Mitsubishi Materials Corporation

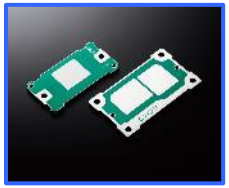
Business Segment IR Meeting

August 3, 2022

MITSUBISHI MATERIALS

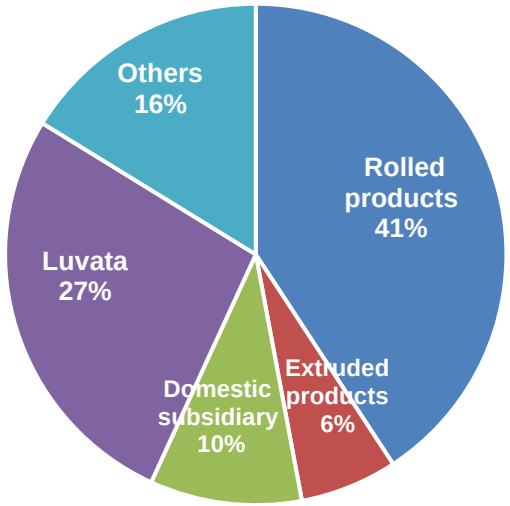
1. Advanced Products Company

Business Overview (Copper & Copper Alloy)

Key markets	Uses	Main product groups		Strengths
Automobiles Transport equipment	Terminal connectors	In-vehicle terminals Copper strips for busbars		High-performance copper alloy casting/processing technologies
		Plating		Development capabilities
	Automotive parts	ECO BRASS		Development capabilities
Semiconductors Electronics	Semiconductors	Lead frames		High-performance copper alloy casting/processing technologies
	Electronics	Heat sink copper strips		High-quality oxygen-free copper casting/processing technologies
Infrastructure Industrial equipment Medical equipment	Equipment parts	Copper rods Busbars		Oxygen-free copper/copper alloy casting and processing technologies
	MRI parts	Superconducting wires		Manufacturing/processing technologies

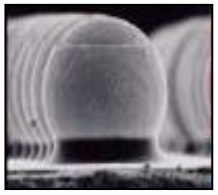
Sales composition and market outlook

2021 Results: Copper & Copper Alloy sales composition ratio



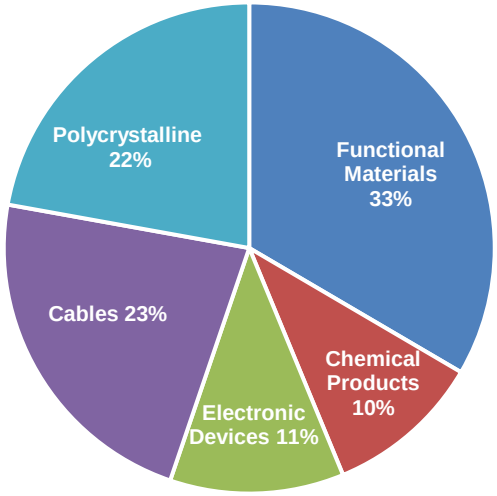
- Demand related to automobiles and semiconductors, the main markets for copper and copper alloy products, is expected to grow over the medium- to long-term due to the spread of next-generation vehicles and high-capacity telecommunications.
- At the same time, due to current supply chain turmoil and the situation in Ukraine, there are concerns of a slowdown in the production activities of major customers, and MMC will continue to look to the global situations and market environment.

Business Overview (Electronic Materials & Components)

Key markets	Uses	Main product groups		Strengths
Automobiles Transport equipment	Automotive glass interlayers	Heat-ray shielding paints		・Characteristic raw materials ・Dispersion technologies
	Automotive parts	Thermistor sensors		・Device development capabilities ・Customization capabilities (Injection molding technologies)
Semiconductors Electronics	Semiconductor element bonding materials	Low alpha solders		・Characteristic raw materials ・Evaluation technologies
	Semiconductor manufacturing equipment parts	Silicon processed products		・Material technologies ・Production processes (microfabrication technologies)
		Sealing products		・Material compounding technologies ・Custom shape designs ・Analysis/analytical technologies

Sales composition and market outlook

2021 Results: Electronic Materials & Components sales composition ratio



- In the automobile market, the ratio of next-generation automobiles to automobile production is expected to increase from 26% in FY2023 to 55% in FY2027.
- The semiconductor materials market, which is a focus market for electronic materials, is expected to grow at an average level of 10% even after FY2025, with ongoing expansion over the medium- to long-term.

Progress of the FY2023 Strategy | Priority Measures

Long-term goals | Global First Supplier

- Create new businesses and products through the sophistication and integration of our core competencies to realize the wants of society and customers
- Accelerate of marketing activities to replicate successful practice from a market perspective

Medium-term Management Strategy

- Enhancing marketing capabilities
- Planning and development of new products and creation of new businesses based on product roadmaps
- Expansion of global bases
- Strengthen manufacturing capabilities (standardize operations, establish mass production system)
- Key account strategy (to become a first-call vendor)
- Securing and developing excellent talent

	Key Measures for FY2023 Strategy	FY2022 Results	Plans for FY2023 and beyond
All businesses	Assignment of key account (KA) managers acting cross-sectionally (1)	**Established KA strategy activities**	**Improve** KA strategy activities **from customers and market perspectives**
	Digital Marketing Utilization	**Conducted technical exchange meetings and identified new projects** by utilizing digital marketing	**Promote the use** of digital marketing **in overseas markets**
	Development of new products and new businesses (2)	**Conducted discussions, etc. on each technical theme** with the customers' R&D departments	**Shift** from specific customer development themes **to prototype and mass production**
Copper & copper alloy	Business restructuring of the rolling and extrusion business and strengthening of production system (3)	Established a plan to install facilities for increased production Rolling: **Promoted start-up** of new slitting and packaging machines in Wakamatsu, and washing, slitting, and packaging machines in Sanpo **Promoted start-up of increased** copper mold production at Sakai Plant Extrusion: Reviewed **process streamlining**	No major changes to the plan Progress towards full-scale operations in 2023-2024
Electronic materials & components	Market development and sales expansion of products for next-generation vehicles (2)	**Built partnerships with key customers** and responded to their needs by utilizing the development roadmap for xEV components	**Design mass production process** for major automakers
	Establishment of system to increase production of silicon processed products (3)	Established a system to **increase production** to meet customer demand **and improved production efficiency**	**Establish a system to continuously increase production and improve production efficiency**

(1) KA Strategy Activities

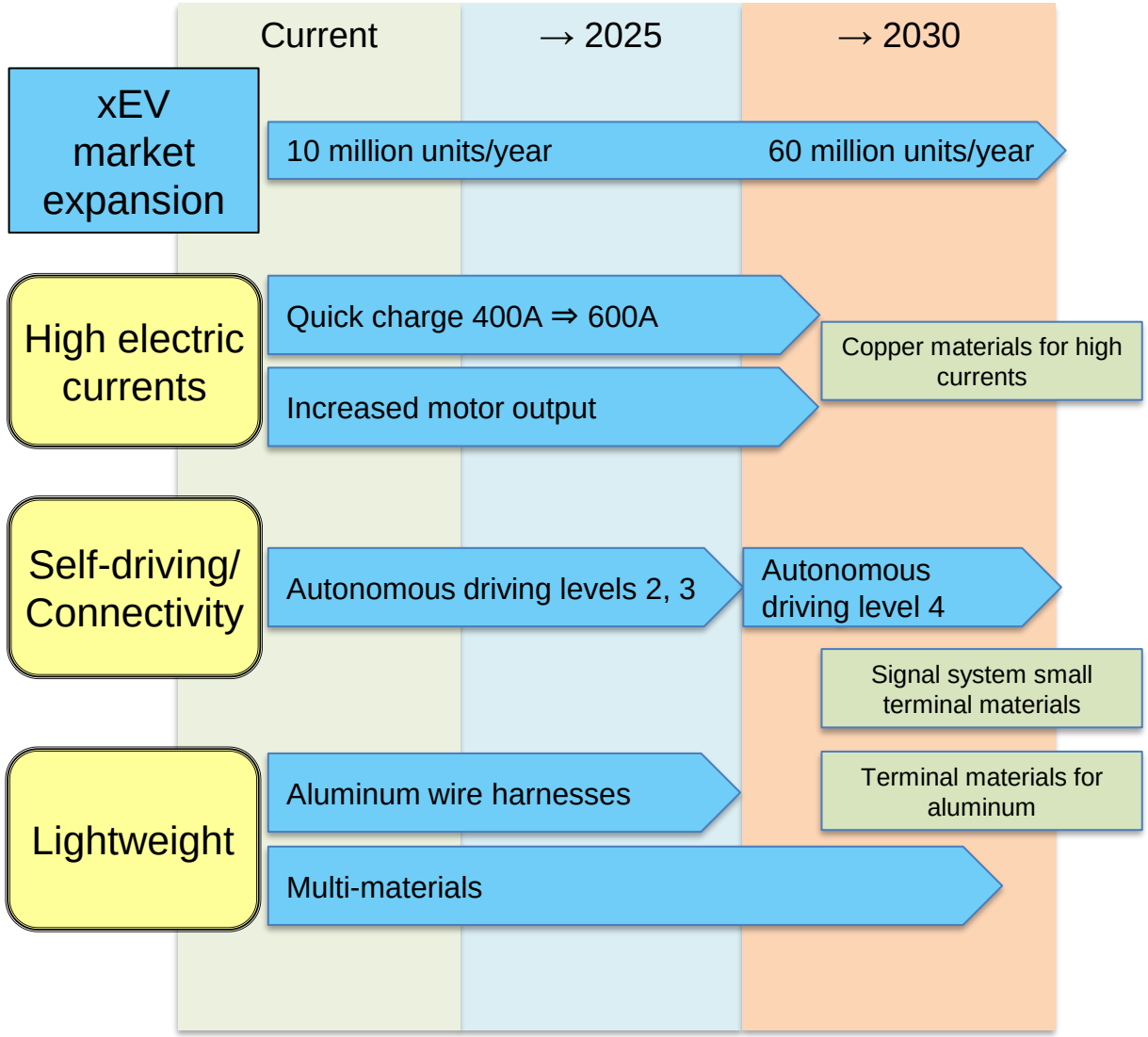
Activities up to now

- Sharing development roadmaps with KA from the design stage of next-generation products
- New product developments in line with future technology trends

Future activities

- Continue developments in line with roadmaps
- Improve customer satisfaction by introducing digital technologies (SFA/CRM) to further strengthen customer contact points

Example: Next-generation vehicle (xEV) roadmap (copper materials)



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(2) Development of New Products and Businesses

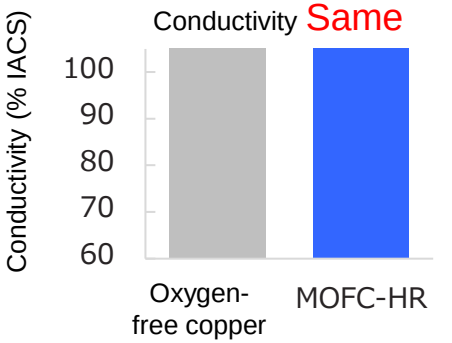
■ Oxygen-free copper MOFC-HR

Proprietary development of the world's highest level of strength and heat resistance

Minor degradation of characteristics even in environments with high thermal loads. **Ideal as component for electrical equipment requiring high currents and high heat dissipation under harsh environmental conditions,** especially for xEVs and next-generation energy.

Superior oxygen-free copper properties

Electrical conductivity/thermal conductivity



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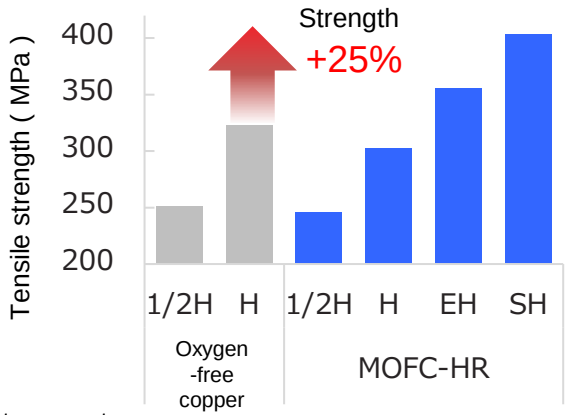
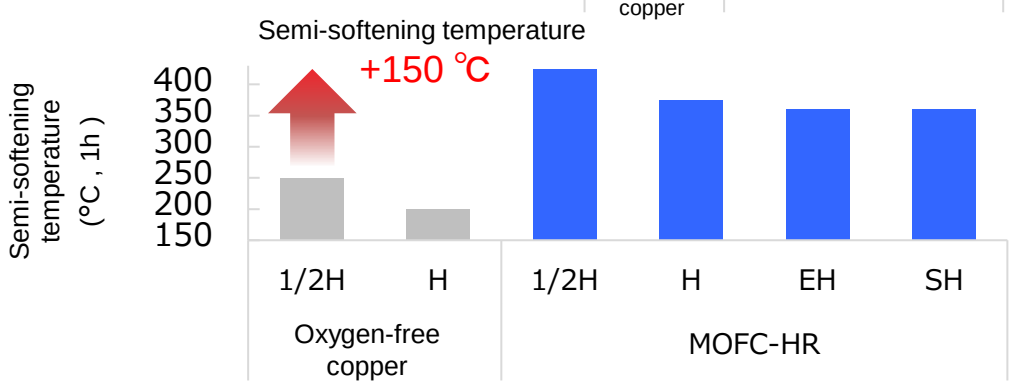
Copper alloy-grade high performance

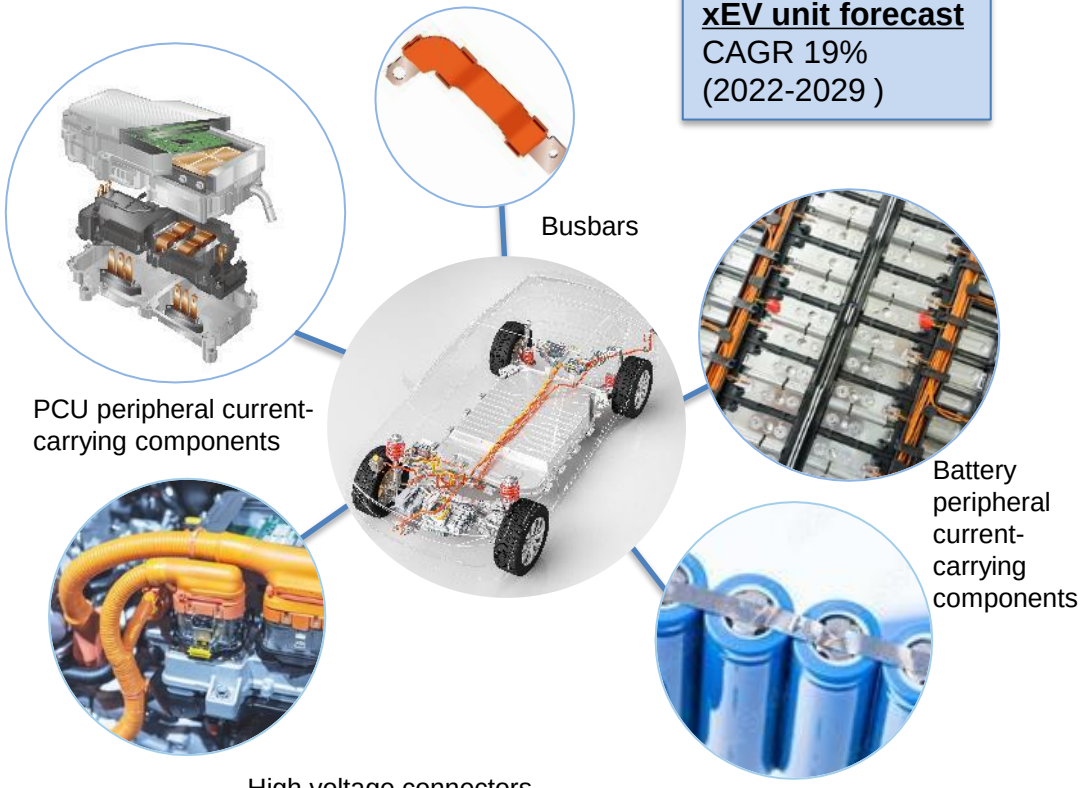
High strength and heat resistance





Examples of xEV Applications

xEV unit forecast
CAGR 19%
(2022-2029)



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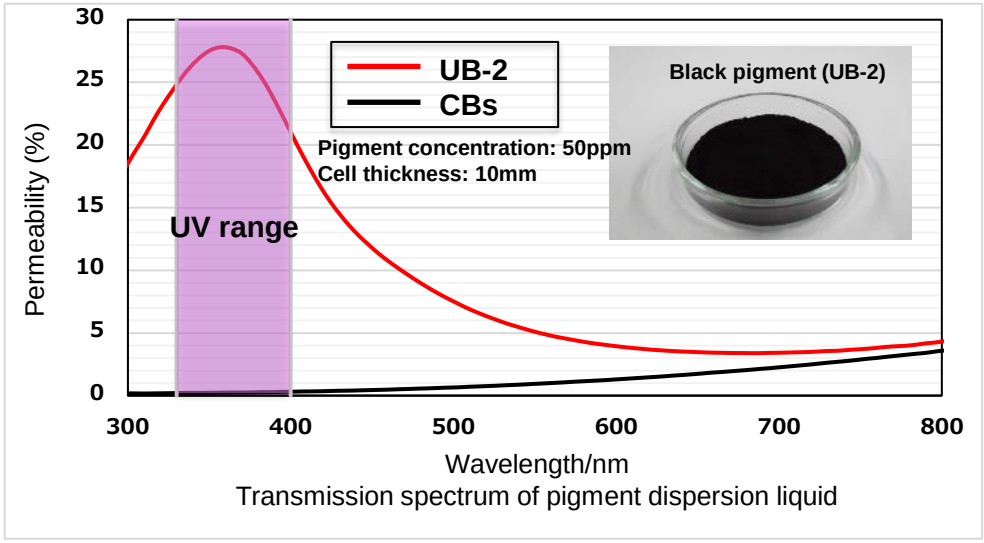
(2) Development of New Products and Businesses

■ High UV permeability black pigment NITRBLACK UB-2

Black pigment with the world's highest standard in high UV permeability

Facilitates UV curing of resin not possible with carbon black.



Transmission spectrum of pigment dispersion liquid

UV resin curing test results with 0.05wt% added to rabbit-shaped resin

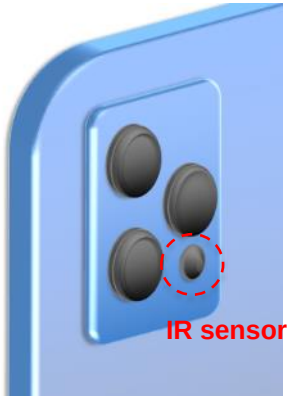
Carbon black (CB)	High UV permeability black pigment (UB-2)
	
● Insufficient curing ・Thin film formed only on surface ・Liquid inside	○ Complete curing UV permeates deep inside and resin is fully cured

Examples of NITRBLACK Applications

Black matrix for LCDs

Black matrix

<u>Black material market 520 million yen (2022)</u>
UB-2 is the world's first UV curable black pigment.



Light sheilding materials for camera modules, IR sensors, etc.

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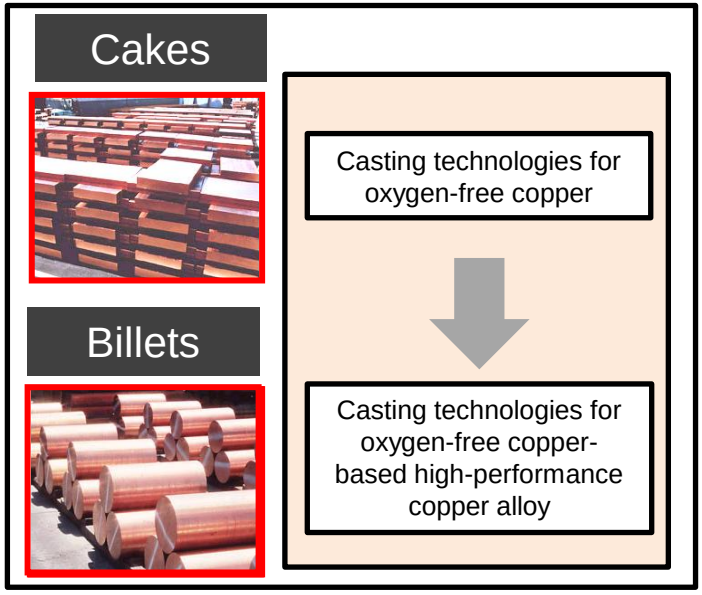
(3) Strengthening Production Systems (Increased Production)

Strengthening production systems for molded and rolled copper products

Increased production of molded copper (cast products)



Further strengthening of rolling business

Copper sheets and strips

Objective of increased production

- ◆Strengthen and expand core business (copper sheets and strips)
- ◆Further expansion of market share
- ◆Take on challenge of global markets

		Sakai Plant	Sambo Plant	Wakamatsu Plant
Location		Sakai, Osaka Prefecture	Sakai, Osaka Prefecture	Aizuwakamatsu, Fukushima Prefecture
Plan	Increased production	30% higher than current production		
	Investment purpose	Casting facility upgrades	Additional washing machines, slitters and packaging machines	Additional slitters and packaging machines, reflow tin plating line upgrades
	Schedule	To start operations in 2023	To start operations in 2024	To start operations in 2024*
Progress		Upgrades at all three plants proceeding according to plans		

Note: Upgraded reflow tin plating line to start operations in 2023.

(3) Strengthening Production Systems (Increased Production)

Strengthening Columnar Crystal Silicon Production System at Mitsubishi Materials Electronic Chemicals

Increased production of replacement parts components for semiconductor manufacturing equipment

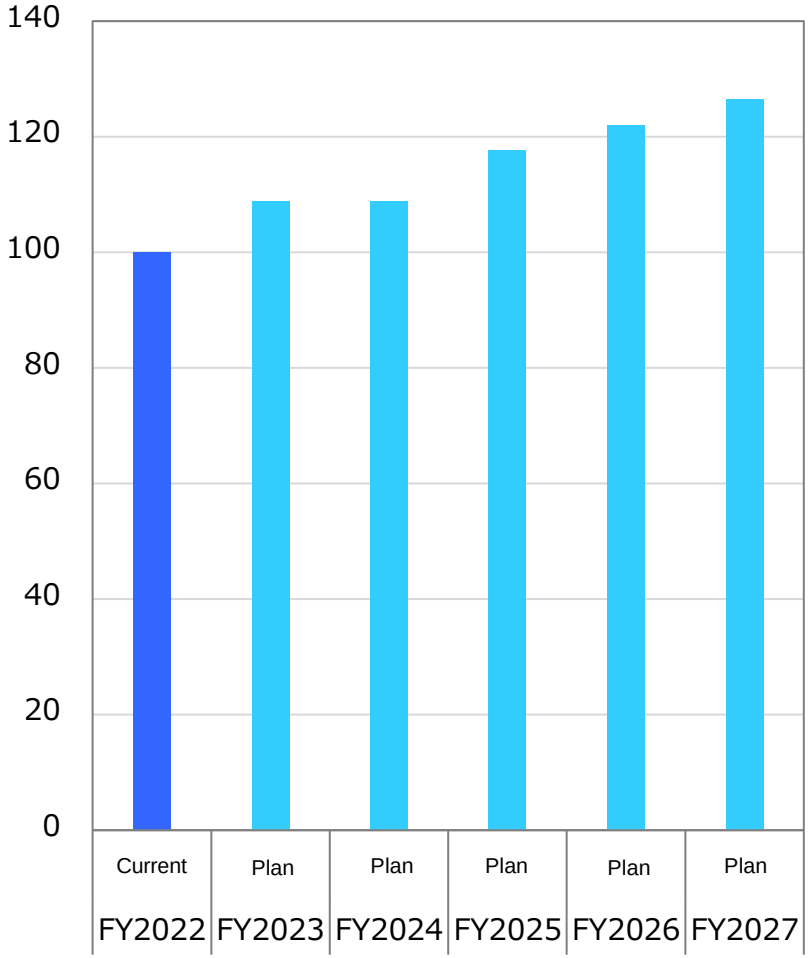
Columnar crystal silicon
(square ingot)

Ring-processed product
(semiconductor manufacturing equipment component)

- Among world's largest silicon crystals with maximum outer diameter of 1,200mm
- High purity and strength, with good thermal properties and processability
- Contamination prevented by use of same high-purity silicon in components as used in semiconductors
- Polycrystalline silicon with columnar crystal structure that is crystal-grown in one direction and solidified

		Mitsubishi Materials Electronic Chemicals
Location		Akita, Akita Prefecture
Plan	Increased production	Increase ingot production 1.3 times over current levels by 2026
	Investment purpose	Buildings, casting furnaces
	Schedule	To start operations in FY2025
Progress		Expansions proceeding as planned

Ingot production capacity
(Index with FY2022 = 100)



(3) Strengthening Production Systems (Increased Production)

Strengthening production systems in the seal products business

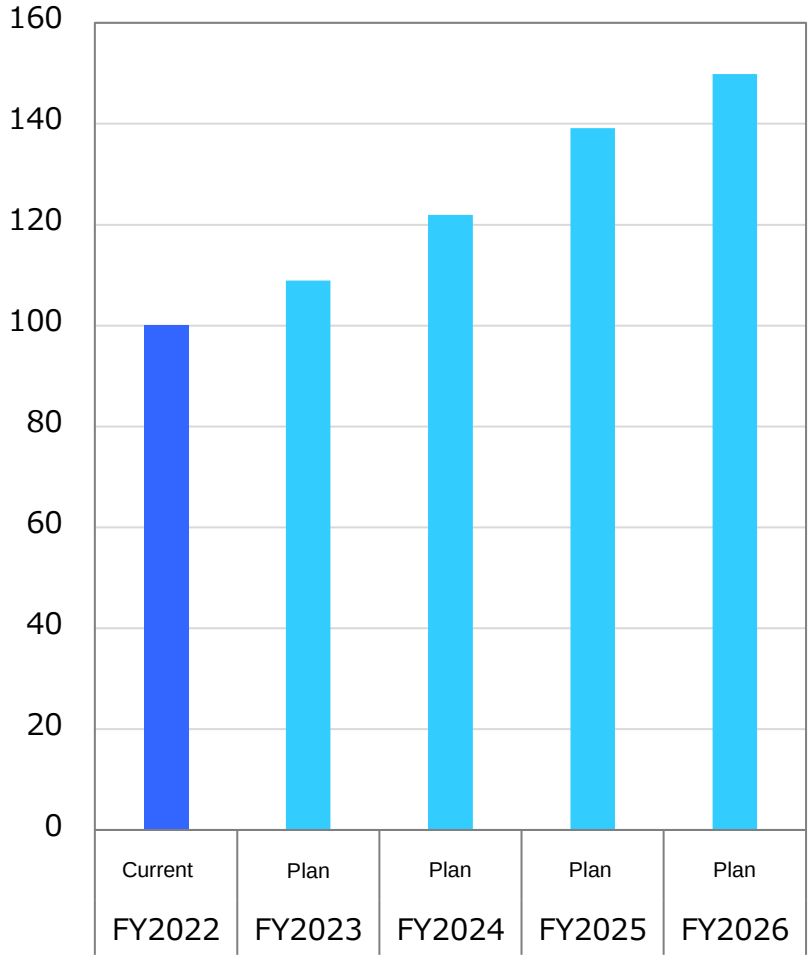
Increased production of sealing materials for semiconductor manufacturing equipment

- Sealing materials for semiconductor manufacturing equipment (plasma-resistant seals for dry etching equipment, etc.)
- Plasma-resistant, PFOA*-free

*Abbreviation for Perfluorooctanoic acid.
Content restricted by REACH regulations.

		Mitsubishi Cable Industries, Ltd., Kumagaya Office
Location		Kumagaya, Saitama Prefecture
Plan	Increased production	Approximately 1.5 times the current sales of products (above) in 2025
	Investment purpose	Existing building renovations, clean rooms
	Schedule	To start operations in FY2023
Progress		Expansions proceeding as planned

Production capacity on a sales basis (Index with FY2022 = 100)



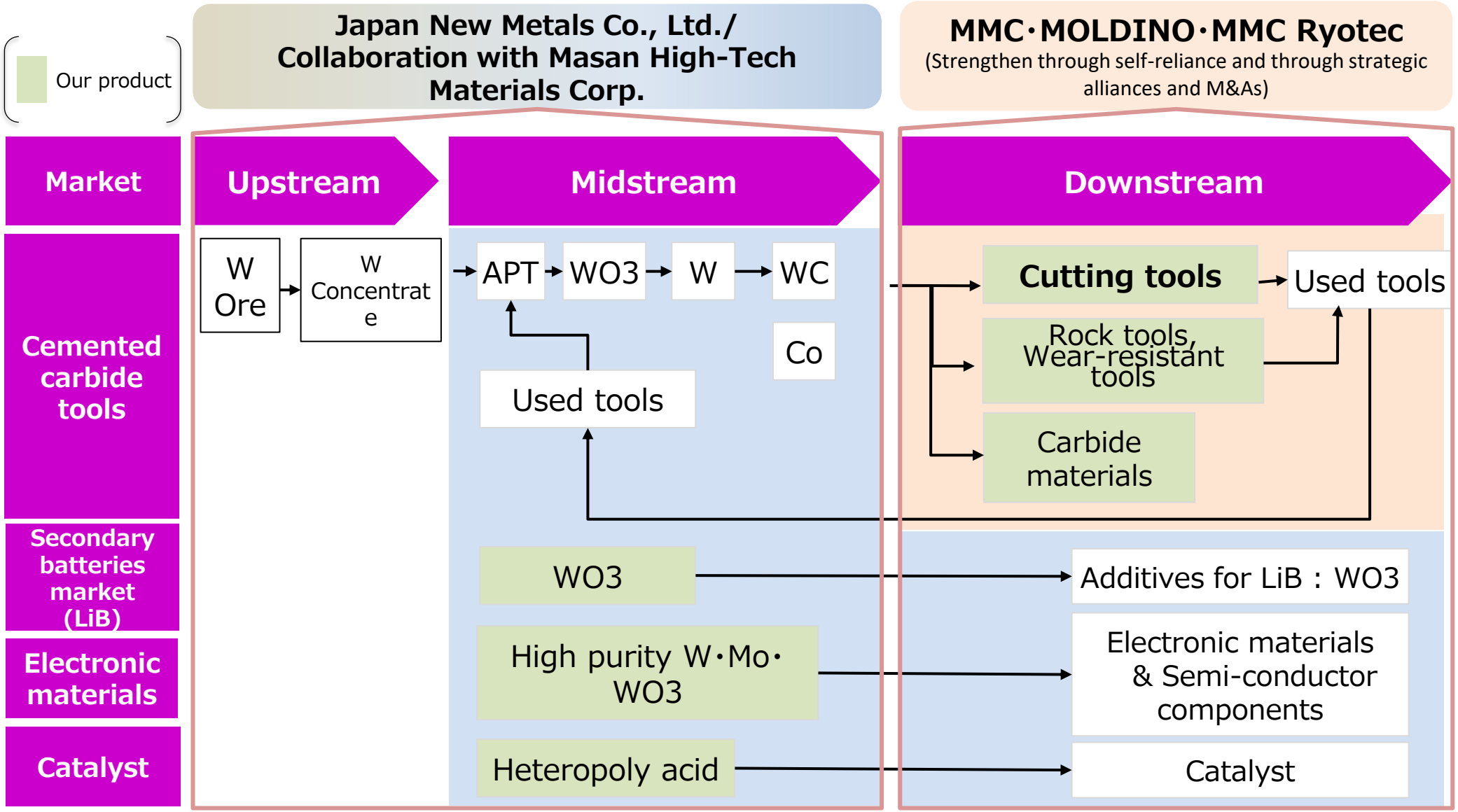
2. Metalworking Solutions Business Company

Metalworking Solutions Business Overview

Major industry	Main product group		Company	Strengths	Sales composition	Market outlook
Automobiles Transport equipment Aerospace Medical Die & Mold	Cutting tools		Mitsubishi Materials MOLDINO Tool Engineering	・Cemented carbide material manufacturing technologies ・Coating technologies (CVD/PVD) ・Extensive lineup (indexable tools to solid tools)	80%	・Despite concerns about the pandemic and global supply chain disruptions, the gradual recovery trend continues
Mine excavation Secondary batteries Steel	Rock tools Wear-resistant tools		MMC Ryotec	・Cemented carbide material manufacturing technologies ・Design capabilities as strength in wear-resistant and rock tools	11%	・Mine excavation, construction, and secondary battery markets all continue to recover
Cemented carbide Semiconductors Secondary batteries	Tungsten powder Advanced matal powder		Jan New Metals	・Integrated production, from tungsten recycling to smelting	9%	・Growing demand for high melting point materials due to the growth in electronic components

Metalworking Solutions Business Overview

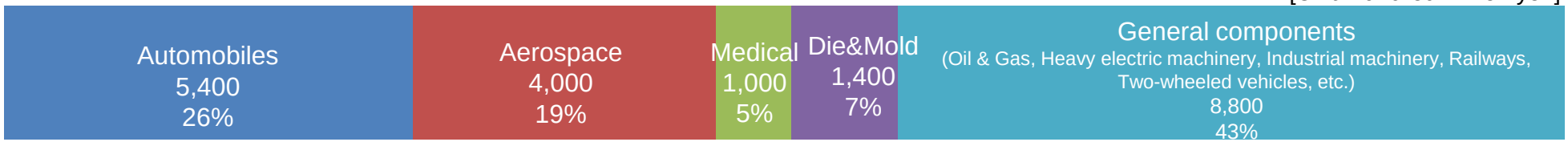
■ **Operate business from upstream to downstream areas, with the focus on downstream areas**



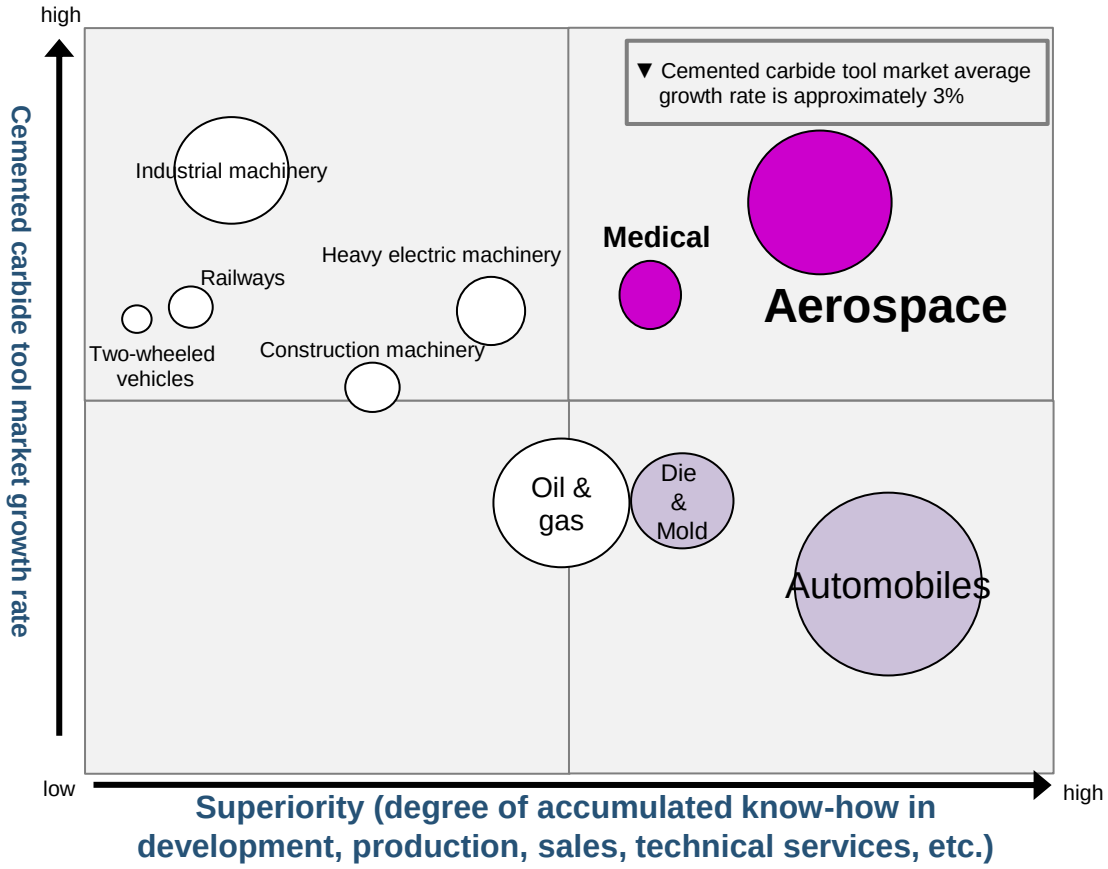
Cemented Carbide Cutting Tool Market Outlook

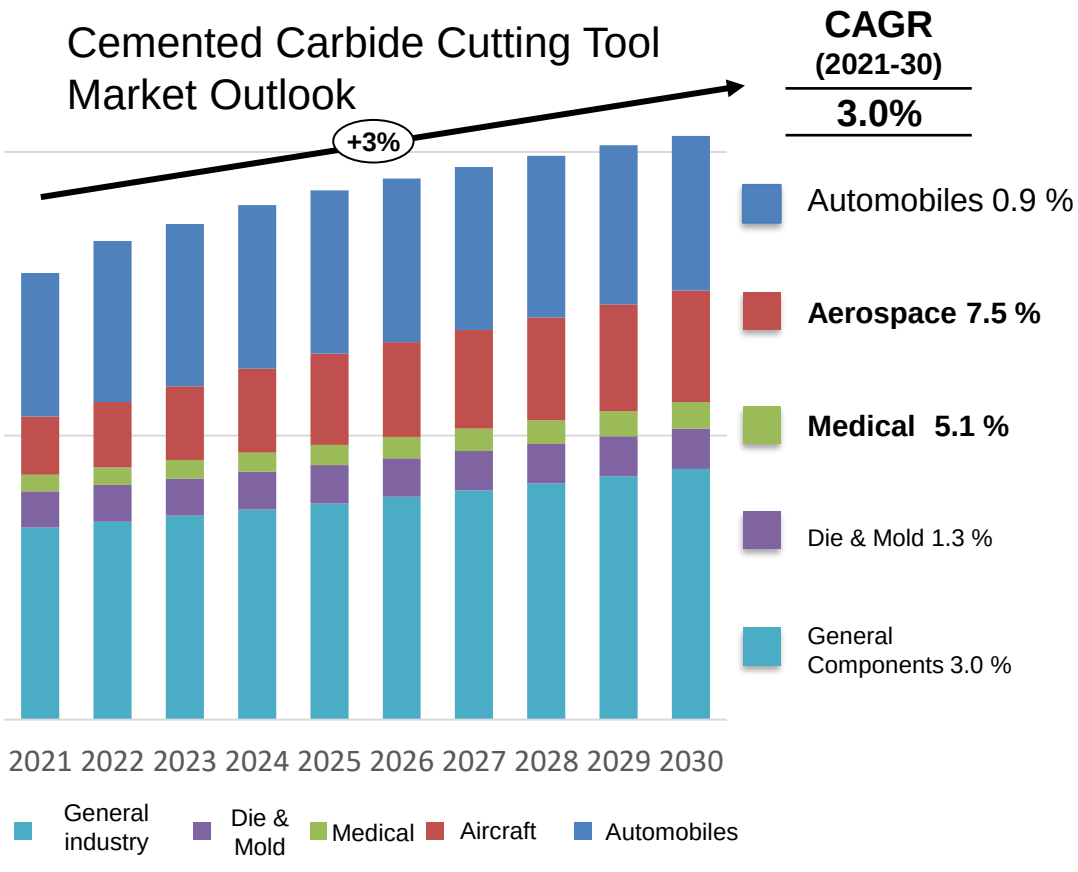
Demand for cemented carbide cutting tools is expected to grow at an annual rate of about 3%, reaching approximately 2.6 trillion yen per year in 2030. *1.57 trillion yen/year (2021)

[Unit: hundred million yen]



Note: Mitsubishi Materials estimate.





Note: Mitsubishi Materials estimate.

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Aerospace Industry: Market Trends and Growth Scenarios

Expand sales in North America and Europe by strengthening product competitiveness and manufacturing systems, aiming for sales growth of 10.0 billion yen (CAGR 12% or higher) by 2030.

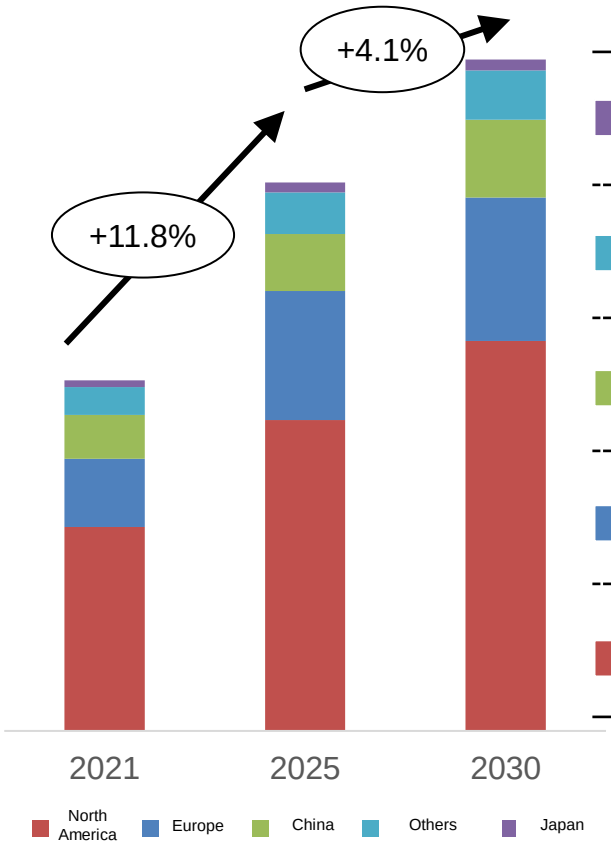
Strengthen product competitiveness

- ✓ Selecting target components by work material, thoroughly introduce new products (plans to introduce eight series and 388 items in 2022)

System construction

- ✓ Respond to local certification systems by strengthening manufacturing capacity at North American and European manufacturing sites
- ✓ Develop local service systems utilizing overseas manufacturing sites and vendors in North America and Europe (special product designs, regrinding and recoating of solid tools)
- ✓ Select 50 key accounts in the aerospace industry and strengthen global services, from development and manufacturing to sales
- ✓ Consider acquisition and business alliance with North American integrators

Aerospace industry demand forecast



	CAGR (2021-30)	Composition ratio (2030)
Total	7.5%	-
Japan	5.4%	2%
Others	6.6%	7%
China	6.6%	12%
Europe	8.6%	21%
North America	7.5%	58%

Demand declined significantly in 2020 due to the impact of COVID-19, but it is expected to recover rapidly as we approach 2025, with the market expected to expand at an annual rate of about 4% thereafter.

Medical Industry: Market Trends and Growth Scenarios

Focusing efforts on the regenerative medical devices segment (advanced, dental, and general-purpose products) on the strengths of small-diameter solid drills and end mills with performance superiority, aiming for sales increase by 7.6 billion yen (CAGR of 19% or more) by 2030.

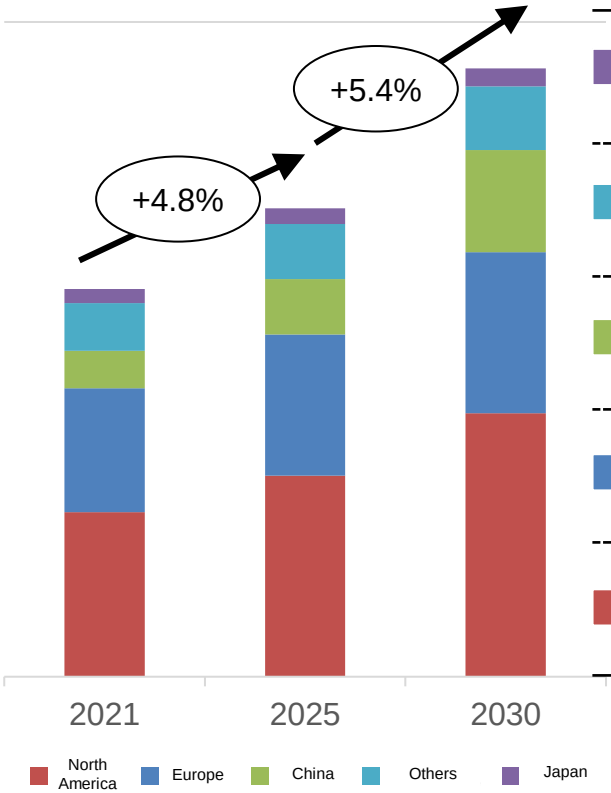
Regenerative medical devices

	Target components	Focus products
Advanced product	Hip joints, Knee joints, Spines 	Small diameter solid end mills 
Dental products	Crowns, Implant screws 	Small diameter solid drills 
General-purpose products	Osteosynthesis plates, Surgical instruments 	

System construction

- ✓ Strengthen marketing, solutions, and sales functions by expanding the medical specialist system in the sales company in the Americas, the largest demand area
- ✓ Develop specialized tools for medical components through industry-academia collaborations to consider new business models
- ✓ Strengthen M&A and strategic alliances to cover all medical component machining applications

Medical industry demand forecast



	CAGR (2021-30)	Composition ratio (2030)
Total	5.1%	-
Japan	3.2%	3%
Others	3.2%	10%
China	11.8%	17%
Europe	3.0%	27%
North America	**5.4%**	**43%**

Demand in the medical industry is expected to expand at an annual rate of around 5% in line with to global population growth and aging.

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Progress of the FY2023 Strategy | Priority Measures

Long-term business goals | Top 3 supplier in strategic markets

Long-term strategy

- Promote clean manufacturing
- Provide high-efficiency products with advanced technology
- Expand advanced metal powder business in electronic devices

Specific Measures in FY2023 Strategy

- Establish a competitive global business base
- Provide high-efficiency tools and digital solutions
- Transition to smart factory and optimization of logistics and supply chain
- Increase recycling rate in our tool recovery system and utilize renewable energy
- Expand advanced powder business to rechargeable battery market

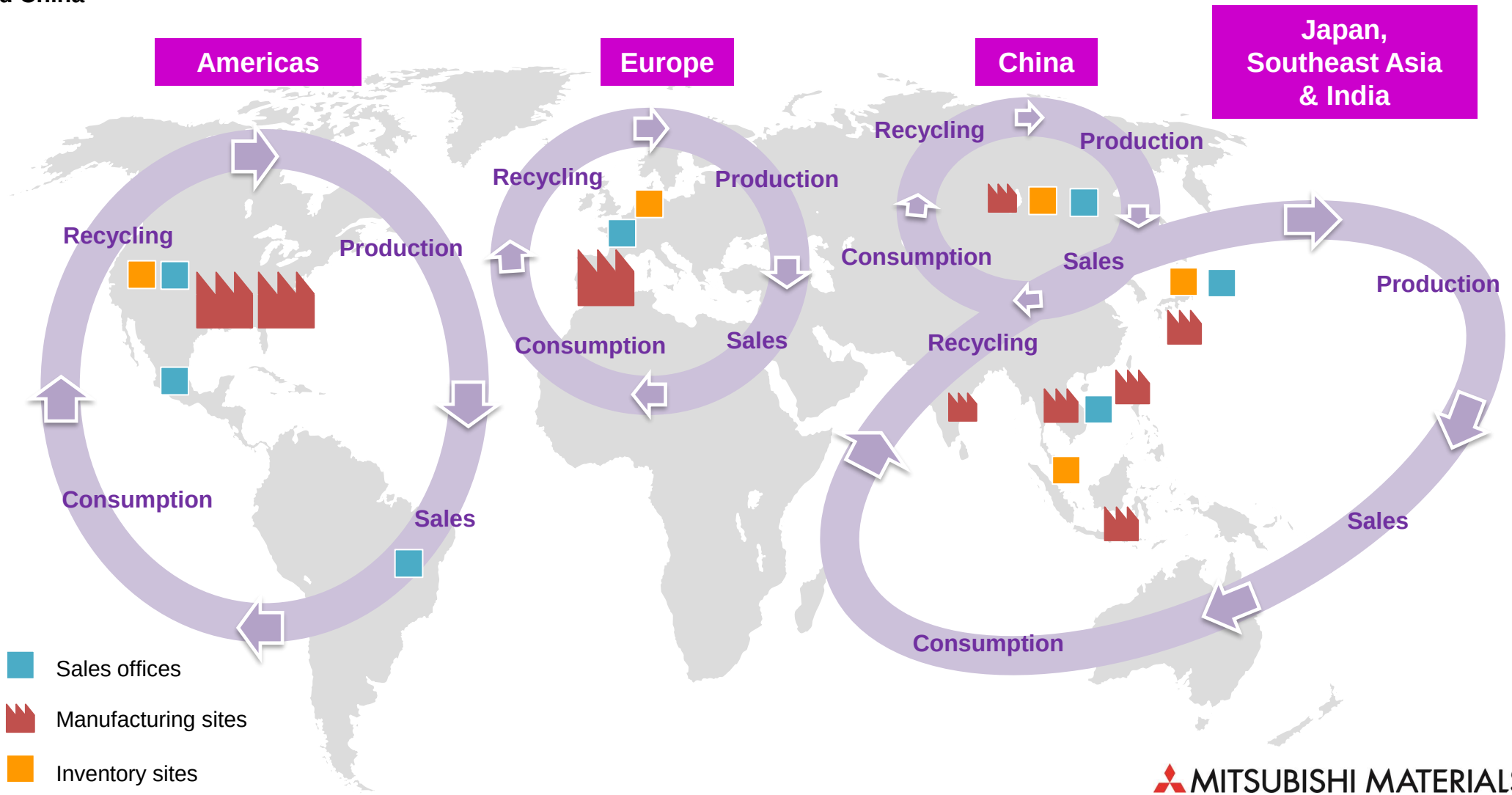
Priority Measures	FY2022 Results	Plans for FY2023 and beyond
Provide products and services near customers through a four-polar system	Formulated a basic concept with each site for **transferring control function** such as manufacturing, sales, inventory.	**First establish European control base**, then expand to the Americas and China
Develop highly efficient tools	Launched sales of **629 new products** targeting key industries	Develop tools for machining difficult-to-cut materials for key industries, plan to launch **2,641 new products** in FY2023
Promote transition to smart factories	Formulated factory vision based on business strategy **to raise the manufacturing capability to the next level**	Promote **cross-departmental projects** to improve efficiency of goods, people and equipment, including progress, spare capacity, and physical management
Expand cemented carbide recycling and utilize renewable energy	**Achieved a recycling rate of 44% in FY2022** (FY2023 Strategy target: 35%)	Collaborate with Masan High-Tech Materials Corporation and **expand the amount of cemented carbide scrap collected from overseas areas** to achieve a recycling rate of 80% by 2030 (FY2023 target: 50%)
	In line with the revision of GHG reduction targets, the plan was changed to make the **entire amount of electricity used in the manufacturing process virtually CO2-free** by FY2031	Begin purchasing renewable energy electricity at domestic manufacturing sites, plan to **increase by 11% each year**
Expand advanced metal powder business to rechargeable battery market	Engaged in developments for the **commercialization of advanced metal powder for in-vehicle secondary batteries**	**Continuous implementation of prototype evaluation tests** at secondary battery manufacturers (lot repeatability confirmation)
	Considered technical cooperation with Masan High-Tech Materials (MHT) regarding advanced tungsten powder	**Continue consideration with MHT**

Building a Global Business Foundation (Four-polar System Concept)

Provide products and services near customers by integrating and strengthening the manufacturing and sales functions within each region.

- Mitigate the risk of supply chain disruptions caused by changes in international situation and natural disaster risks
- Streamline logistics to reduce greenhouse gas emissions

First establish a control base in Europe, where demand for tools is expected to grow, then enhance functionality of sites in the Americas and China



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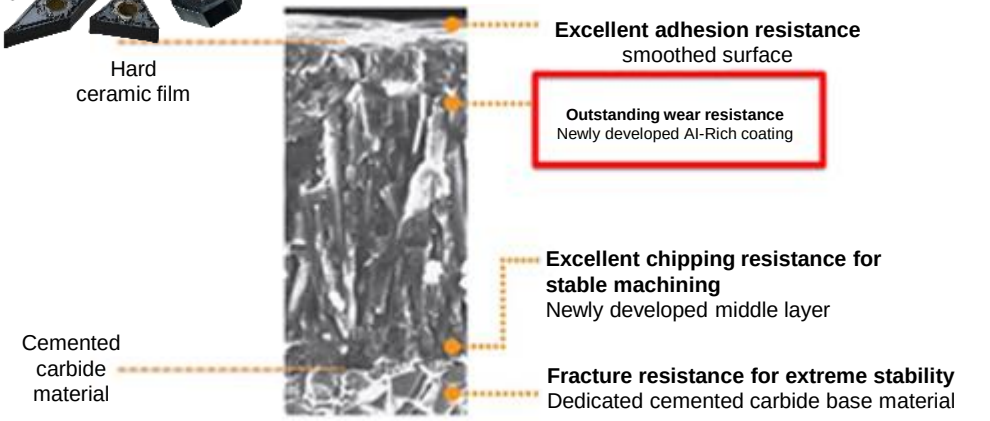
Development of High-Efficiency Tools

Product development realizing overwhelming performance with core competencies in materials and coating technologies

- A tool achieving world-leading performance by adopting new materials and elemental technologies instead of improving on conventional products

  *High efficiency: High speed/high feed (N times), lifespan (N times), cutting resistance (1/N), productivity (1/N), etc.

Insert grage MV series for metal machining (MV1020/MV9005)



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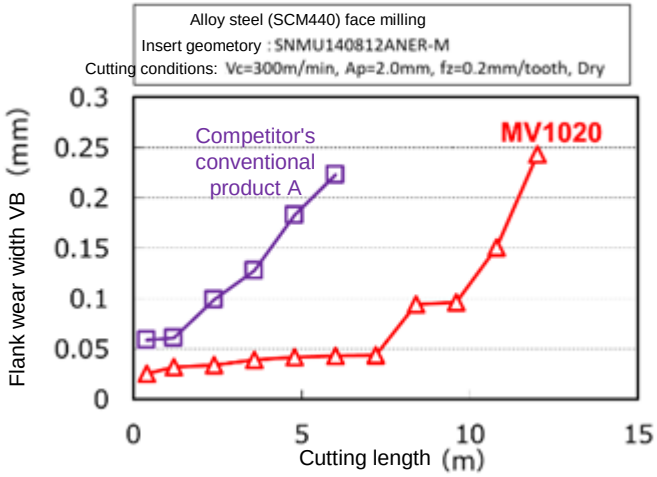

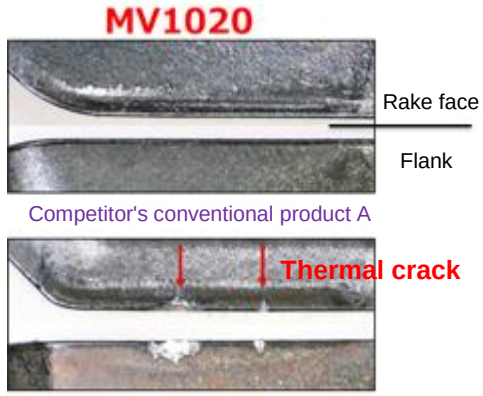

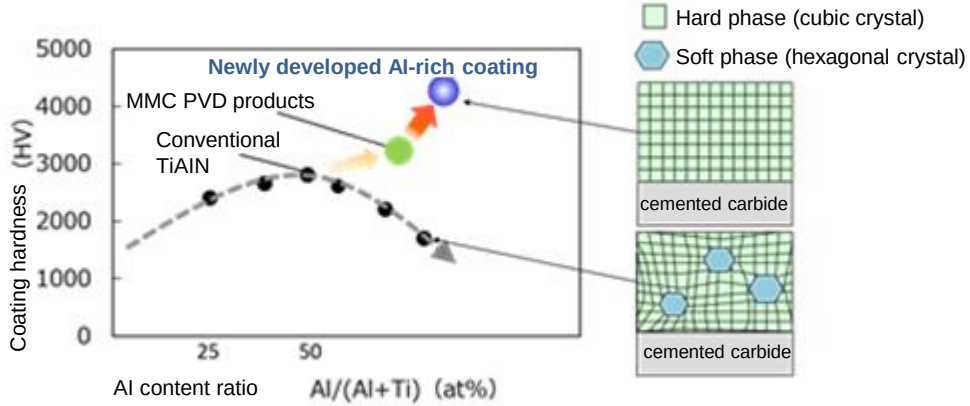

- ✓ **"Newly-developed Al-rich coating technology"** maintains cubic crystals even when Al content of AlTiN film exceeds 80%, which has been difficult with conventional technologies.
- ✓ **One-of-a-kind product** with **industry-leading** deposition technologies.
- ✓ Excellent adhesion and wear resistance in machining **heat-resistant alloy**, which is one of the target components in the aerospace industry.

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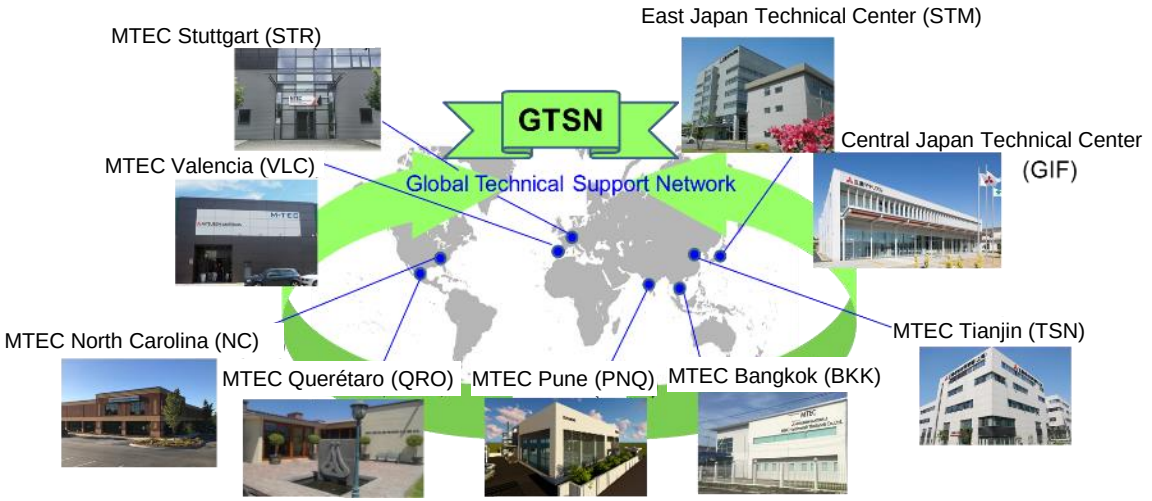
Solutions Proposals Utilizing Technical Centers

Providing solutions that resolve customers' problems and improve productivity

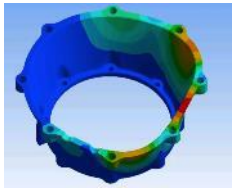
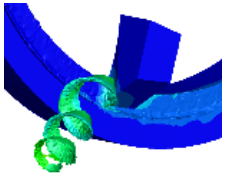
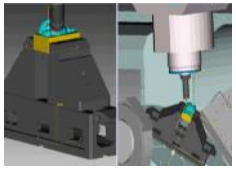
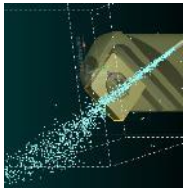
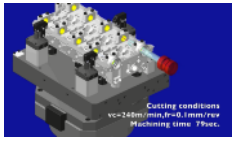
- Solutions provided to customers around the world from technical centers across the globe
- Analyses and evaluations using various processing machines and technologies
- Proposals to customers backed by CAE analysis, other metrics
- Technical workshops held for various skill levels

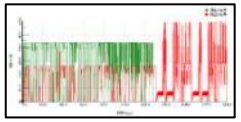
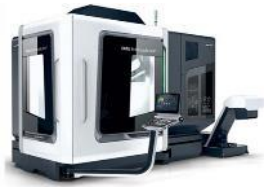


Software
- CAD
- CAM
- CAE (cutting loads/structural analysis)
- Machining simulations

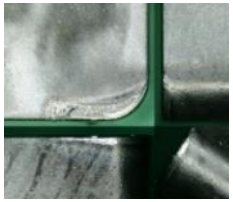
Machine tools (23 units)
- 3-axis M/C (BT30/40/50, HSKA63/100, etc.)
- 5-axis M/C (HSK-A63)
- Lathes (8-inch and 10-inch chucks)
- Automatic lathes (vibration cutting function)
- Multi-tasking machine (10-inch chuck)

Measurement/observation equipment
- Digital microscopes
- 3D measuring microscopes
- High speed cameras
- Multicomponent dynamometers to measure cutting forces
- Surface roughness/contour shape measuring equipment



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Promoting DX: Provision of Solution Services

Contributing to customer productivity and cost reductions with the provision of total solutions (tools and digital solutions)

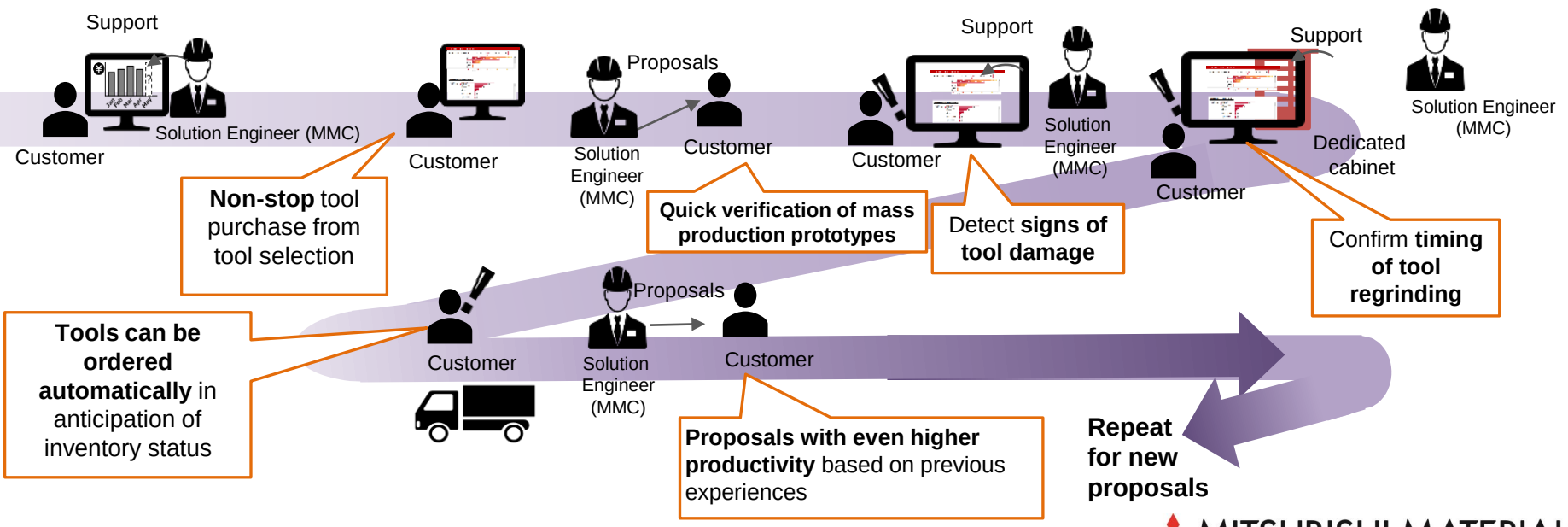
- Transform to a business model that provides not only tools (products: “Mono”) but also digital solutions as services (services: “Koto”) to customers

	Tool selection	Tool purchase	Preparation for mass production (prototypes)	Mass production execution	Tool management
Customer issues	• Quick selection of optimal tools	• Cost reduction through tool cost optimization	• Rapid design and prototyping of highly productive machining methods	• Improvement in machining accuracy • Reduction of machining time	• Efficient tool use through regrinding and recycling • Maintaining minimum stock of tools

Value provided by MMC

Digital service menu

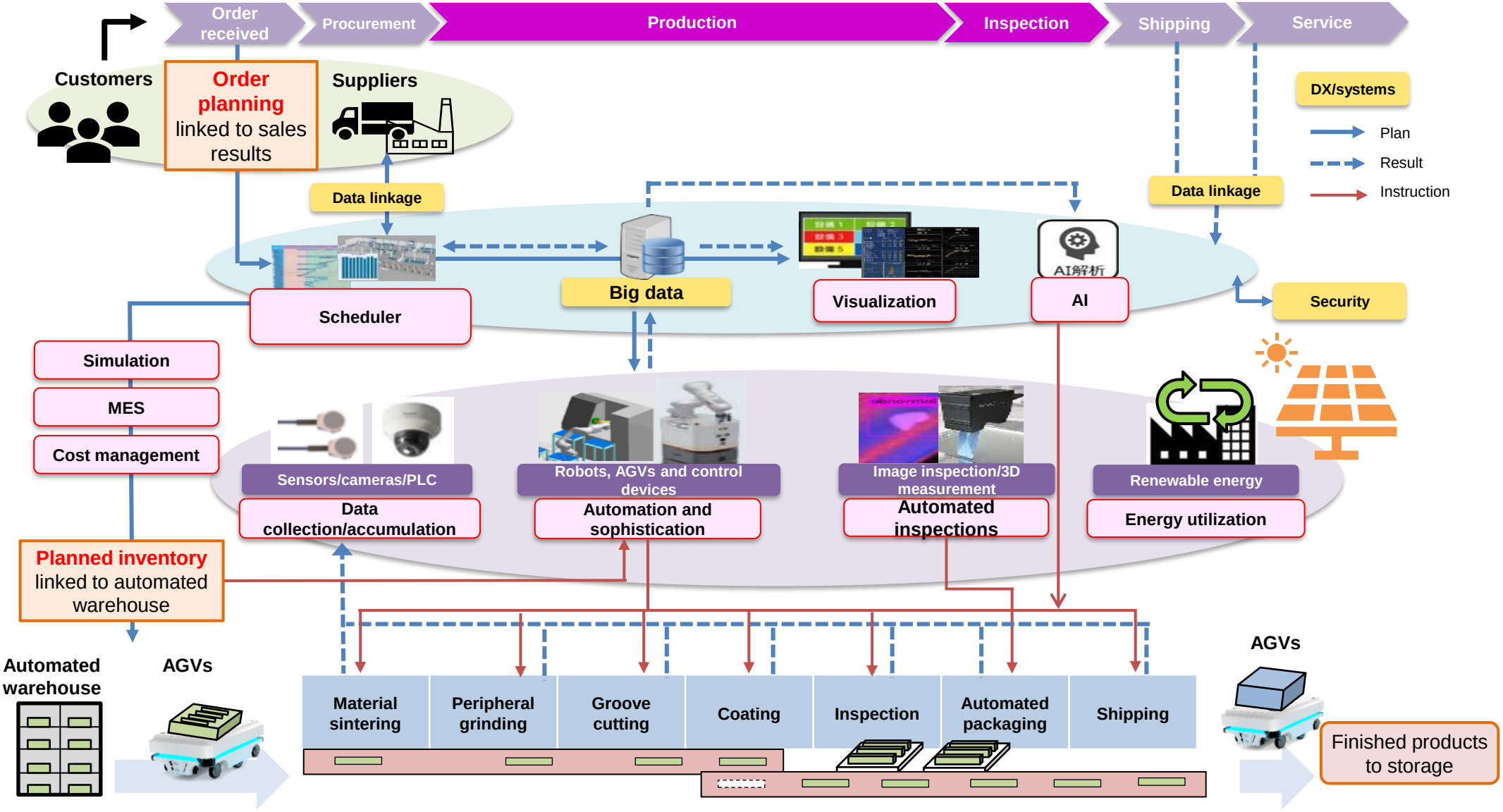
Automated tool selection	Automated process design (process digital planning)	Prototyping outsourcing	Proposals on mass production quality and economic performance	Automated optimization of machine tool control	Automated monitoring of wear status and regrinding



MITSUBISHI MATERIALS

Promoting DX: Smart Factories

Promote shorter lead times and labor savings using smart factories to enhance cost competitiveness



Individual piece flow via automated transport

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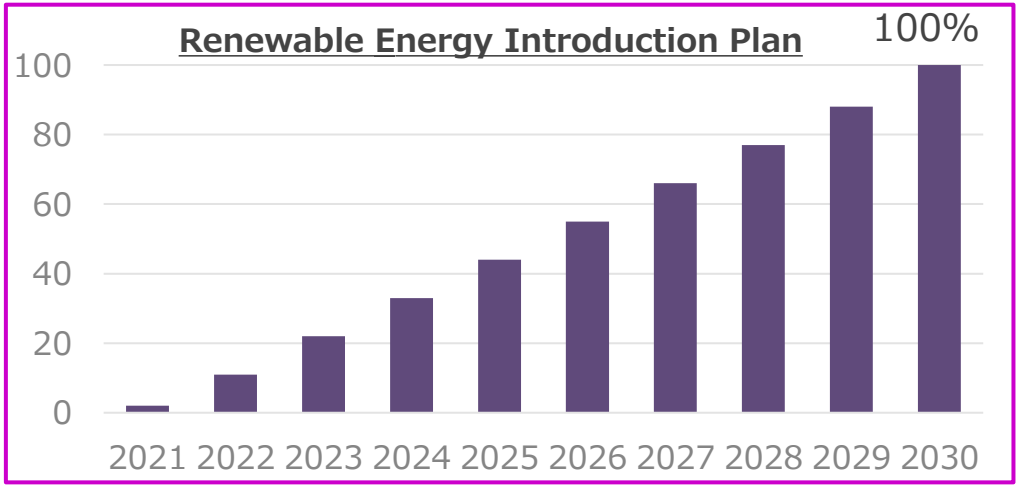
Sustainability Initiatives

Aiming to achieve 100% renewable energy utilization by 2030 to achieve carbon neutrality

Initiative

- Survey of energy usage at manufacturing sites, including overseas
- Establish an action plan for energy saving activities/introduction of renewable energy
- Establish a plan for energy saving improvement activities at domestic and overseas sales offices
- Promote switching to renewable energy (11% annual increase from 2022)

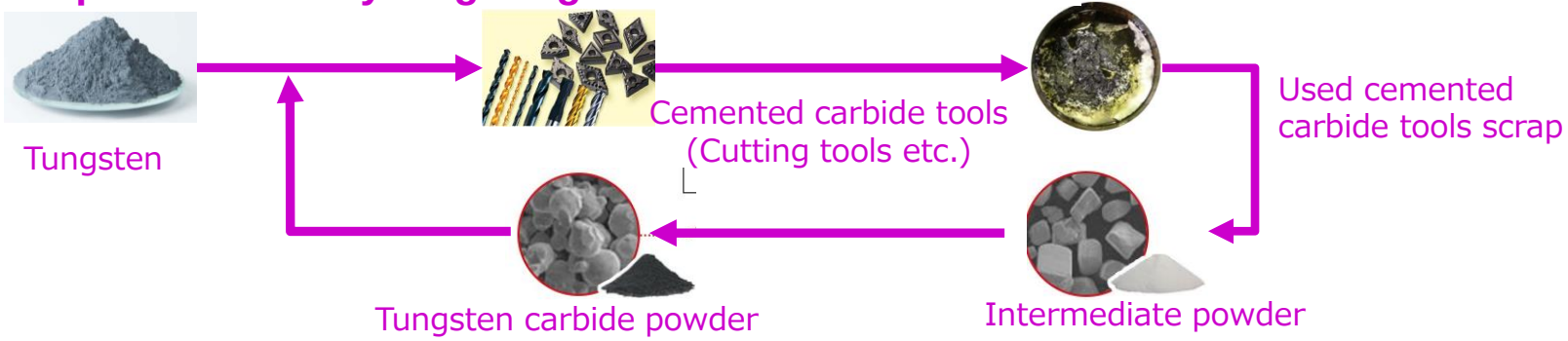


Aiming to achieve a recycling rate of 80% or higher by reinforcing the recycling plant for cemented carbide scrap

Initiative

- Actual recycling rate in the FY2022: 44% (vs. FY2023 Strategy Target: 35%)
- Considering recycling collaboration with Masan High-Tech Materials (Vietnam)

<The process of recycling tungsten into raw materials>



MITSUBISHI MATERIALS

3. Metals Company

Business Overview

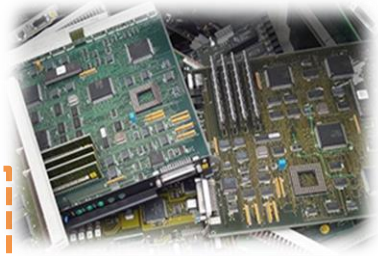
Business	Overview	Strengths	Revenue structure	Market opportunities, outlook and future policies
Resources business	 Investing in overseas copper mines for stable procurement of clean copper concentrate	・Many years of experience in domestic mining operations ・Long-term amicable relations with major resource providers	27 billion yen (FY2022 ordinary profit)	**Market Opportunies** ・Strategy revisions amid the willingness of major resource companies to develop copper mines and decarbonization **Market outlook** ・Tax hikes, stricter regulations and resistance to development due to resource nationalism and heightened environmental awareness ・Deeper exploration of new mineral deposits/remote areas/lower grade minerals and rising impurity levels **Future policies** ・Promote mine development projects and new exploration ・Develop technologies for the removal of impurities from copper concentrate ・Review asset portfolio ・Train resource engineers
Smelting business	 ・Non-ferrous metal smelting using copper concentrate, metal scrap, waste, etc. as raw materials ・Sales of manufactured electrolytic copper, gold and silver, PGM*, tin, lead and by-products (sulfuric acid, gypsum, etc.) *Platinum group metal	・Utilization of the highly efficient, eco-friendly Mitsubishi Process for continuous copper smelting ・The world's No. 1 E-Scrap processing capacity ・Advanced recycling technologies and business infrastructure ・Integrated manufacturing system, from raw materials to finished products ・Various production bases (copper/lead/tin/precious metals/PGM)	23.2 billion yen (FY2022 ordinary profit)	**Market Opportunies** ・Enhanced recovery and commercialization of trace components in the process ・Transition to a recycling-oriented and decarbonized society ・ Expansion of E-Scrap market due to heightened environmental awareness ・Copper consumption trending upward over the medium- to long-term **Market outlook** ・Intensifying competition for collection of E-Scrap ・Brisk market for sulfuric acid, sluggish market for copper slag **Future policies** ・Implement various measures to increase collection of E-Scrap ・Further expand volume of E-scrap processing through advances in valuable metal material flow ・Promote carbon neutral initiatives

Metals Business

Proprietary copper mines
Mining companies
Traders

Copper concentrate

Recyclers



E –Scrap and recycled raw materials

Smelters

Electrolytic copper

MMC Advanced Product Company

Copper processed products

Electrolytic copper, precious metals and by-products (sulfuric acid, etc.)

Copper slag

Mitsubishi UBE Cement Corporation, etc.

Customers

Auto parts manufacturers

Electronics manufacturers

Chemical manufacturers

Trading companies

Etc.

Progress of the FY2023 Strategy | Priority Measures

Long-term business goals | Leader in environmentally-friendly mining & smelting business

Long-term strategy	Stable supply and recycling of nonferrous metal materials, predominantly copper • Creation of a sustainable raw material portfolio consisting of clean copper concentrate and E-Scrap/・Promotion of recycling/・Response to climate change
FY2023 Strategy	• Secure clean copper concentrate by investing in new mines • Develop impurity removal technology in copper concentrate • Optimize valuable metal material flow • Reduce fossil fuels

	Key Measures for FY2023 Strategy	FY2022 Results	Plans for FY2023 and beyond
Mining	Securement of clean copper concentrate by investing in new mines	The Zafranal copper project was partially delayed from the original plan due to local conditions in Peru (e.g., COVID-19). **We made an application on obtaining an environmental permit (EIA).**	**Make final investment decision** after obtaining the environmental permit (EIA) for Zafranal copper project
		Conducted detailed engineering, stripping and other construction work at the Mantoverde mine in preparation for the start of sulfide ore production in 2024 (58% progress against 62.6% plan as of the end of June 2022)	**Steadily progress** Mantoverde copper project **construction work** (The ore dressing plant and tailings dam construction will be completed by the end of FY2024)
		Started **trial operation of the ore dressing plant expansion** at Copper Mountain Mine from the end of November 2021	**Optimize mining operations**, including expansion
Smelting	Optimization of material flow for valuable metal	**Increased recovery of valuable metals** through the installation of slime leaching equipment at the Naoshima Smelter and Refinery. **The tin recovery facility installed at** Hosokura Metal Mining Co., Ltd. continued **stable operations** and recovered tin steadily.	**Develop technologies for separation and recovery of trace components in E-Scrap** for further efficient recovery of valuable metals
	Reduction in fossil fuels	**Identified and optimized factors limiting E-Scrap input**, which can also be used as an alternative fuel, to reduce fossil fuel consumption (Progress as planned)	**Promote fossil fuel substitution through increased E-Scrap processing** by taking advantage of the superiority of Mitsubishi Process for continuous copper smelting

Mining Investment Objectives

- Mining investment is essential for MMC to acquire clean copper concentrates with few impurities and maintain the copper smelting business, which is the foundation of its business.
- Amid global trends toward the realization of a decarbonized society, copper smelting and refining is expected to continue to expand going forward, and MMC must acquire interests in copper mines and enjoy the benefits of high copper prices as demand expands.

Megatrends (risk factors)

Increase in copper concentrate impurities

Increase in impure inputs due to expansion of E-Scrap processing

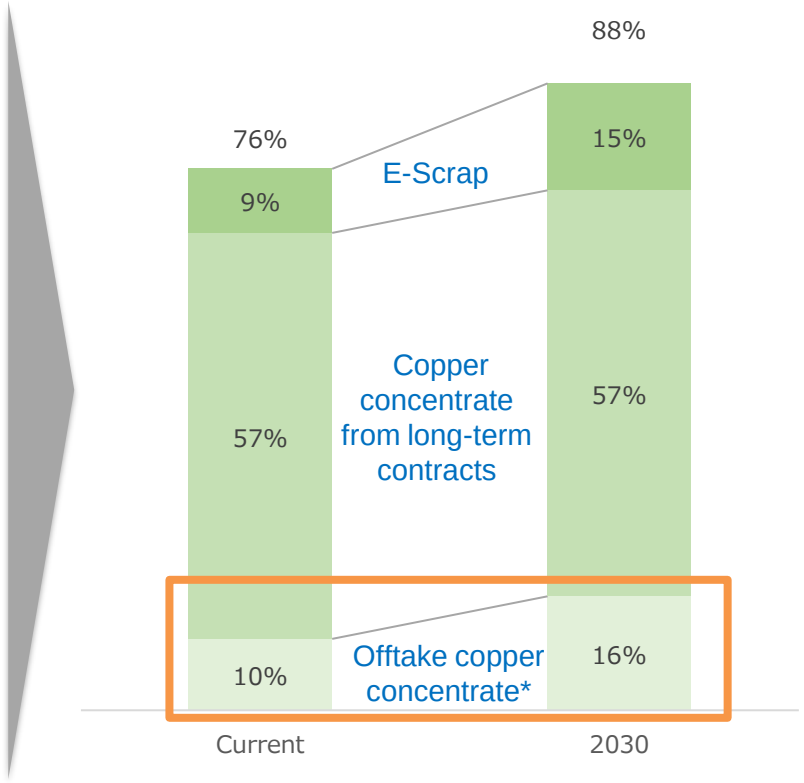
Intensifying competition to acquire copper concentrate

Increased uncertainty due to resource nationalism

Headwinds confronting copper mining due to growing environmental awareness

Long-term strategy

Build a sustainable raw materials portfolio that can cover approximately 90% of copper raw materials required by copper smelters.



*Offtake: Long-term trading rights tied to mining investment interests.

Mantoverde copper mine (Chile)

Zafranal mining claim (Peru)

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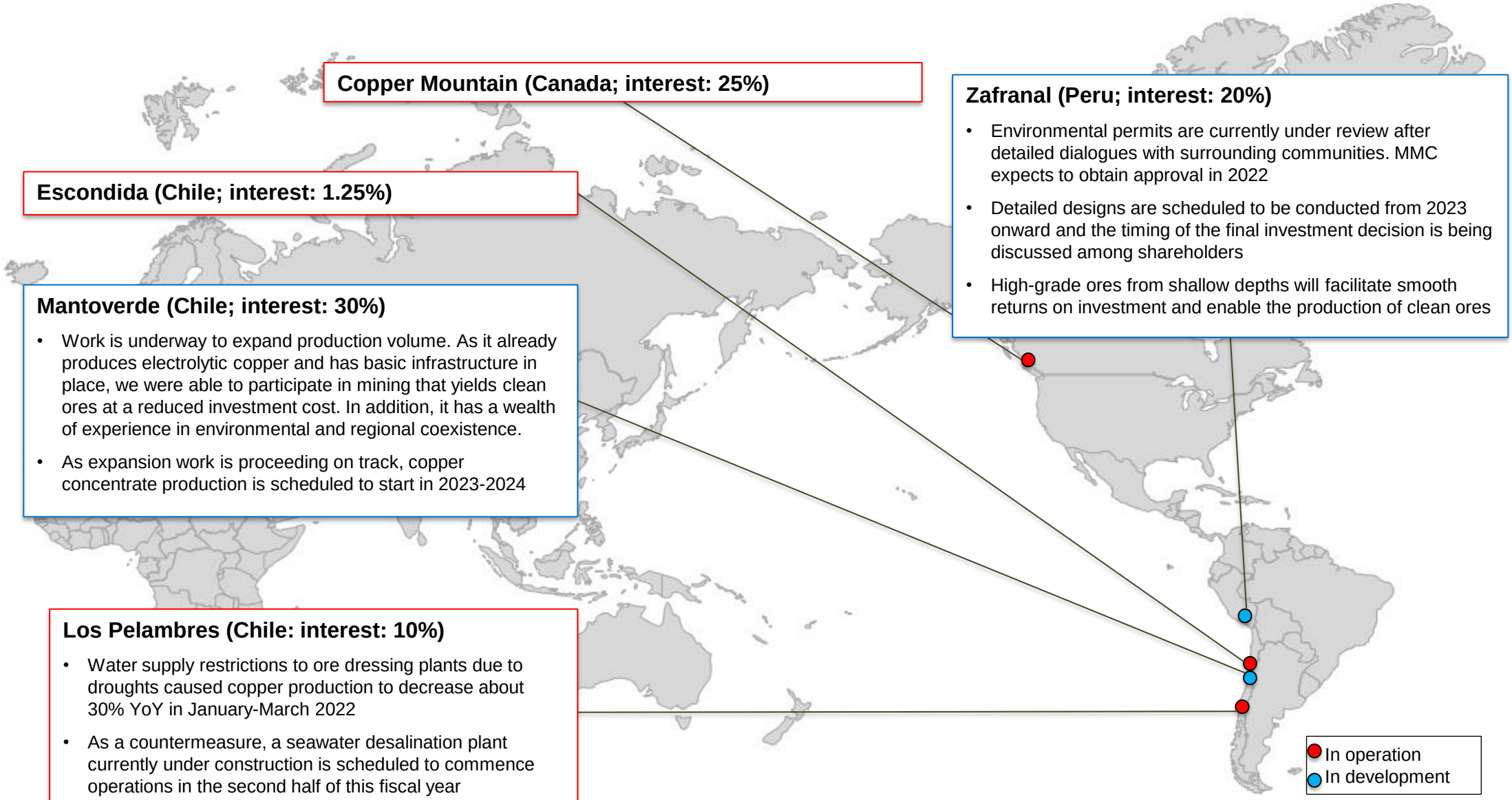
Interest-holding Mines



Copper Mountain (Canada; interest: 25%)

Escondida (Chile; interest: 1.25%)

Mantoverde (Chile; interest: 30%)

- Work is underway to expand production volume. As it already produces electrolytic copper and has basic infrastructure in place, we were able to participate in mining that yields clean ores at a reduced investment cost. In addition, it has a wealth of experience in environmental and regional coexistence.
- As expansion work is proceeding on track, copper concentrate production is scheduled to start in 2023-2024

Los Pelambres (Chile: interest: 10%)

- Water supply restrictions to ore dressing plants due to droughts caused copper production to decrease about 30% YoY in January-March 2022
- As a countermeasure, a seawater desalination plant currently under construction is scheduled to commence operations in the second half of this fiscal year

Zafranal (Peru; interest: 20%)

- Environmental permits are currently under review after detailed dialogues with surrounding communities. MMC expects to obtain approval in 2022
- Detailed designs are scheduled to be conducted from 2023 onward and the timing of the final investment decision is being discussed among shareholders
- High-grade ores from shallow depths will facilitate smooth returns on investment and enable the production of clean ores

Efforts to Increase E-Scrap Processing Volume

Valuable metal material flow optimization

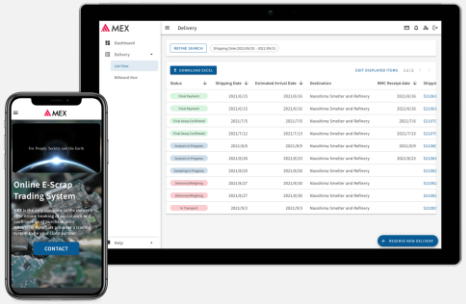
Naoshima Smelter & Refinery

Onahama Smelter & Refinery

MM Metal Recycling BV expansion

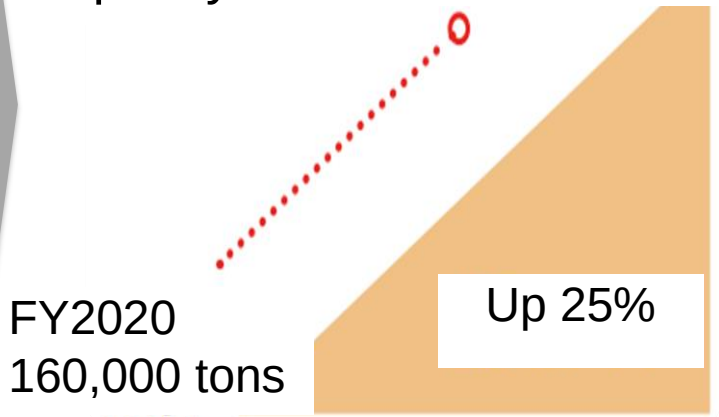
MEX* as a global platform

*Mitsubishi Materials E-Scrap EXchange



E-Scrap processing capacity

End-FY2031 target 200,000 tons



FY2020 160,000 tons

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Measures to Increase E-Scrap Processing Volume: Valuable Metal Material Flow Optimization

- MMC will optimize material flow connecting various production bases (copper, lead, precious metal, tin and PGM smelting) to efficiently recover various valuable metals contained in E-Scrap. To this end, MMC will develop the necessary smelting technologies and improve smelter operations.
- Improve profitability by selling valuable metals recovered from E-Scrap.

Initiative background

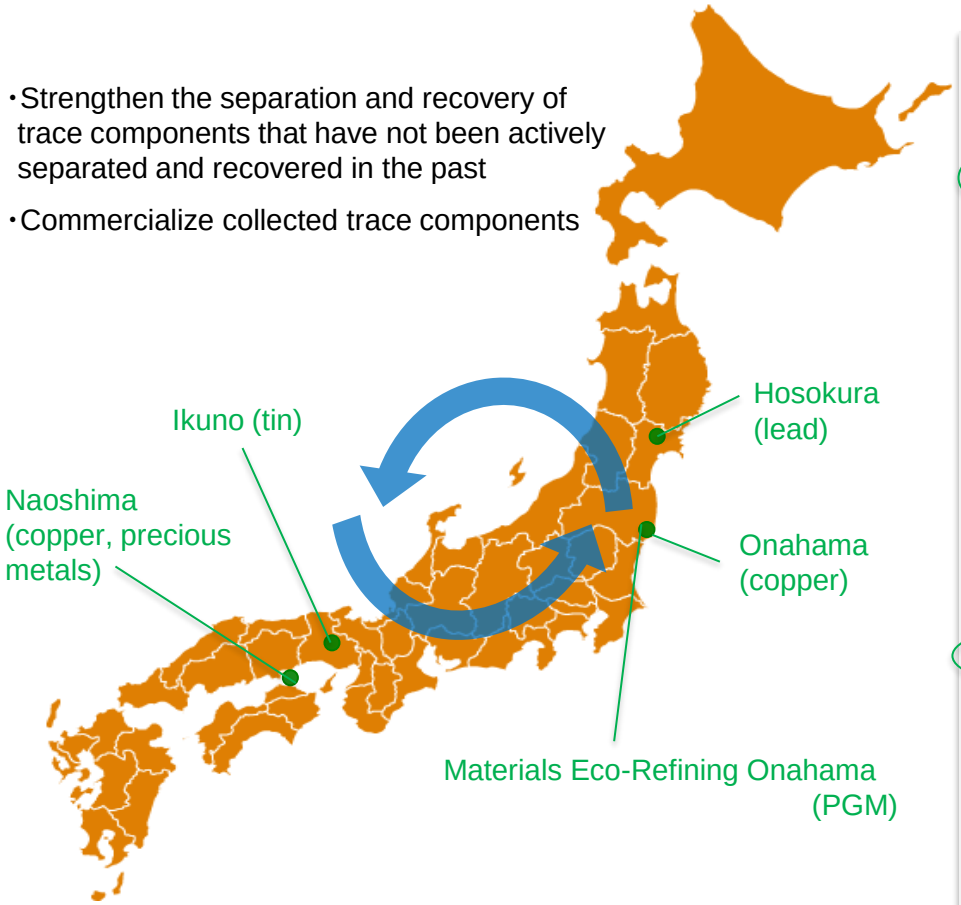
E-Scrap

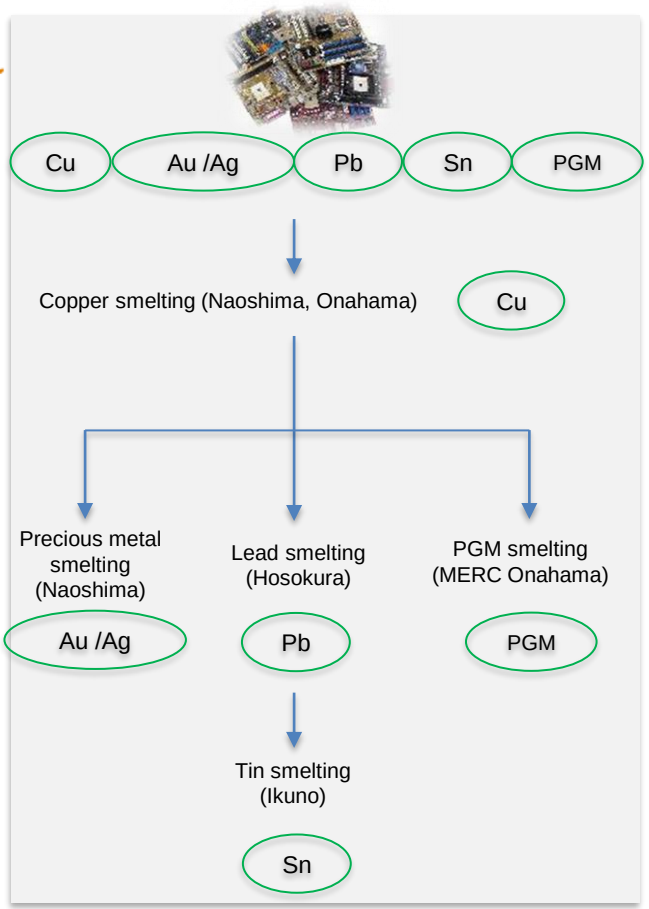
Al Ni Sn etc.

Impact on the smelting process is becoming apparent

Material grid overview

- Strengthen the separation and recovery of trace components that have not been actively separated and recovered in the past
- Commercialize collected trace components





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Measures to Increase E-Scrap Collection: MEX* as a Global Platform

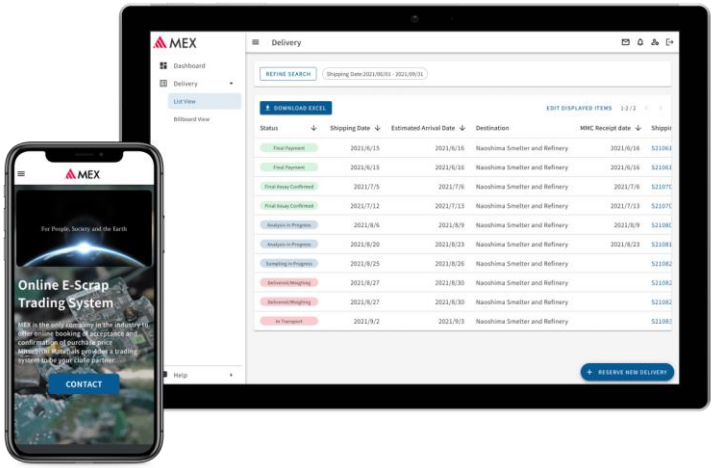
*Mitsubishi Materials E-Scrap EXchange

Customers can trade with confidence

Increased E-Scrap collection volume

Customers

- Intuitive web reservation service (multilingual)
- Check transaction status and quality
- Robust information management system and generous customer support



- Online customer support and operational procedures
- Smooth data integration with business systems
- Data-driven business improvement and hypothesis testing

MMC

- Operating smoothly since its launch on December 20, 2021, with a combined total of approximately 140 companies as registered users in Japan and overseas
- Going forward, MMC will continue to add functions and improve customer convenience with the aim of increasing the amount of E-Scrap collected

4. Environment & Energy Business Company

Business Overview

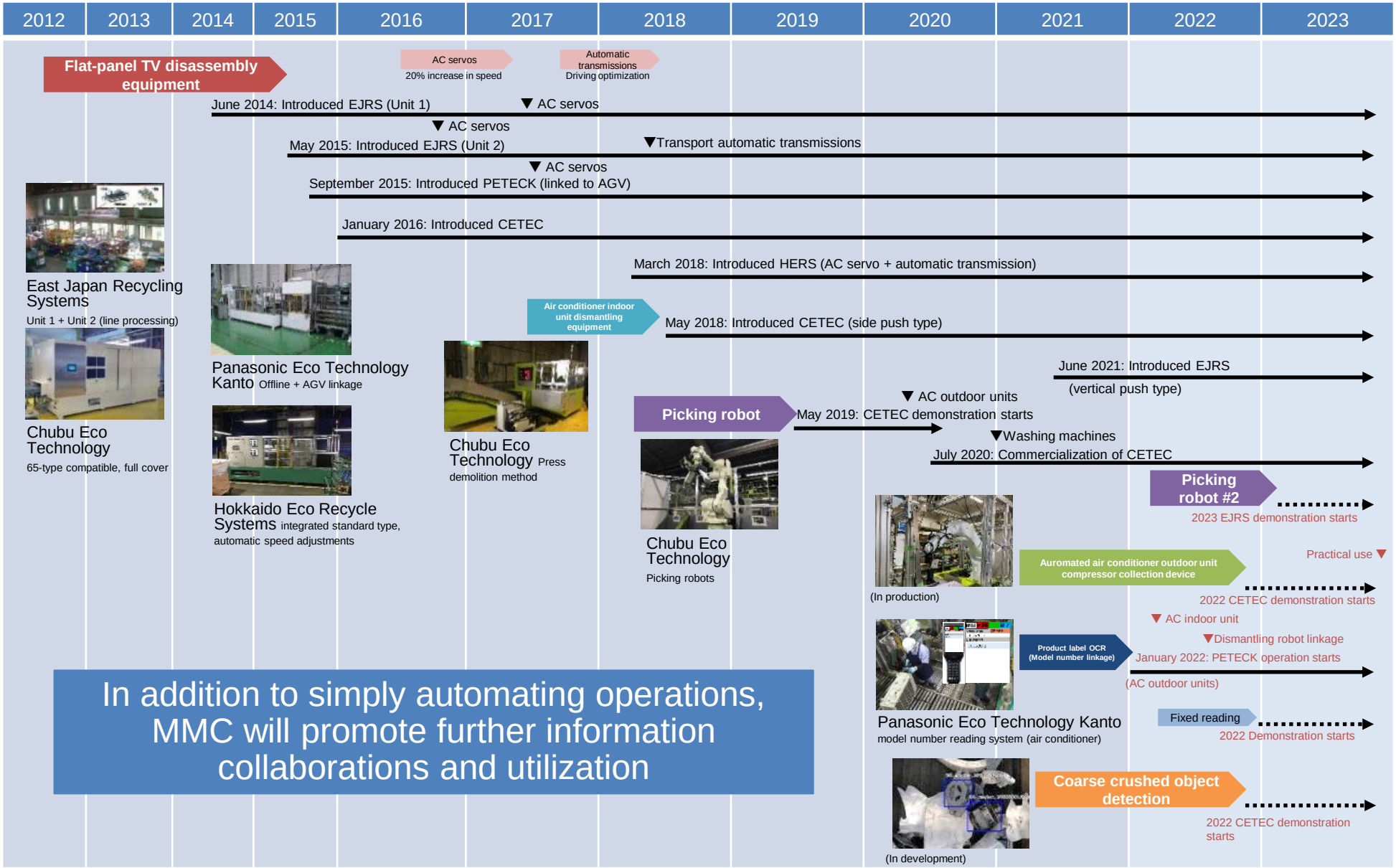
Business	Business overview	Strengths	Revenue structure	Market Opportunities Market Outlook
Environmental Recycling Business	 **Home appliance recycling, automobile recycling, food waste biogasification, Incineration fly ash recycling**	**Recycling processing technologies** **Rare earth recovery technologies** **Incneration fly ash recycling technologies** **Proprietary recycling system (smelters, cement plants)**	1.5 billion yen (FY2022 ordinary profit)	● Opportunities Depletion of mineral resources: Increased demand for recycled resources ● Risks Competitor trends and market entry Manufacturer restructuring Emitting municipality trends
Renewable Energy Business	 **Geothermal power, hydroelectric power, solar power**	**Experience in geothermal energy development and operations**	1 billion yen (FY2022 ordinary profit)	● Opportunities Depletion of energy resources Domestic energy security Climate change (global warming) Reduced CO2 emissions Increased demand for renewable energy ● Risks Building consensus with stakeholders National policy changes, legal reforms

Progress of the FY2023 Strategy | Priority Measures

Long-term Business goals	(Environmental recycling) Driving force of resource-recycling systems (Renewable energy) Leading company in geothermal development
Long-term strategy	• Provision of a safe recycling system with thorough traceability, etc. • Decarbonization by expanding renewable energy business
FY2023 Strategy	• Expand home appliance recycling business, advancement of automation, and improvement of added value of recovered products • Demonstrate LiB recycling technology and solar panel recycling technology • Secure stable plant operations in fly ash recycling business and biogasification business • Complete Komatagawa new hydroelectric power plant, construction of Appi geothermal power plant, and survey of new geothermal sites, survey of new small hydropower

	FY2023 Strategy priority measures	FY2022 Results	Plans for FY2023 and beyond
Environmental recycling	Promote automated dismantling in home appliance recycling	・Completed the concept for robotization of AC outdoor unit compressor removal and recovery work, launched production of demonstration machine ・Transferred picking robot technology to home appliance recycling plant and commenced operations	・Demonstrate robotic technologies facilitating removal and recovery work ・Introduce picking robots for next home appliance recycling plants ・Conduct technological developments for home appliance model number recognition systems
	Enhance added value of recovered products	・Implemented resin pelletization at a home appliance recycling plant	・Dismantling and separation of black motors (separate recovery of copper, iron, etc.)
	Demonstrate LiB recycling technologies	・Launched system demonstration of LiB extraction, pyrolysis, crushing and sorting	・Ongoing implementation of system demonstrations
	Demonstrate solar panel recycling	・Made improvements to further enhance glass peeling performance	・Introduce of post-improvement processes to home appliance recycling plants
	Stable operation of incineration fly ash recycling business	・Continued to improve facilities, reduced trouble in transportation systems and established a foundation for stable operations	・Increase acceptance volume and promote process optimization
	Stable operation of food waste biogasification business	・Continued to improve equipment, with generally stable operations ・Promoted digital transformation (DX)	・Promote business by increasing collection volumes and stabilizing operations ・Promote the visualization of environmental value
Renewable energy	Complete Komatagawa new hydroelectric power plant	・Final lining work is underway at the Komatagawa new hydroelectric power plant	・Commence commercial operations in December 2022
	Construct Appi geothermal power plant	・Construction of Appi geothermal power plant progressed as planned, including preparation of approach roads and commencement of production well drilling	・Proceed with planned construction of Appi geothermal power plant ・Participate in Esan geothermal resources survey project
	Survey new geothermal areas	・Selected for JOGMEC subsidy survey and conducted field survey (Komonomori)	・Selected for JOGMEC subsidy survey and conduct field survey (Komonomori, upper Appi River)
	Survey new small hydropower	・Survey progressed generally as planned	・Continue conducting surveys

Environmental Recycling: Promoting Automated Dismantling (Automation Technologies Developed Thus Far)



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[Video] Processing internal boards of flat-screen TV (Automatic dismantling of unscrewing)

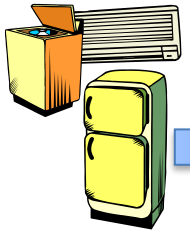
This page is a video.

[Video] Picking recovered items of air conditioner outdoor unit

This page is a video.

Environmental Recycling: Enhancing Added Value of Recovered Materials

◎ Home appliance processing flow



Manual disassembly → Crushing machines → Magnetic sorting machines → Eddy current sorting machine → Water specific grabity Sorting machine

- Magnetic sorting machines → Iron
- Eddy current sorting machine → Nonferrous metals (copper, aluminum)
- Water specific grabity Sorting machine → Residue

Resin purification process

Crushing → Water specific grabity sorting → Dry gravity sorting → Pulverization → Extrusion → Pelletizing

→ Compounder → Molder

In-house production of PP raw material pellets from recovered resin after crushing

PP raw material pellet

Example: In-vehicle speaker parts

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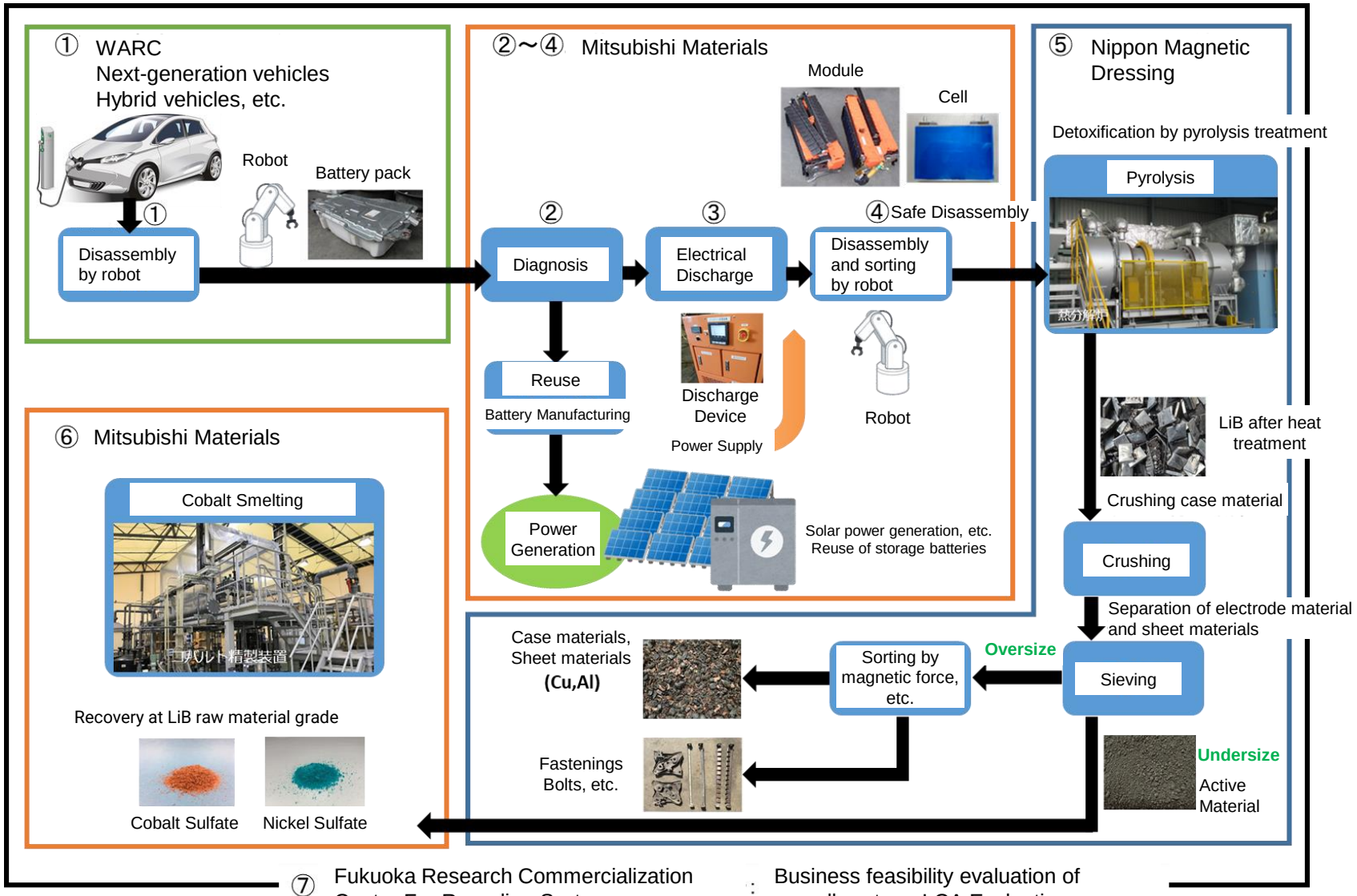
Environmental Recycling: Demonstration of Lithium-ion battery (LiB) recycling technology

■ Overall optimal LiB reuse, recycling technology, and system demonstration in the Kitakyushu region

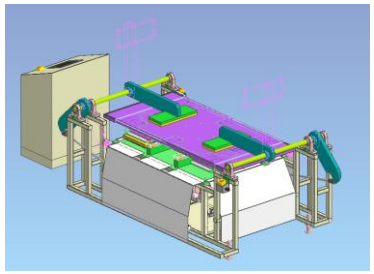
*Demonstration project commissioned by the Ministry of the Environment (Period: FY2021 to FY2023)

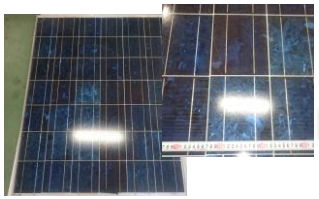


MITSUBISHI MATERIALS

Environmental Recycling: Solar panel recycling demonstration

◎Solar cell module processing process





Solar cell module

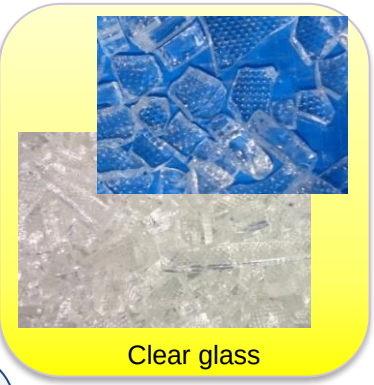
Frame Separator

Heater

Glass Separation machine

Vibrating ssieve

Color Sorter

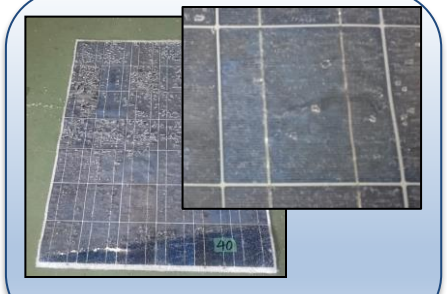


Clear glass

Raw materials for glass recycling

Aluminum frame, J-BOX

Raw materials for recovery of aluminum, copper, etc.

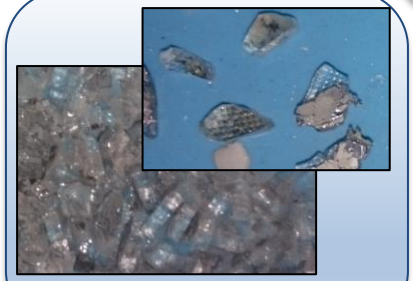


Separated sheets

Silver recovery materials

Smaller than 2mm

Silver recovery materials



Colored glass

Silver recovery materials

Demonstration in home appliance recycling plant

I. Improving quality and recovery rate of glass and back sheet by improving the separation
⇒ Introduction of heating equipment and remodeling of the glass separation machine

II. Labor and manpower saving through automation of frame separation and panel transfer
⇒ Introduction of frame separator and panel transfer equipment

III. Reduced transportation and recycling costs by cutting back sheets
⇒ Introduction of seat cutting machines

Environmental Recycling: Food Waste Biogasification Business Model

Earth Club (Co-op group company)

Power companies

550 kW
13 MWh/day

Effective use of surplus land
Collaborations with infrastructure facility

Excreta treatment facility

A portion of electricity is used in Co-op stores
Turning food waste into electricity and recycling

FIT power

Co-op Deli & Co-op Mirai (Distribution centers, stores)

Food waste

Food producers (Dischargers)

Collection carriers

Collection & agency business

NEFC Biogas plant

Residue

Sludge
Waste plastic

Zero final disposal recycling

Cement recycling

Cement plants

Ichikawa Kankyo Engineering

MITSUBISHI MATERIALS

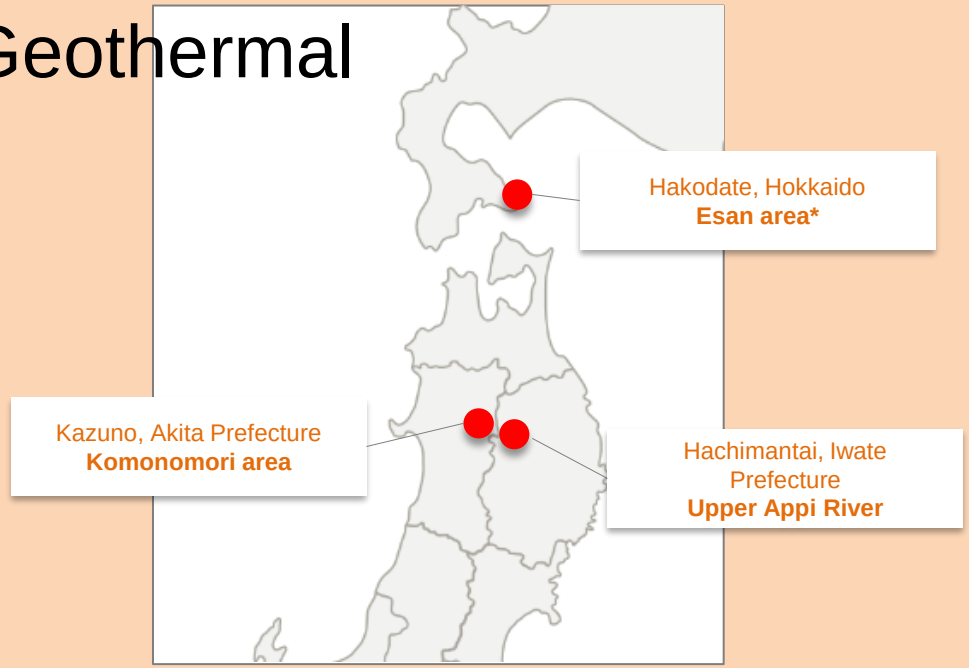
Renewable Energy: Power plants under construction

	Komatagawa New Power Plant	Appi Geothermal Power Plant
Operator	Mitsubishi Materials Corporation	Appi Geothermal Energy Corporation（MMC has 51% stake）
Authorized output	10,326kW	14,900kW
Scheduled to start operation	December 2022	April 2024

※Komatagawa 1st and 2nd (7,470 KW in total) will be abandoned.

Renewable Energy: New Power Plants (Geothermal, Hydroelectric)

Geothermal



Komonomori, Upper Appi River, Esan areas

Resource survey
(JOGMEC subsidized project)

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Determine expected output and operation start time

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Construct power plant

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Ongoing development of new geothermal areas

Hydroelectric

Kazuno, Kita-Akita and surrounding areas

Conduct new hydropower surveys
(Preceding: Osanai, Kurosawa sites)

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Aim to launch operations from the site where its business feasibility has been confirmed

*Esan area: Invested 30% in Hakodate Esan Geothermal LLC and participated in project.

MITSUBISHI MATERIALS

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