

# Climate Change Initiatives

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GHG Reduction Targets and

Scenario Analysis on Climate Change Risks and Opportunities

February 10, 2023



# Our Goal (Realizing a Decarbonized Society)

## Environmental Policy

### Advance Decarbonization

We work towards the decarbonization of our business activities by reducing energy consumption. We will also tap into geothermal and other renewable energy sources to decarbonize our entire value chain.

## Reduction targets

- Reduce in-house GHG emissions (scope 1 + 2) by 47% or more by FY2031 (compared to FY2021)
- Achieve carbon neutrality by FY2046
- Reduce GHG emissions from the activities of supply chains(Scope 3) by 13% or more by FY2031 (compared to FY2021)
- Renewable energy utilization rate for electricity used in-house: Target is 100% by FY2036, 66% of which will be self-sufficient using in-house renewable electricity

## Responding to climate change risks and opportunities based on TCFD recommendations

- Analyze carbon tax and energy costs across the company, and risks and opportunities in each business specific theme

## Investment

- Plans to invest 10.5 billion yen in energy conservation and facility improvements by FY2031
- Plans to invest 30 billion yen in Renewable energy business by FY2031
- Assumption that approx. 1,200 GWh will be switched to renewable energy as of FY2031 (1.2 billion yen increase compared to FY2021)

## Carbon Neutral

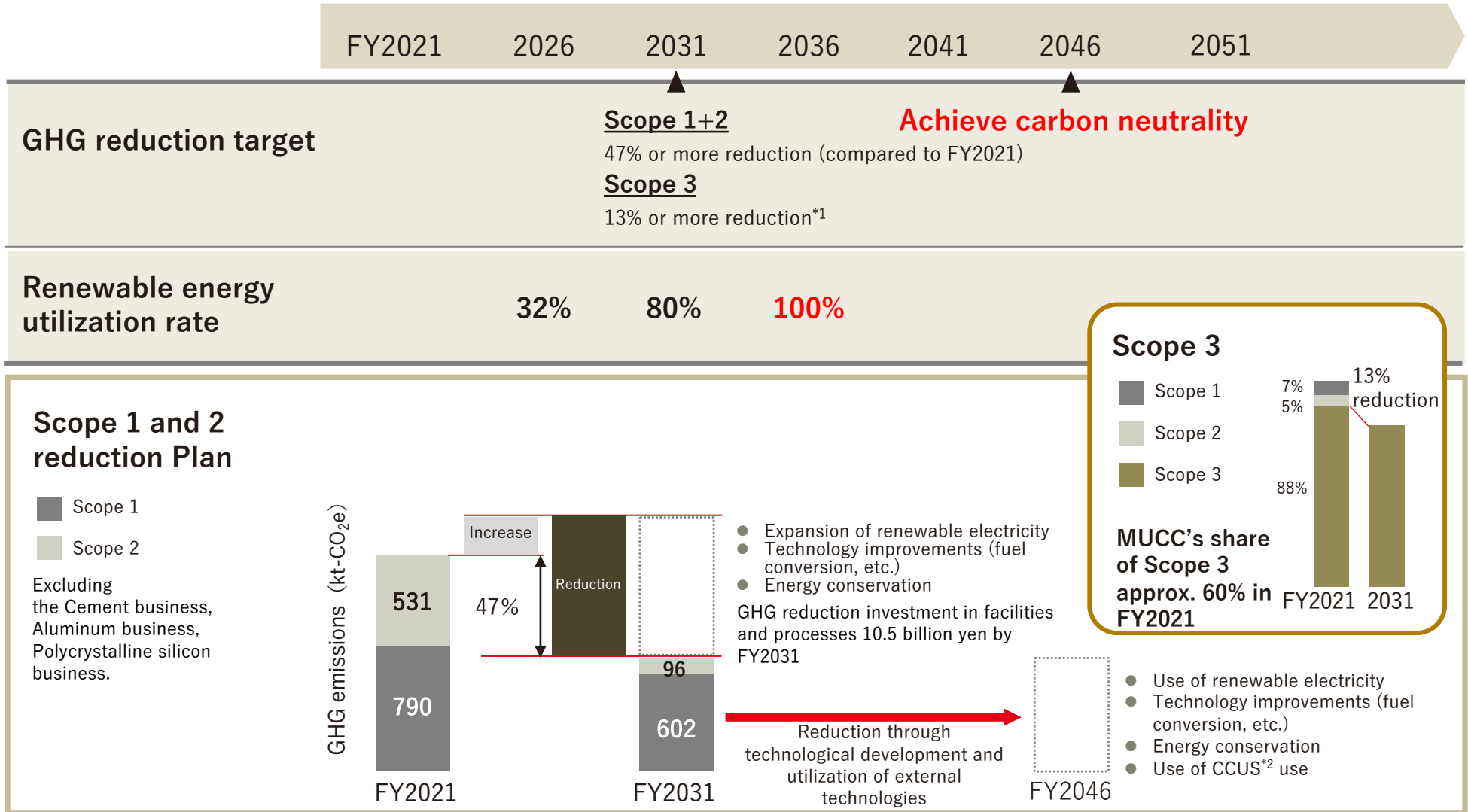
Responding to climate change risks and opportunities based on TCFD recommendations

Participation in Initiatives

OECM Nature Coexistence Site

# Carbon Neutral: GHG Reduction Targets

- Target of carbon neutrality by FY2046 and 100% self-sufficiency in renewable energy power by FY2051
- Reduction focused on Scope 2 for FY2031



\*1 Categories 1, 3, 15 compared to FY2021

\*2 Carbon dioxide Capture, Utilization and Storage

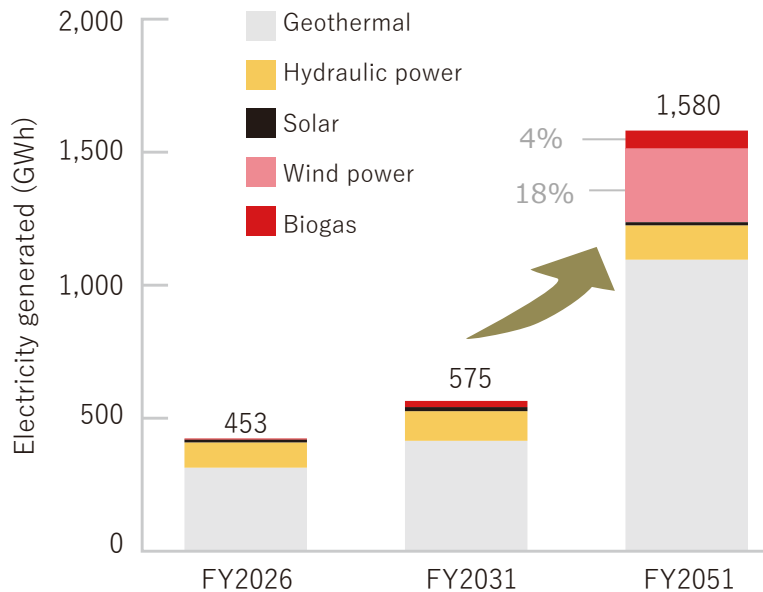
# Renewable Energy

	FY2021	2026	2031	2036	2041	2046	2051
Renewable electricity self-sufficiency rate		23%	25%	66%	Switching to renewable electricity for self-sufficiency		100%
Amount invested in Renewable energy business (billion yen)		30 (FY2024-FY2031)					
Renewable energy project investment effect period							
Procurement cost of renewable electricity (billion yen) (Addition to electricity cost)		0.4	1.2				

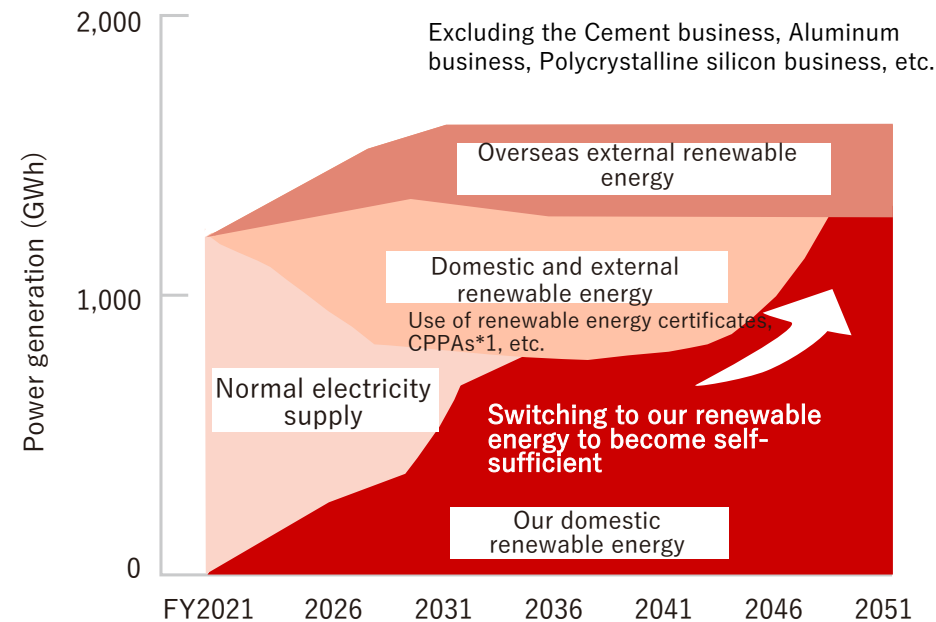
- Accelerate establishment of geothermal power development system and business expansion, with the aim of generating power equivalent to our electricity consumption in FY2051. Expand into new renewable energy generation, mainly wind power

- Achieve 100% of electricity from renewable energy in real terms in FY2036. Achieve renewable energy generation equivalent to our electricity consumption and achieve 100% self-sufficiency in renewable energy in real terms in FY2051.

Trends in our renewable energy generation



Composition of our electricity consumption



※1 CPPA (Corporate Power Purchase Agreement)

# Efforts Toward CN and Future Vision After CN

- Efforts toward FY2031 are becoming more precise through the compilation of GHG reduction plans and other measures.
- Toward FY2046, it is necessary to achieve carbon neutrality in the non-electricity portion. Drastic changes are needed in manufacturing processes, including fuel conversion (hydrogen, ammonia, carbon-neutral methane, etc.) while energy conservation is continued. Development and supply of products and technologies that contribute to a carbon-neutral society are carried out. Reduction will be promoted through the use of future external technologies such as CO<sub>2</sub> capture (solid adsorption, liquid absorption, permeate membrane separation) and treatment (storage and methanation).

	FY2024	2025	2026	2027	2031	2032	2046	Future vision after CN
Copper & copper alloy business and Electronic materials & components business	<ul style="list-style-type: none"> <li>● Study of fuel conversion options (Conceptual planning of quality testing and facility upgrades)</li> <li>● Study and demonstration of alternatives to fluorine-based cleaning solutions</li> </ul>			<ul style="list-style-type: none"> <li>● Demonstrations, etc.</li> <li>● Start using non-fluorine-based cleaning solutions</li> </ul>		Facility renewal		<ul style="list-style-type: none"> <li>● Carbon neutralization of heating furnaces (Hydrogen, ammonia, etc.)</li> <li>● Electrification of facilities</li> <li>● 100% renewable electricity (stable procurement using in-house power)</li> <li>● Conversion to non-CFC air conditioning facilities</li> <li>● Non-fluorine-based cleaning solutions</li> <li>● Others (Future applicable external technologies)</li> </ul>
Metalworking Solutions business	Electrification of facilities					Further electrification, hydrogenation		
Smelting and resource recycling business	<ul style="list-style-type: none"> <li>● Switch from heavy oil to LNG and ammonia</li> <li>● Reduce fossil fuels through increased processing of e-scrap</li> <li>● Increase in-house power generation by installing solar power generation facilities and saturated steam turbines</li> </ul>					Renew fuel conversion facilities		
Renewable energy business	Understand trends toward use of non-CFC gases in electrical facilities					Conversion to non-CFCs		
Development of elemental and basic technologies	<ul style="list-style-type: none"> <li>● Understand the impact on products and facilities (laboratory tests)</li> <li>● R&amp;D of products and technologies that contribute to a carbon-neutral society</li> </ul>			<ul style="list-style-type: none"> <li>● Selection and demonstration of models, facilities and processes (Cooperate with Business Divisions)</li> <li>● R&amp;D of products and technologies that contribute to a carbon-neutral society</li> </ul>		<ul style="list-style-type: none"> <li>● Transfer of control over site</li> <li>● Practical application of technology</li> </ul>		
Companywide (GHG reduction investment in facilities and processes)	10.5 billion yen							

# Development of Carbon Dioxide Decomposition and Recycling Technologies

## R&D of technology to decompose carbon dioxide (CO<sub>2</sub>) and recycle it as carbon material

### Technical details

- Decomposition of CO<sub>2</sub> by activated reducing agent
- Recovery of nanocarbon and its application as a carbon source for various uses

### Features of this technology

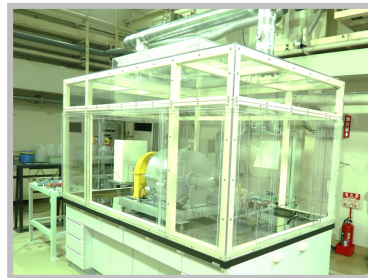
- Generates hydrogen in the process
- Recycling process enables reducing agents, etc. to be used repeatedly

Currently, principle verification and elemental research are completed using lab-scale test apparatus

In future, the plan is to use scaled-up bench-scale test apparatus to verify equipment performance and optimize reaction conditions

Aiming for practical application in around 2030.

This R&D was adopted in October 2021 by the New Energy and Industrial Technology Development Organization (NEDO) in the "Development of Carbon Material Manufacturing Technology by Chemical Decomposition of Carbon Dioxide" under the project "Development of technologies for carbon recycling, next-generation thermal power generation, etc./Development of practical technology for CO<sub>2</sub> emission reduction and effective utilization" (for five years starting in FY2022).



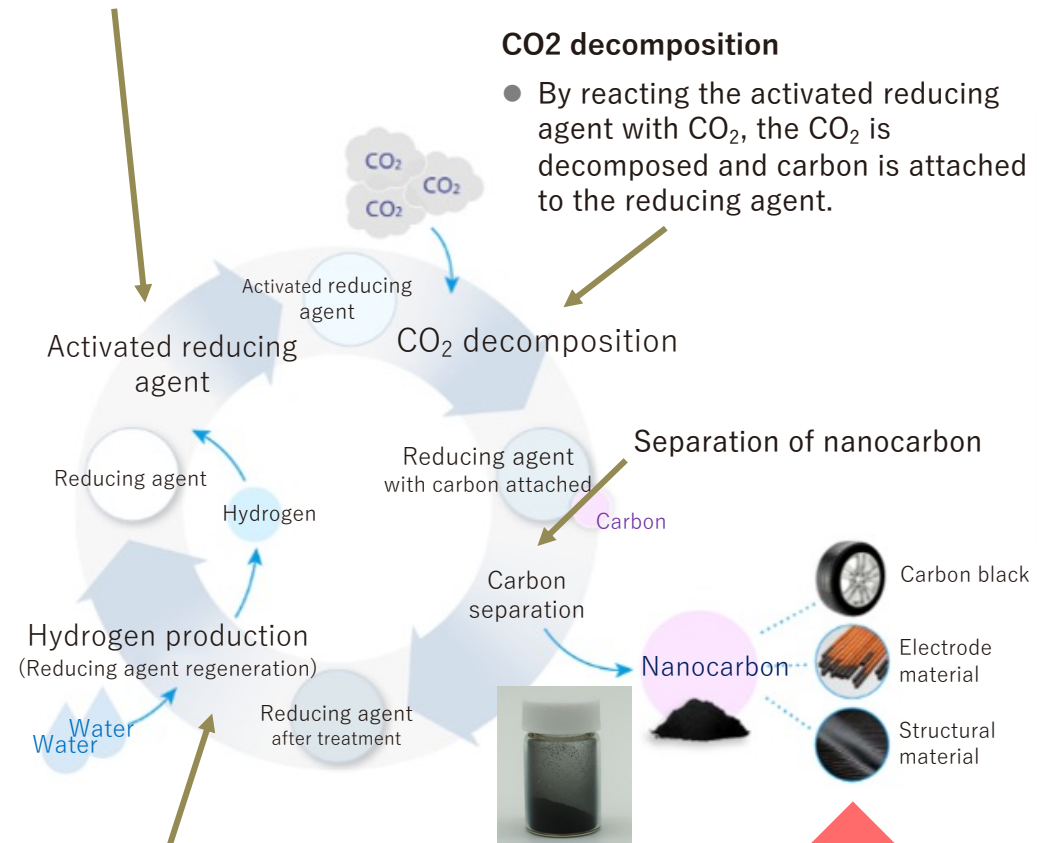
Reactor (Rotary Kiln Type)

Activated reducing agent

- Reducing agent (powdered metal oxide) activated by reaction with hydrogen

CO<sub>2</sub> decomposition

- By reacting the activated reducing agent with CO<sub>2</sub>, the CO<sub>2</sub> is decomposed and carbon is attached to the reducing agent.



Hydrogen production  
(Reducing agent regeneration)

Reducing agent after treatment

Hydrogen production

- Used reducing agents can be recycled, and hydrogen can be produced in the recycling process

Carbon black, battery materials, structural materials, etc.

Expected to have diverse applications

# Reference: History of GHG Reduction Targets (Scope 1 + 2)

**Review of company-wide GHG emissions (results and targets) due to business restructuring and future plans**

**1** March 26, 2021

**Company-wide targets were set, including Cement business**

**2** November 26, 2021

**Target values excluding Cement business**

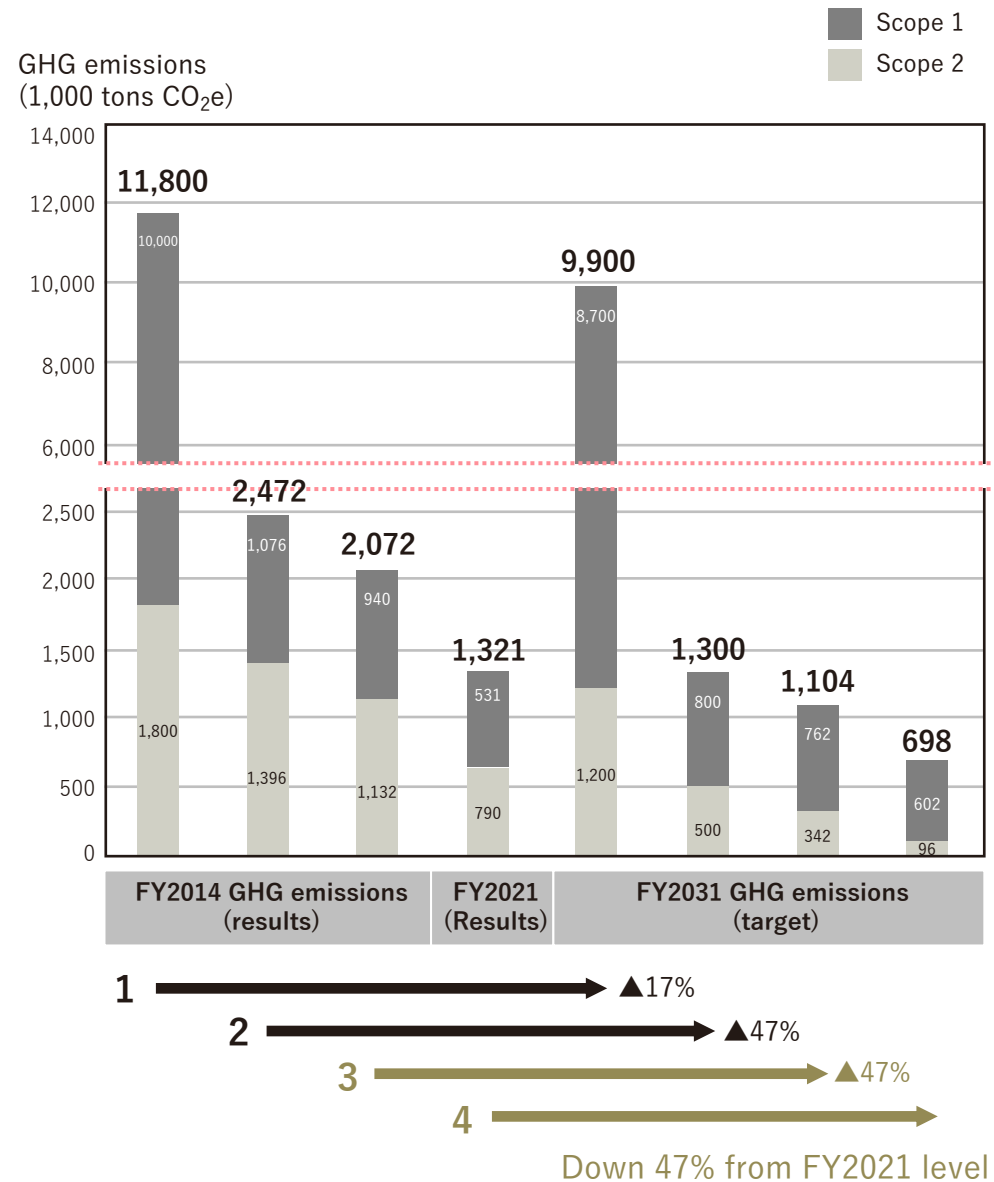
**3** July 29, 2022

**Target values excluding Cement business and Aluminum business**

**4** February 2023

**Target values excluding Cement business, Aluminum business, Polycrystalline silicon business  
(Assuming project scope from FY2024 at this time)**

\*The base year is changed from FY2014 results to FY2021 results in line with SBT certification process.

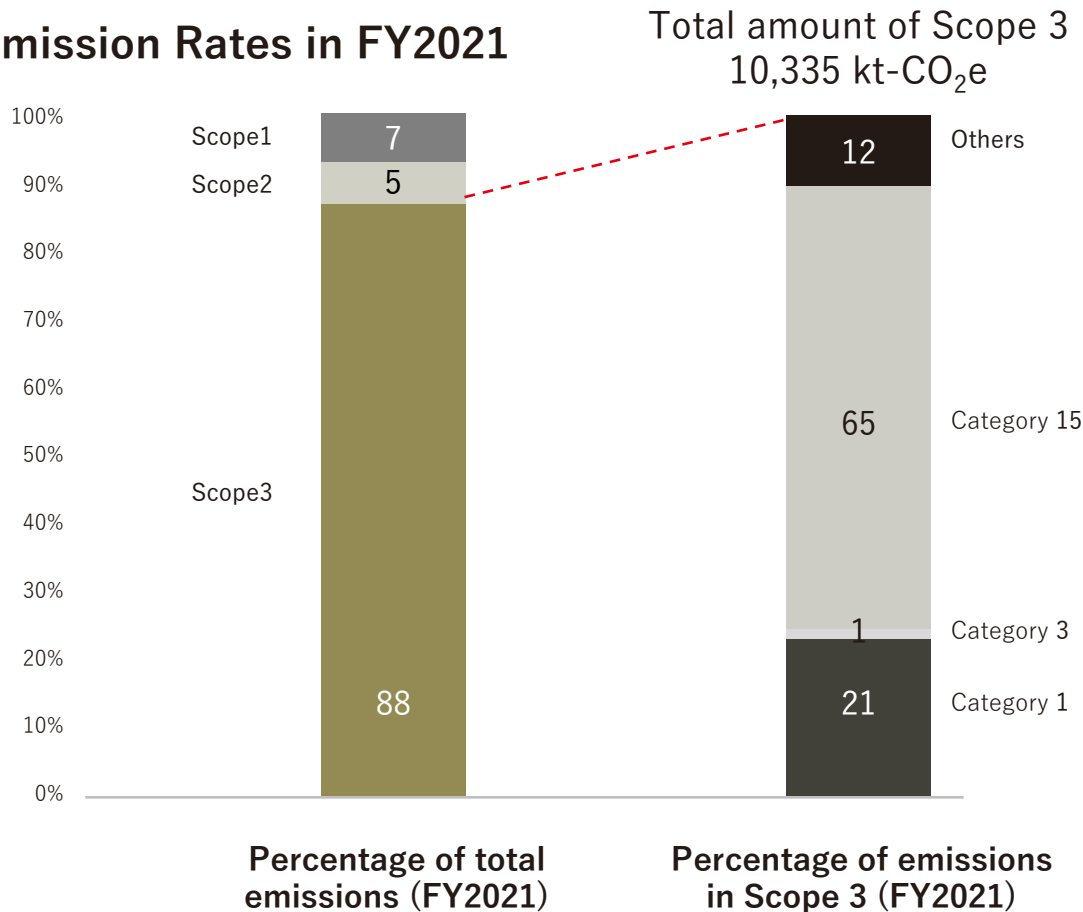




# (Reference) Scope 3: Reducing Emissions in the Supply Chain

- Based on the SBT certification application and assessment process, we set Scope 3 reduction targets including emissions from affiliates.
- Specifically, we aim to reduce categories 1, 3, and 15, which account for 88% of scope 3, by 13% or more (compared to FY2021) by FY2031.
- We will also work with suppliers of goods and services and other companies in which we have invested to reduce GHG emissions, including across supply chains other than our own.

## Emission Rates in FY2021



Categories 1, 3, and 15 account for the majority of Scope 3 emissions, which represent approximately 88% of our total emissions.

- ※ Category 1 Purchased goods and services
- Category 3 Fuel and energy related activities not included in Scope 1 or 2
- Category 15 Investments

\*Because MUCC is an equity-method company, only Scope 3 is included in our calculations. MUCC accounted for approximately 60% of total Scope 3 emissions in FY2021.

Carbon Neutral

**Responding to climate change risks and opportunities based on TCFD recommendations**

Participation in Initiatives

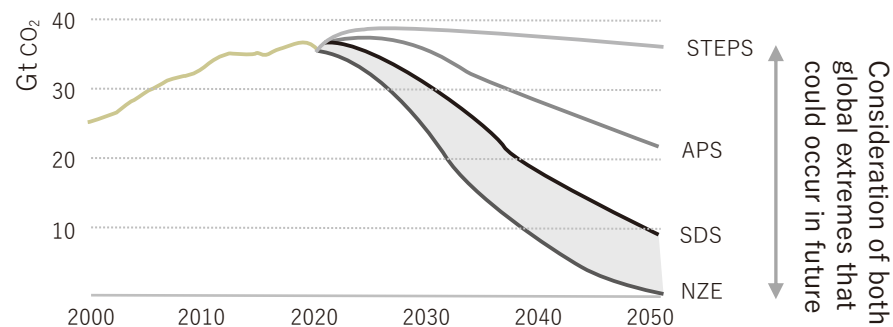
OECM Nature Coexistence Site

# Climate Change Scenarios Used in Scenario Analysis

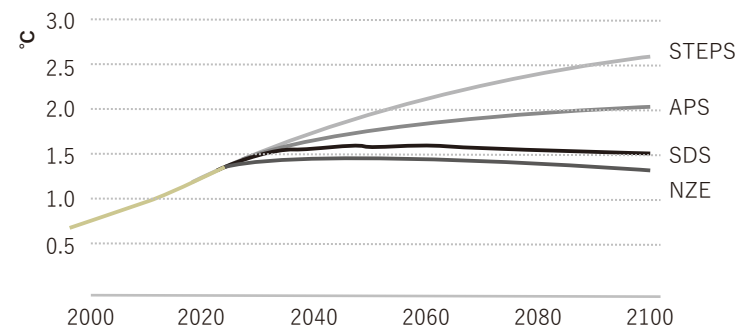
In this scenario analysis, the NZE and STEPS of IEA WEO 2021 were mainly used as climate change scenarios related to transition risks. The effects on business, finance, and strategy were analyzed for the world moving toward carbon neutrality by 2050 (1.5°C scenario) and the world on its present course (4°C scenario).

<p><b>STEPS</b> Stated Policies Scenario</p> <p style="border: 1px solid black; padding: 2px; display: inline-block;"><b>4 °C Scenario</b></p>	<p>This scenario reflects current policy settings based on the sector-specific assessment of specific policies currently in place or announced by governments around the world.</p>
<p><b>APS</b> Announced Pledges Scenario</p>	<p>This scenario assumes that all climate change commitments made by governments around the world, including nationally determined contributions (NDC) and long-term net zero targets, will be met fully and on time.</p>
<p><b>SDS</b> Sustainable Development Scenario</p>	<p>This scenario assumes that net zero emissions will be achieved globally by 2050 for developed countries, around 2060 for China, and no later than 2070 for all other countries.</p>
<p><b>NZE</b> Net Zero Emissions by 2050 Scenario</p> <p style="border: 1px solid black; padding: 2px; display: inline-block;"><b>1.5 °C Scenario</b></p>	<p>This scenario sets an achievable path for the global energy sector to achieve net zero CO<sub>2</sub> emissions by 2050.</p>

## ■ Annual changes in CO<sub>2</sub> emissions by scenario



## ■ Global median surface temperature increase over time by scenario



Source: Compiled from IEA WEO 2021

# Overview of MMC's Scenario Analysis Based on TCFD Recommendations

With regard to transition risks and opportunities related to climate change, we conducted scenario analysis for one theme across the company and for three major themes for each business (total of nine minor themes). The external and internal data used in the analysis were updated.

Scenario	Theme		Risk/Opportunity Elements	Impact on Business	Business
1.5°C Scenario / 4°C Scenario	Changes in Carbon Tax, Energy Costs, etc.		Introduction/strengthening of carbon price tax system (increase in operation costs)	Risk: Large	Common to all businesses
1.5°C Scenario	Changes in EV Demand	Changes in Product Demand Due to EV Shift	Increase in xEV sales volume	Opportunity: Large	Copper & copper alloy business
		Changes in Demand Related to Modal Shift and EV Shift	Rapid change in market for processed products due to modal shift, etc.	Risk: Medium	Metalworking Solutions business
		Changes in Demand for Copper Due to Progress in Responding to Climate Change	Increase in xEV sales volume	Opportunity: Large	Smelting and resource recycling business
		Changes in Demand Related to Automobile Recycling	Decrease in the number of scrapped vehicles	Risk: Small	Smelting and resource recycling business
	Changes in Forms of Energy Use	Changes in Demand Related to Batteries	Increase in demand for EV batteries and storage batteries	Opportunity: Large	Metalworking Solutions business
		Changes in Demand Related to LIB-R and PV-R	Increase in demand for automotive LIB and solar panel recycling	Opportunity: Large	Smelting and resource recycling business
		Changes in Demand for Renewable Energy	Increase in spread and demand for renewable energy	Opportunity: Large	Renewable energy business
	Changes in Demand for Recycling Business Due to Shift to Recycling-Oriented Society	Changes in Demand for E-scrap Recycling Business Due to Shift to Recycling-Oriented Society	Increase in demand for E-scrap recycling	Opportunity: Medium	Smelting and resource recycling business
		Changes in Demand Related to Home Appliance Recycling	Increase in demand for home appliance recycling	Opportunity: Medium	Smelting and resource recycling business

※ New themes written in red

# Changes in Carbon Tax, Energy Costs, etc. (Common to all Businesses)

- Risk factor: Introduction/strengthening of carbon price tax system (increase in operation costs)

## Anticipated world and business impact

Increase in production costs due to introduction/strengthening of carbon price system

- Higher taxation on GHG emissions and increased energy costs due to higher electricity prices
- Increased green power certificate procurement amounts and emissions trading costs
- FY2031 CP estimated to be approximately 6-12 billion yen, and energy cost increase from FY2021 estimated to be 7.3-8.2 billion yen

## Impact analysis

Carbon prices will be a factor in increasing our costs. The impact of carbon prices on society as a whole is a risk that will result in lower revenue if GHG emissions reductions are delayed or not passed on to our product prices.

Business  
impact  
assessment



**Risk: Large**

## Indicator

Group GHG emissions  
(Scope1,2)

## Target


- 47% reduction in emissions by FY2031 (compared to FY2021)
- Achieve carbon neutrality by FY2046

## Future strategies and responses

- Formulate a plan to reduce GHG emissions by FY2031, reduce energy consumption by improving the efficiency of facilities and processes, electrify processes and switch fuels, and switch to electricity derived from renewable energy sources (renewable energies).
- Switch 100% of our Group's electricity use to renewable energy-derived electricity by FY2036
- Accelerate the long-term use of CN fuels and the development of innovative technologies such as the capture and utilization of CO<sub>2</sub>

# Changes in Product Demand Due to EV Shift (Copper & Copper Alloy Business)

## ● Opportunity factor: Increase in xEV sales volume

<b>Anticipated world and business impact</b>	<p><b>Rapid growth in demand for EV-related products for decarbonization</b></p> <ul style="list-style-type: none"> <li>● Overall automobile sales will increase toward FY2031, and demand for connectors and bus bars for automobiles will increase 2.6 times by FY2031 and 3.1 times by FY2051 compared to FY2021.</li> <li>● Sales volume of xEVs is expected to increase approximately 24-fold by FY2031 compared to FY2021.</li> </ul>		
<b>Impact analysis</b>	<p>A significant increase in sales of xEVs, which use more copper products, is expected to <b>significantly lift demand for our rolled copper products</b>. This will be an <b>opportunity to expand sales</b> by strengthening production of related products and capturing demand.</p>		<p>Business impact assessment  <b>Opportunity : Large</b></p>
<b>Indicator</b>	Sales of pure copper strips for vehicles	<b>Target</b>	End of FY2031 Double (compared to FY2021)
<b>Future strategies and responses</b>	<ul style="list-style-type: none"> <li>● In order to build a supply system that can meet the rapidly growing demand for products for EVs, increase our production capacity of copper components by at least 1.3 times by FY2031 compared to FY2021 (Production capacity is being increased at Japanese production sites)</li> <li>● Contribute to the transition to a decarbonized society by developing products with higher performance and lower environmental impact</li> </ul>		

# Changes in Demand Related to Modal Shift and EV Shift (Metalworking Solutions Business)


- Risk factors: Rapid change in market for processed products due to modal shift, etc.

<p>Anticipated world and business impact</p>	<p>Decrease in demand for cutting tools for engines due to increase in EV ratio</p> <ul style="list-style-type: none"> <li>● Significant increase in xEV sales and increased use of lightweight materials</li> <li>● Production of engine-powered vehicles is projected to decline (FY2031 level estimated at 0.59 times the FY2021 level), resulting in lower sales of cutting tools for engines and transmissions</li> </ul>		
<p>Impact analysis</p>	<p>The projected increase in demand for tools for difficult-to-machine materials due to the growth of markets related to electrification and weight reduction may provide <b>opportunities to expand sales by reviewing the product mix and tapping into demand.</b> On the other hand, there is <b>a risk that sales of cutting tools for engine-powered vehicles, a current mainstay product, will decline.</b></p>		
<p>Indicator</p>	<p>Sales of cutting tools</p>	<p>Target</p>	<p>End of FY2031 2.3 times (compared to FY2021)</p>
<p>Future strategies and responses</p>	<ul style="list-style-type: none"> <li>● Contribute to the transition to a decarbonized society by developing and supplying products such as tools for machining difficult-to-machine materials to meet growing demand in the 1.5° C scenario, and expanding our global market share.</li> <li>● In the automotive product market, we will closely monitor the trend toward EVs and develop tools for processing EV parts as necessary. In the new markets that will replace the automotive industry, we also aim to increase sales of cutting tools by targeting the small precision machining field (robots, semiconductor manufacturing equipment, telecommunications, etc.) as a strategic market.</li> </ul>		

Business impact assessment  
  
**Risk: Medium**

# Changes in Demand for Copper Due to Progress in Responding to Climate Change (Smelting and Resource Recycling Business)

## ● Opportunity factor: Increase in xEV sales volume

<b>Anticipated world and business impact</b>	<p>Rapid growth in copper demand due to increased EV sales aimed at decarbonization</p> <ul style="list-style-type: none"> <li>● Overall automobile sales will increase toward FY2031, and copper requirements will increase 3.3 times by FY2031 and 4.6 times by FY2051 compared to FY2021.</li> <li>● Sales volume of xEVs is expected to increase approximately 24-fold by FY2031 compared to FY2021.</li> </ul>		
<b>Impact analysis</b>	<p>A significant increase in sales of xEVs, which use more copper, is expected to <b>significantly lift global copper demand</b>. This will be an <b>opportunity to increase sales</b> by capturing demand through the expansion of our electrolytic copper production capacity.</p>		<p>Business impact assessment    <b>Opportunity : Large</b></p>
<b>Indicator</b>	Electrolytic copper sales volume	<b>Target</b>	End of FY2031 830,000 t
<b>Future strategies and responses</b>	<ul style="list-style-type: none"> <li>● To meet growing copper demand, we will invest in facilities at our domestic bases and increase our copper ore processing volume by 1.3 times (Naoshima) and electrolytic copper sales volume by 1.4 times (overall business) from the current levels by FY2031. This stable supply of electrolytic copper will contribute to the transition to a decarbonized society.</li> </ul>		



New

# Changes in Demand Related to Automobile Recycling (Smelting and Resource Recycling Business)

## ● Risk factor: Decrease in the number of scrapped vehicles

<p><b>Anticipated world and business impact</b></p>	<p><b>Decrease in the number of scrapped vehicles due to the decline in the Japanese population and the advance of car sharing in a decarbonized society</b></p> <ul style="list-style-type: none"> <li>● Due to the declining population in Japan and the decrease in sales volume resulting from the advance of car sharing, the number of scrapped automobiles in Japan will remain almost flat in FY2031 compared to FY2021, and will decrease by about 0.85 times by FY2051.</li> <li>● The overall number of vehicles processed will decrease, but the percentage of next-generation vehicles will increase (18% by FY2031 and 78% by FY2051).</li> </ul>
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<p><b>Impact analysis</b></p>	<p>The number of vehicles processed in Japan is expected to decline, and there is a risk that automobile recycling sales will decline.</p>	<p>Business impact assessment ↓ <b>Risk: Small</b></p>
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<p><b>Indicator</b></p>	<p>Annual no. of vehicles processed</p>	<p><b>Target</b></p>	<p>End of FY2031 70,000 units</p>
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<p><b>Future strategies and responses</b></p>	<ul style="list-style-type: none"> <li>● Aim to increase sales by expanding our market share, on the strength of our efficient processing technology for next-generation automobiles utilizing technology accumulated in the home appliance recycling business</li> <li>● As a processing base for next-generation automobile recycling, we will increase our processing capacity by utilizing alliances in current technology demonstrations, etc., and expanding the number of sites to a total of three.</li> <li>● Contribute to the realization of a recycling-oriented society by meeting resource recycling needs through automobile recycling</li> </ul>
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# Changes in Demand Related to Batteries (Metalworking Solutions Business)

- Opportunity factor: Increase in demand for EV batteries and storage batteries


<p>Anticipated world and business impact</p>	<p>Growing demand for tungsten powder due to increase in EV batteries and stationary storage batteries</p> <ul style="list-style-type: none"> <li>● Demand for EV batteries is projected to grow 21-fold by FY2031 and 30-fold by FY2051 compared to FY2021 due to increased sales of BEVs and PHEVs.</li> <li>● Growing demand for renewable energy is expected to lead to an approximately 20-fold increase in stationary storage battery installations by FY2031 and a 22-fold increase by FY2051, compared to FY2021.</li> </ul>		
<p>Impact analysis</p>	<p>The growing demand for EVs and the rapid increase in demand for storage batteries are expected to <b>significantly increase demand for high-performance powders for rechargeable batteries</b>. This will be an <b>opportunity to increase sales</b> by capturing demand through the expansion of our production capacity for tungsten-based high-performance powder.</p>		<p>Business impact assessment  <b>Opportunity : Large</b></p>
<p>Indicator</p>	<p>Production of high-functional powder for rechargeable batteries</p>	<p>Target</p>	<p>End of FY2031 1.9 times (compared to FY2021)</p>
<p>Future strategies and responses</p>	<ul style="list-style-type: none"> <li>● Contribute to the transition to a decarbonized society by developing and supplying products to meet growing demand in the 1.5° C scenario, such as tungsten powder products for LIBs for EVs and LIBs for solar power generation equipment.</li> <li>● Expand our tungsten powder product business in cooperation with Masan High-Tech Materials.</li> <li>● Contribute to the realization of a recycling-oriented society by promoting tungsten recycling</li> </ul>		

New

# Changes in Demand Related to LIB-R and PV-R (Smelting and Resource Recycling Business)

- Opportunity factor: Increase in demand for automotive LIB and solar panel recycling

<p><b>Anticipated world and business impact</b></p>	<p><b>Increase in recycling demand due to emissions of automotive LIBs and PVs</b></p> <ul style="list-style-type: none"> <li>● Considering the reuse of LIBs generated from scrapped xEVs, the recycling volume is expected to increase approximately 50-fold by FY2031 and more than 350-fold by FY2051, compared to FY2021.</li> <li>● Considering the reuse of solar panels, the recycling volume is expected to increase approximately eight-fold by FY2031 and more than 300-fold by FY2051, compared to FY2021.</li> </ul>
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<p><b>Impact analysis</b></p>	<p>Due to increased demand for EVs and solar power generation, it is anticipated that the <b>emissions of automotive LIBs and PVs will increase</b> in the future, and that the <b>demand for recycling will increase accordingly</b>. This will be an <b>opportunity to increase sales</b> by promoting commercialization based on demonstration tests currently underway.</p>	<p>Business impact assessment  <b>Opportunity : Large</b></p>
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<p><b>Indicator</b></p>	<p>Amount of automotive LIBs recycled*</p>	<p><b>Target</b></p>	<p>End of FY2031 870t-LIB</p>
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<p><b>Future strategies and responses</b></p>	<ul style="list-style-type: none"> <li>● Commercialize PV recycling to broaden the scope of target items at home appliance recycling sites</li> <li>● Contribute to the realization of a recycling-oriented society by developing automobile and LIB recycling sites in each region, and by working to upgrade and streamline recycling technologies</li> </ul>
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\* Up until creation of black mass (LIB removal, discharging, dismantling, pyrolysis, crushing and sorting)

# Changes in Demand for Renewable Energy (Renewable Energy Business)

## ● Opportunity factor: Increase in spread and demand for renewable energy

<p>Anticipated world and business impact</p>	<p><b>Medium- and long-term expansion of the renewable energy market toward a net-zero society</b></p> <ul style="list-style-type: none"> <li>● Demand for renewable energy is expected to keep growing, with Japan's geothermal and wind power generation projected to increase 4.7-fold and 9.8-fold, respectively, by FY2031 and 15-fold and 48-fold, respectively, by FY2051, compared to FY2021.</li> <li>● Environmental value ranges from 0.3 yen to 4 yen/kWh depending on the spread of renewable energy and supply and demand.</li> </ul>		
<p>Impact analysis</p>	<p>While the unit price of electricity sold and the price of non-fossil certificates fluctuate according to environmental policies and technological advances, <b>the demand for renewable energy itself will grow, especially for wind and geothermal power generation.</b> Investigating and developing new power generation sites will provide an <b>opportunity to expand our Renewable energy business.</b></p>		<p>Business impact assessment    <b>Opportunity : Large</b></p>
<p>Indicator</p>	<p>Our share of renewable energy sales</p>	<p>Target</p>	<p>End of FY2031 575GWh</p>
<p>Future strategies and responses</p>	<ul style="list-style-type: none"> <li>● Work to improve profitability through stable operation of existing power plants and utilization of environmental values, etc.</li> <li>● Focus on investigation and development of new power generation sites (development of new geothermal projects in the Hachimantai district and other regions, and entry into wind power generation)</li> <li>● Aim to expand the scale of power generation and related businesses through collaboration with other companies</li> </ul>		


# Changes in Demand for E-scrap Recycling Business Due to Shift to Recycling-Oriented Society (Smelting and Resource Recycling Business)

## ● Opportunity factor: Increase in demand for E-scrap recycling

<p><b>Anticipated world and business impact</b></p>	<p><b>Increase in demand for recycling waste electronic equipment in line with economic growth in each country</b></p> <ul style="list-style-type: none"> <li>● Estimated global E-scrap generation, based on global GDP growth and population change, will increase 1.4 times by FY2031 and 2.5 times by FY2051 compared to FY2021.</li> <li>● Despite the risk of a decrease in the amount of valuable metals recovered due to a decline in the grade of valuable metals in E-scrap, the amount of valuable metals recovered when we process 240,000 tons of E-scrap will be 1.9 times the FY2021 level.</li> </ul>		
<p><b>Impact analysis</b></p>	<p>Global E-scrap generation in FY2031 will be 1.4 times higher than in FY2021. There is a risk of a decline in the grade of valuable metals in E-scrap leading to a decrease in the amount recovered, and a risk of difficulties in collecting E-scrap due to successive entries into the E-scrap market by competitors and international moves to lock in resources. However, <b>increasing our recycling capacity</b> will increase our E-scrap processing volume and provide an <b>opportunity to increase our sales</b>.</p>		<p>Business impact assessment ↑ <b>Opportunity : Medium</b></p>
<p><b>Indicator</b></p>	<p>E-scrap processing capacity</p>	<p><b>Target</b></p>	<p>End of FY2031 240,000 t</p>
<p><b>Future strategies and responses</b></p>	<ul style="list-style-type: none"> <li>● To meet the growing demand for recycling due to the increased amount of E-scrap generated, enhance E-scrap processing capacity by constructing a recycling yard and strengthening the system for efficiently recovering the trace elements in E-scrap.</li> <li>● Enhance the functions of the Mitsubishi Materials E-Scrap Exchange (MEX) platform for E-scrap trading to improve customer convenience and increase E-scrap collection, thereby contributing to the creation of a recycling-oriented society.</li> </ul>		

# Changes in Demand Related to Home Appliance Recycling (Smelting and Resource Recycling Business)

## ● Opportunity factor: Increase in demand for home appliance recycling

<p><b>Anticipated world and business impact</b></p>	<p>Increased frequency of replacement with more energy-efficient appliances due to global warming and rising energy costs</p> <ul style="list-style-type: none"> <li>● The total weight of waste home appliances disposed of in Japan will increase 1.1 times by FY2031 and FY2051 compared to FY2021, due to an increase in the number of air conditioners owned per household, changes in the number of households, changes in the frequency of replacement due to breakdowns, and changes in the rate of home appliance collection due to recycling regulations, etc.</li> </ul>		
<p><b>Impact analysis</b></p>	<p>The amount of waste home appliances is expected to increase due to rising temperatures, changes in the number of households, and stricter carbon and recycling regulations. This will result in an increase in our appliance processing volume, which, based on our business size projections, will provide an opportunity to increase sales by 1.4 by FY2031 compared to FY2021.</p>		<p>Business impact assessment    <b>Opportunity</b>  <b>: Medium</b></p>
<p><b>Indicator</b></p>	<p>Annual no. of home appliances processed</p>	<p><b>Target</b></p>	<p>End of FY2031 5.9 million units</p>
<p><b>Future strategies and responses</b></p>	<ul style="list-style-type: none"> <li>● Contribute to building a recycling-oriented society by expanding business through M&amp;A of existing plants and establishment of new RPs</li> <li>● In addition to automation and labor saving, we will differentiate ourselves by strengthening management through a cloud-based operation management system, and visualizing environmental value through LCA evaluations.</li> </ul>		

Carbon Neutral

Responding to climate change risks and opportunities based on TCFD recommendations

## Participation in Initiatives

OECM Nature Coexistence Site

# Participation in Initiatives

- Active participation in efforts to address climate change issues

## TCFD

TCFD is the Task Force on Climate-related Financial Disclosures, established by the Financial Stability Board (FSB) at the request of the G20 to examine climate-related information disclosure and how financial institutions should respond. In March 2020, we made a clear commitment to disclose our own efforts regarding climate-related risks and opportunities, and decided to endorse TCFD recommendations and participate in the TCFD consortium.

## CDP

CDP is a non-profit organization based in London, UK, which works with institutional investors to manage an international framework requiring companies with the highest market capitalization to disclose their climate change and water risk strategies, data, and other information. On an eight-point scale from A to D-, we received an "A-" rating in FY2023 for CDP Climate Change. We receive a maximum "A" rating for CDP Water Security for the first time, and were selected as an A-list company



## SBT

SBT is a greenhouse gas emission reduction target set by companies with target years 5 to 15 years ahead, consistent with the levels required by the Paris Agreement, and is intended to accelerate corporate action to address climate change. We have set ambitious goals to work with our suppliers to build a supply chain resilient to decarbonization, and applied for SBT accreditation in July 2022. As of February 2023, our application is under review.

## GX League

The GX League was established as a forum where companies actively engaged in GX (Green Transformation), together with government agencies, universities, public research institutions, financial institutions, and other players taking up the challenge of GX, can work as one to discuss the transformation of the entire economic and social system and put it into practice to create new markets. In April 2022, we expressed our support with the aim of playing a bigger role in creating a society with reduced carbon emissions.



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Participation in Initiatives

**OECD Nature Coexistence Site**

# OECM Nature Coexistence Site

## Participation in the 30 by 30 Alliance for Biodiversity

- Coalition of the willing established to achieve the international goal of halting and restoring biodiversity loss by 2030
- Our company registered as a participant in April 2022

30 by 30 Initiative



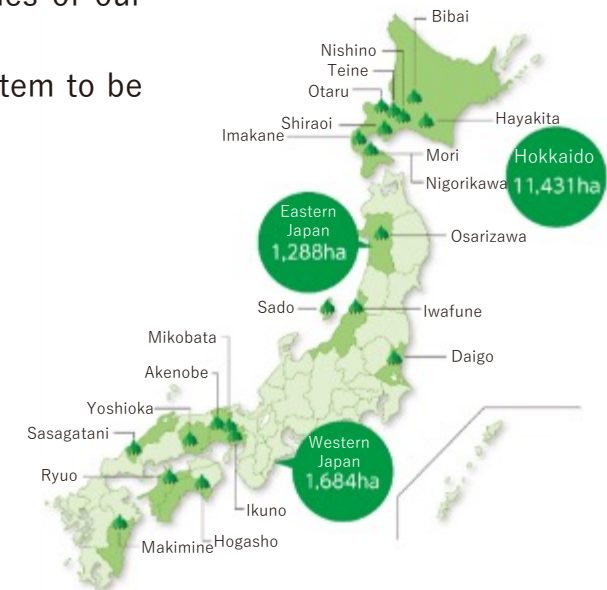
## Cooperation with the Ministry of the Environment's Nature Coexistence Site (tentative name) certification demonstration project\*

- Supporting the establishment of a certification system by providing examples of our efforts in the company-owned Materials' Forests, Teine Forest
- Aiming to obtain official certification for the Teine Forest in time for the system to be in place in FY2024

### Materials' Forests(14,000 ha)



Material no Mori, Teine Forest (Sapporo, Hokkaido)



\*The Nature Coexistence Site (tentative name) is scheduled to be launched in FY2024 as a system of certifying areas where biodiversity is being conserved through the efforts of the private sector etc. Demonstration projects are conducted for the purpose of identifying issues that may arise when the certification criteria and assessment process are put into actual operation in preparation for full-scale operation.

**For people, society and the earth,  
circulating resources for a sustainable future**