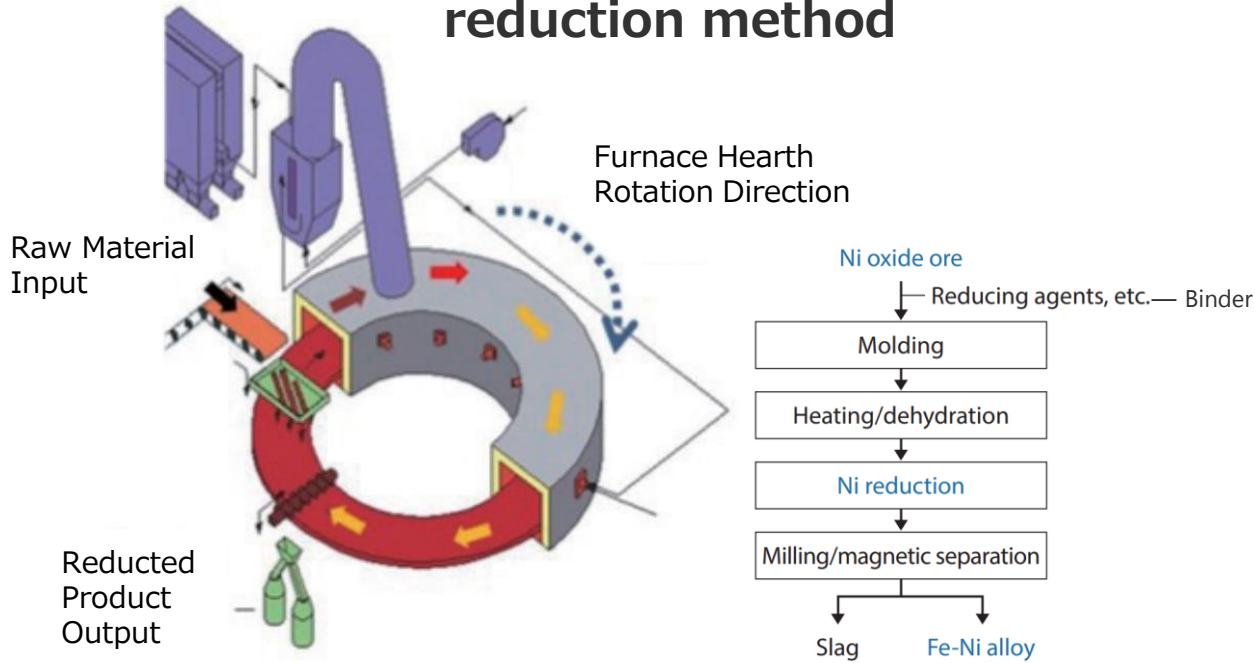
- Reduction of CO2 emission factor for electric power companies

- **Development and demonstration of high-performance cathode materials for next-generation storage batteries (Research and development of high-performance storage batteries and materials)**
 - Developing **high-performance cathode materials and low-cost, low-GHG-emission mass production processes** that will enable the commercialization of high-performance lithium-ion batteries, including all-solid-state batteries, by 2028
- **Development and demonstration of storage battery recycling process (Development of technologies related to the recycling of storage batteries)**
 - Create and expand a business that recovers copper, nickel, cobalt, and lithium from used lithium-ion batteries and other rechargeable batteries and recycles them horizontally, using our nonferrous metal smelting technology and lithium recovery technologies of KANTO DENKA KOGYO CO.,LTD
 - Plant construction is scheduled to start in FY2024 and to be completed in June 2026



■ New CN Nickel Smelting Process

Ni-preferential reduction method

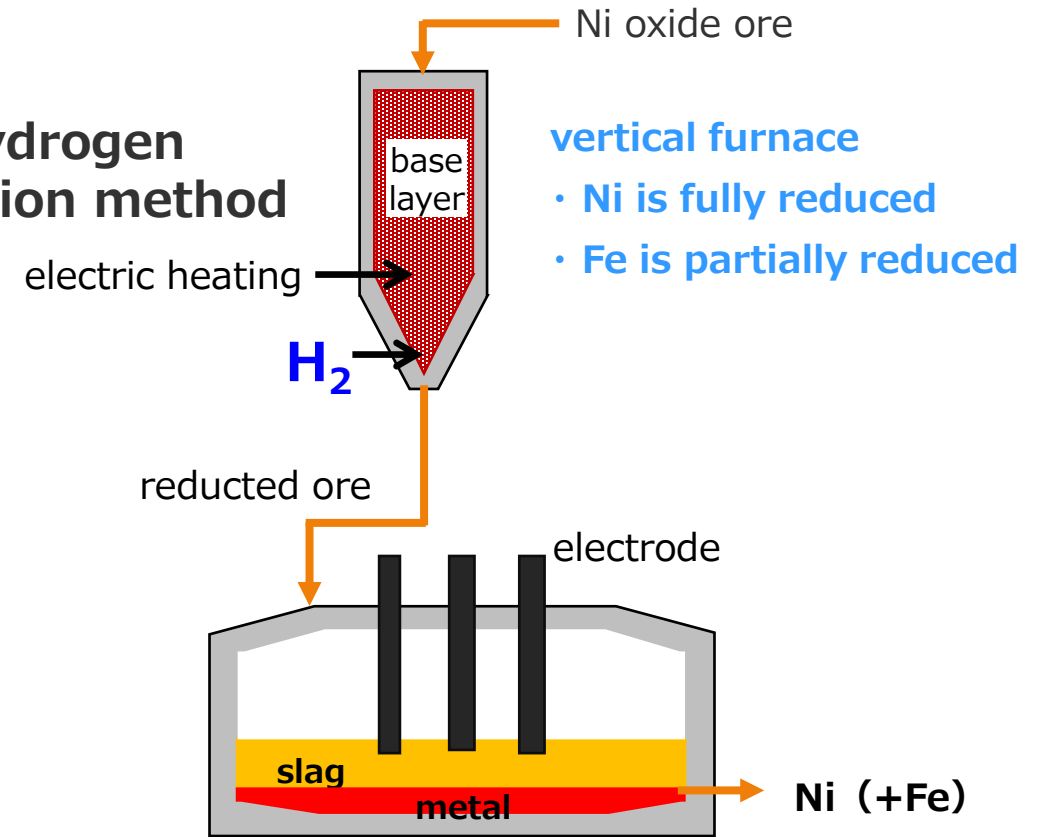


Can be processed at lower temperatures for short periods of time

- ⇒ **Significant reduction in GHG emissions and energy use**
- ⇒ **Zero GHG emissions by using biomass-reductant + green electricity for heat source**

Target : Commercial operations starts by 2050

Hydrogen reduction method



Reduction by hydrogen only

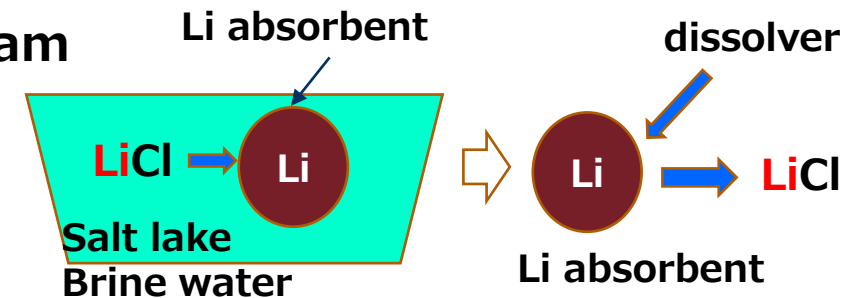
- ⇒ **Zero GHG emissions and fully carbon neutral**
- **Target nickel recovery ratio demonstrated experimentally**

**Target for near future :
Pilot testing to start in 2030**

■ Demonstration test to recover lithium from a salt lake (direct lithium extraction method)

- Developed a process for selective adsorption and recovery of lithium (DLE) that **uses as little CO₂-generating chemicals as possible** in the manufacturing process
- Currently, the process reliability is being verified at the pilot plant scale, the adsorbent is being improved, and the target salt lakes for lithium recovery are being narrowed down, with the aim of completing the process by 2030

conceptual diagram
of DLE



■ Development of technology to absorb and fix CO₂ using waste ore

- **Magnesium ore** accompanying nickel oxide ore **has a high CO₂ absorption capacity**, thus promoting joint research with universities to realize high-speed and large-volume CO₂ fixation
- Due to the large volume of ore to be handled, **a realistic CO₂ absorption method** will be studied and demonstrated, aiming to complete the process by 2050

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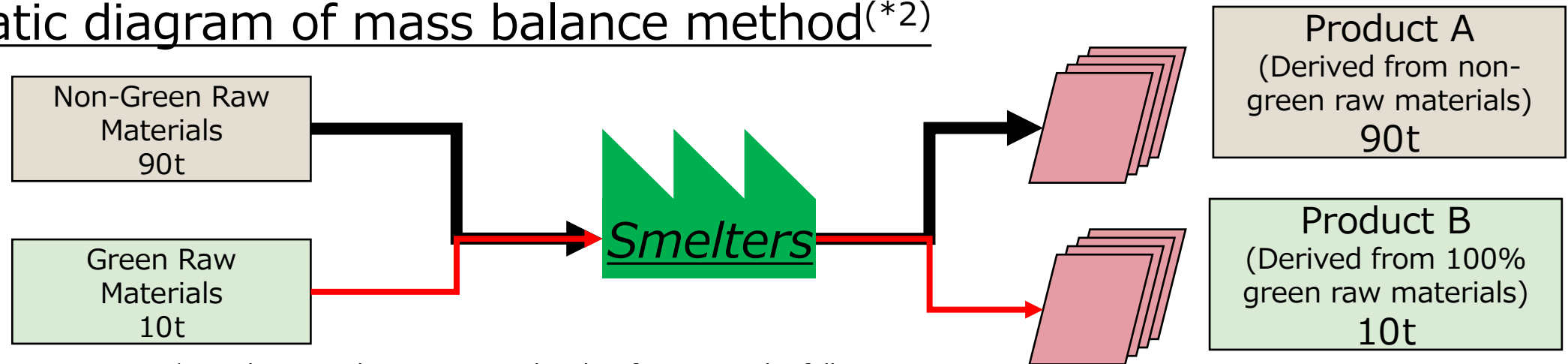
SMM green metal concept using mass balance method

■ Embodying the SMM Green Metal Initiative to provide low GHG emission products

- For electrolytic copper, obtained limited assurance from a third-party organization on the carbon footprint (CFP) calculation and the Chain of Custody (CoC) process in April 2024 and planning to provide low GHG emission electrolytic copper (green copper) using mass balance method (*1)

*1: a method of assigning a characteristic to a portion of the product to be produced according to the input ratio of the raw material with a certain characteristic when raw materials with different characteristics are mixed

schematic diagram of mass balance method(*2)



*2: Schematic diagram created with reference to the following source
Ellen MacArthur Foundation "Enabling a Circular Economy For Chemicals With the Mass Balance Approach",

consider obtaining limited assurance for CFP and CoC by third-party organizations for other metals in FY2024

Initiatives to reduce Scope 3

- Category 1 (purchased products and services) is the hot spot

Promote dialogue (engagement) with suppliers

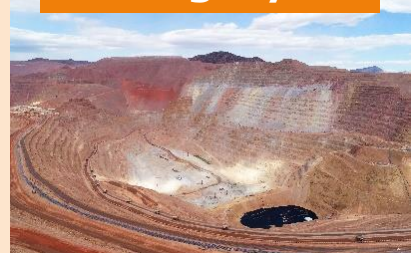
Data Refinement (Supplier Data Collection)

Set Scope 3 reduction targets

Monitoring

Scope3(Upstream)

Category 1



Overseas mine (copper concentrates)



transportation

Examples of Subjects for Category 1

- Copper concentrates
- Nickel oxide ore
- slaked lime
- lithium hydroxide

Scope 3²

Indirect emissions not covered by Scopes 1 and 2

61.6%
(4,530 kt-CO₂)

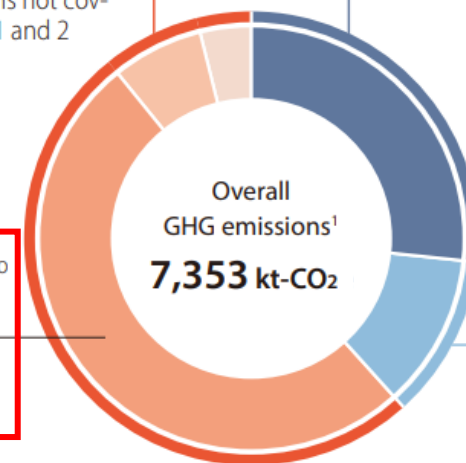
Emissions related to purchased goods and services (Category 1)
50.8%

Scope 1

Direct emissions
26.7%
(1,965 kt-CO₂)

Scope 2

Indirect emissions
11.7%
(858 kt-CO₂)



Scope1+2



Smelting (Toyo Smelter & Refinery)



Products (electrolytic copper)

Scope3(Downstream)

Wherever electricity is, copper is almost always used

- Buildings (water and gas pipes, power distribution lines, etc.)
- Infrastructure (power transmission and distribution lines, communication lines)
- Industry (transformers, motors, equipment, etc.)
- Transportation (automobiles, railroads, ships, etc.)

※ used as materials for a variety of applications, each with different GHG emission characteristics

Development of Low-Carbon Contribution Products and Business Development

■ Target for FY2030: Expansion of GHG reduction contribution of low-carbon contribution products **more than 600kt-CO₂**

- Battery cathode materials for use in automobiles
- Near-infrared absorbing materials (for automotive glass)



Actual results for FY2022
540kt-CO₂/year

Increased production capacity of battery cathode materials

- Construction of New Niihama Refinery (Nickel-based)
- Development of new process technology for LFP (lithium iron phosphate) cathode materials

Development and sales expansion of high-functional materials

- Launch of 「SOLAMENT®」, a material technology brand for CWO®(Near-infrared absorbing materials) → Entering the apparel and building materials industries, promoting collaboration
- Expansion of SiC(silicon carbide) substrate production
- Development and deployment of materials related to hydrogen production

Examples of low-carbon contribution products

	Contribution of SMM materials within the final product		
	Small←		→ Large
in process for mass-produced	<ul style="list-style-type: none"> Ni powder magnet Copper poly 	<div style="border: 2px solid red; padding: 5px; display: inline-block;">CWO</div>	<div style="border: 2px solid red; padding: 5px; display: inline-block;">Battery cathode materials</div> <p style="color: red; font-weight: bold;">Low-carbon contribution product (current)</p>
preparing for mass production		<div style="border: 2px solid blue; padding: 5px; display: inline-block; color: blue;">SiC</div> <p style="color: blue; font-weight: bold;">Low-carbon contribution product (candidate)</p>	<div style="border: 2px solid blue; padding: 5px; display: inline-block; color: blue;">LFP</div>
Research and development stage			<div style="border: 2px solid orange; padding: 5px; display: inline-block; color: orange;"> Related Hydrogen production · Nickel Oxide · Scandium · Photocatalyst </div>

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