Manufacturing Excellence & DX Briefing

March 6, 2024

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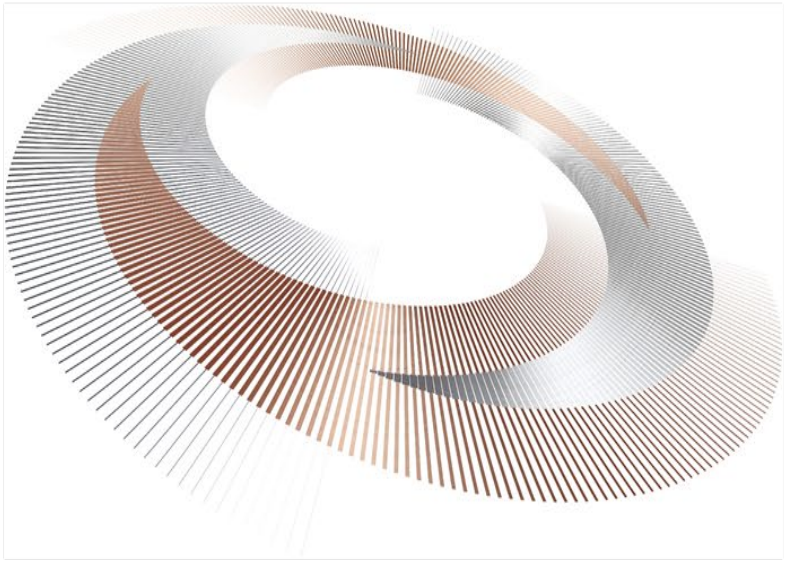

For people, society and the earth, circulating resources for a sustainable future

In order to make careful use of limited resources,
we will give new life to used products as new resources.
We will return these resources to society with new value added.
We will build a platform for this resource circulation and create value as an active player.
As we look to the future, we will make a strong contribution to the creation of a sustainable society,
and help to widen the scope of resource circulation.

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Manufacturing Excellence and R&D Strategy

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Materiality

Materiality
Creation of a recycling-oriented society
Contribution to global environment
Sustainable supply chain management
Respect for human rights
Workplace safety and hygiene
Maintenance and improvement of governance
Retainment and utilization of human capital
Stakeholder communication
Deepening of DX
Initiatives to create new value

Key Themes	Main Initiatives	Objectives, etc.
Creation of innovation	Building and execution of new business creation processes for continuous creation of businesses to be developed (increase in themes; business commercialization; growth of new businesses)	FY March 2024: Launch of acceleration program By FY March 2028: Establishment of organization system; ongoing investment and lending strategies (new business creation, M&A, etc.) FY March 2031: Operation multiple businesses of a prescribed size
Exploration and creation of social value	Creation of rare earths and rare metals recycling business	Black Mass processed FY March 2026 900t per year FY March 2028 3,000t per year FY March 2031 6,000t per year
Strengthening of manufacturing	Execution of basic policy for strengthening manufacturing capabilities (strengthening of manufacturing capabilities through PDCA cycles for strengthening our manufacturing constitution; reinforcement of the manufacturing foundation technology development and improvement)	Pursuing issue setting, problem solving and plant capability evaluation from businesses and plants vision based on the FY2031 Strategy; continuation of working on innovation to improve manufacturing capabilities = continuation of specialization

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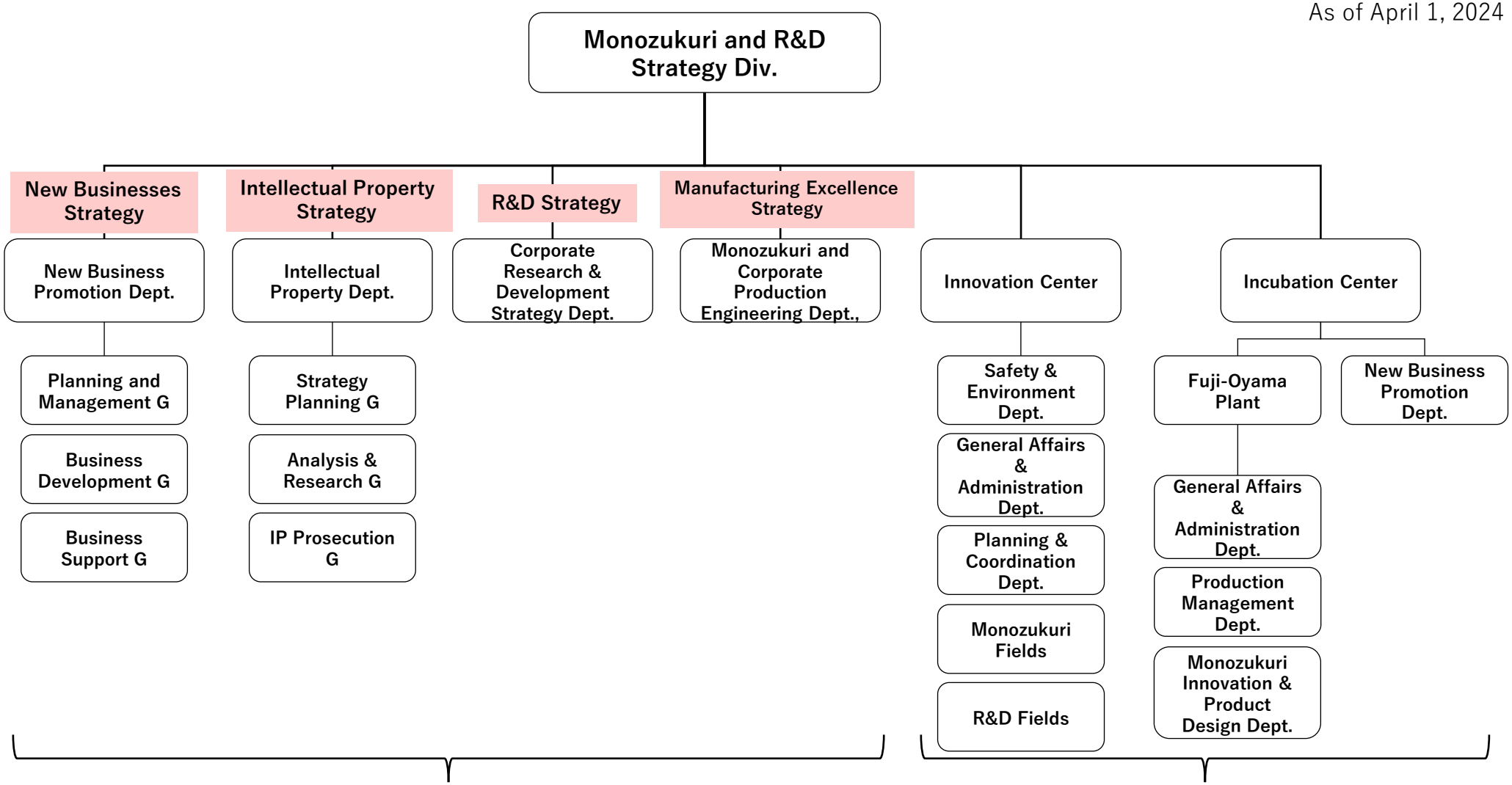
Monozukuri and R&D Strategy Division: Organization and Strategy Promotion System

As of April 1, 2024



Strategy Formulation / Promotion

Strategy Implementation

Implementing Strategies in conjunction with Company Development / Technical Divisions, Centers / Laboratories, and our Innovation Center / Incubation Center

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Manufacturing Excellence Strategy

- Formulate a vision for each plant based on the FY2031 Strategy, work to evaluate plant capabilities, set issues and solve problems.
- Specialize manufacturing capabilities through bottom-up activities, enhancement of our manufacturing foundation, and development & improvement of our technologies.

Specialization

Visioning based on business strategy

Evaluating plant capabilities and setting issues

Evaluating the capabilities of plants by ourselves and pursuing solutions to problems

- Plant innovation capability
- Policy management capability
- Mass production capability
- Plant operation capability
- Plant improvement capability
- Organizational and talent development capabilities

Technology development and improvement

- Improvement of process and process technologies
- Conversion to a smart factory
- Establishment of AI utilization and automated inspection technologies
- Data collection and infrastructure development

Enhancement of digital technology and expansion of the application of utilized technology through a promotion system in which each department works closely together

Manufacturing foundation

- Reform of production preparation process
- Strengthening field capability-Supervisor role reform

Reform toward a special status that is not an extension of the past

Bottom-up activities

- Strengthening human resources
  Development of human resources who can understand the principles and solve the problems
- Fostering a culture of improvement
  Providing opportunities for trials that promote motivation
- Support for problem-solving
  Providing opportunities for autonomously solving problems

Strengthening manufacturing capabilities

Strengthening manufacturing foundation

Strengthening our manufacturing constitution

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Current Efforts to Enhance Manufacturing Capabilities

Area	Previous Strategy (- 2022)	Current Strategy (2023 - 2030)	- 2050

New Functions & Effects

(Internal Development, External Collaboration)

Digital Twin

- Promoting Smart Factories
- Process Optimization
- Enhancing Productivity
- Predictive Maintenance
- Coordinating Talent & Equipment
- Visualization
- Safety Measures
- Operational Support & Education
- Compliance with Operational Standards
- Skill Transfer
- Location Management
- Optimizing Internal Logistics
- Utilizing DX
- Developing AI Professionals

<Digital Twin>

This technology creates a virtual model of the physical space using data collected and compiled via IoT, etc.

Primary Benefits

① Equipment Maintenance: Real-Time
② Quality Improvement: Virtual Simulations
③ Risk Reduction: Virtual Simulations
④ Time Saving: Virtual Simulations
⑤ Cost Reduction: Virtual Simulations
⑥ Improved Services: Real-Time

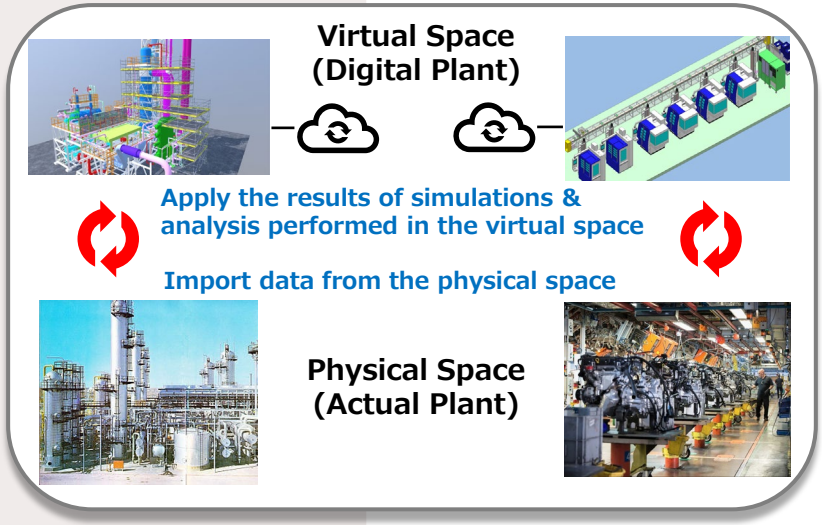
New Capabilities

Smart Factories

Automation (Sophisticated Sensing & Control)

Human Support

- AI Data Analysis
- Machine Learning / AI Image Search
- Process Simulation & Plant Simulation
- Implementing AGV Systems & Robots
- Sensing (Precision / 3D / Spectral)
- Data Collection Infrastructure
- Production Management System / Scheduler
- Work Analysis / Flow Line Analysis / Gaze Analysis
- Voice Recognition / Wearable Devices / VR / MR
- Edge Computing / Edge Devices



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(Achievable Project) Current Efforts to Enhance Our Manufacturing Foundation

【Achievable Project】

- **3-year project (FY Mar. 23 – FY Mar. 25)** intended to **enhance our manufacturing foundation** (FY Mar. 22: preparation period)
- We aim to be an organization that continuously produces results and build **systems that promote autonomous improvement, and the culture of talent development needed to support it**, through quality stabilization and efforts to strengthen production management, while always moving forward.

◆ Steps to Strengthen Production Management, Current Progress

Currently

Phase 1
Detailed Examination

Carefully examine current improvement activities, unify activities
- ・understand status of activities
- ・propose new activities
- ・plan activities in line with capabilities

Phase 2
Strengthening Footing

Site visualization & initial improvement
- ・understand production progress
- ・understand clear lead times
- ・understand & improve bottleneck processes, process management loss
- ・understand setup times, improve procedures

Phase 3
Polishing & Preparation

Accelerating improvement
- ・improve in-process inventory
  evaluate compliance rate for standard operations
- ・reform the role of auditors

Phase 4
Strengthening Our Manufacturing Constitution

Establishing improvement
- ・meet targets for in-process inventory, improved productivity, standard operations
- ・reform the role of auditors
  establish/strengthen onsite presence

◆ Steps for Quality Stabilization, Current Progress

Currently

Phase 1
Initial Analysis
- ・understand situation on the ground (sites)
- ・analyze defects, find true causes
- ・identify underlying technologies necessary to prepare for production
- ・connect to production preparation process
- ・prepare systems
  (in terms of products and underlying technologies in preparation for production)

Phase 2
Starting Activities
- ・initial analysis
- ➡ anticipate, take measures against causal factors
- ➡ There are limits due to complex underlying technologies required in preparation for production.

Phase 3
Reaping Results
- ・reap results from underlying technologies being advanced concurrently
- ➡ There are limits to measures that can be taken in response to defects of unknown cause.

Phase 4
Achievement!
- ・analyze factors involved in defects of unknown cause
- ・deep investigation of underlying technologies
  ➡Eliminate defects
- ・ **standardize the production preparation process**

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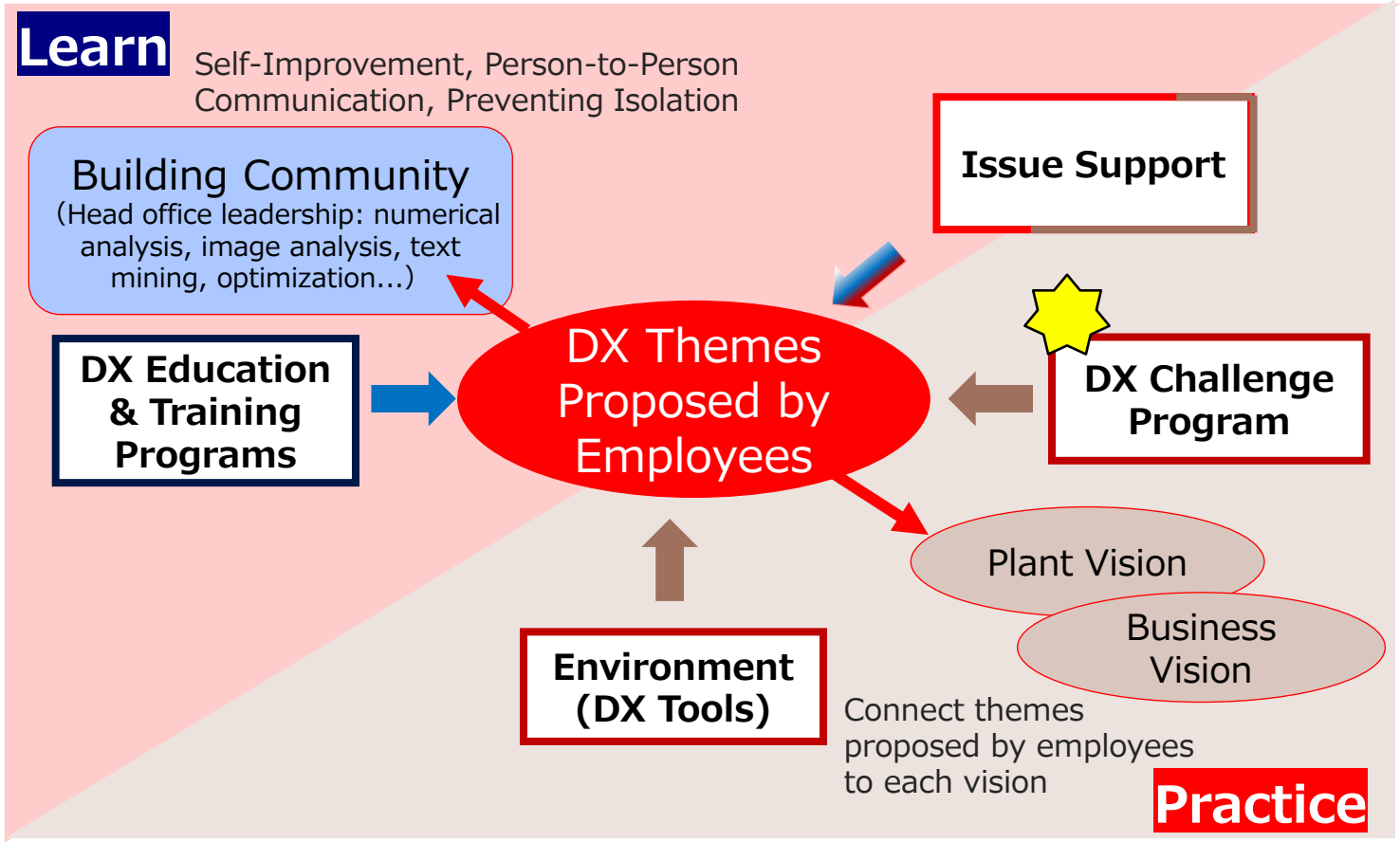
Current Efforts to Strengthen Our Manufacturing Constitution (DX Challenge)

Concept: Cultivate talent by providing all employees with a place to learn and practice DX through our Company-wide activities.

DX Challenge Program

- Recruit bottom-up themes within a defined scope (number, budget)
- Costs of initial stages are paid from DX funding
- Embrace challenges / lower barriers to participation

・DX Challenge Stats
1st Period (Oct.7, 2022 - Sep.29, 2023)
Theme Submissions : 19　Implemented: 7
2nd Period (Sep.30, 2023 -)
Theme Submissions : 8



【Overview of Other Measures】

■ **Issue Support**
- Pursue solutions to problems faced by sites with support from the appropriate experts at the Strategic Headquarters

■ **DX Education & Training Programs**
- Grow advanced digital talent
- Inspire employees to seek to attempt specific things and experience specific, relatable activities and changes

■ **Environment (Tools)**
- Create an environment where even people without DX experience can quickly put it into practice, including RPA, data visualization & analysis, and no-code tools

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R&D Strategy - R&D Strategy under the FY2031 Strategy -

We are achieving sustainable enhancement of corporate value by creating new products, technologies, and businesses.

R&D Basic Policy

- Developing materials with a focus on the future
- Creating new products and technologies to enhance business competitiveness through the integration of the Corporate and Division Lab
- Early realization of R&D results through industry-government-academia collaboration (including CVC)

Providing Circulating Resources for a Sustainable Future

FY2031 Key Policies

- Strengthening both functions: creating new materials and resource recycling
- Reducing GHG emissions across the whole product lifecycle
- Comprehensive organization management covering everything from idea creation and R&D to mass production and commercialization
- Accelerating the selection, implementation, and commercialization of development themes through flexible allocation of business resources (personnel, capital)

Fields of Focus

Resource Recycling	● Separation / Recovery / Refining
Decarbonization	● Energy Materials ● Green Materials ● Green Processes
Semiconductors	● Mounting Materials ● Mounting Components (Resin Composites)
Mobility	● High-Performance Copper Materials & Components ● Carbide Tools

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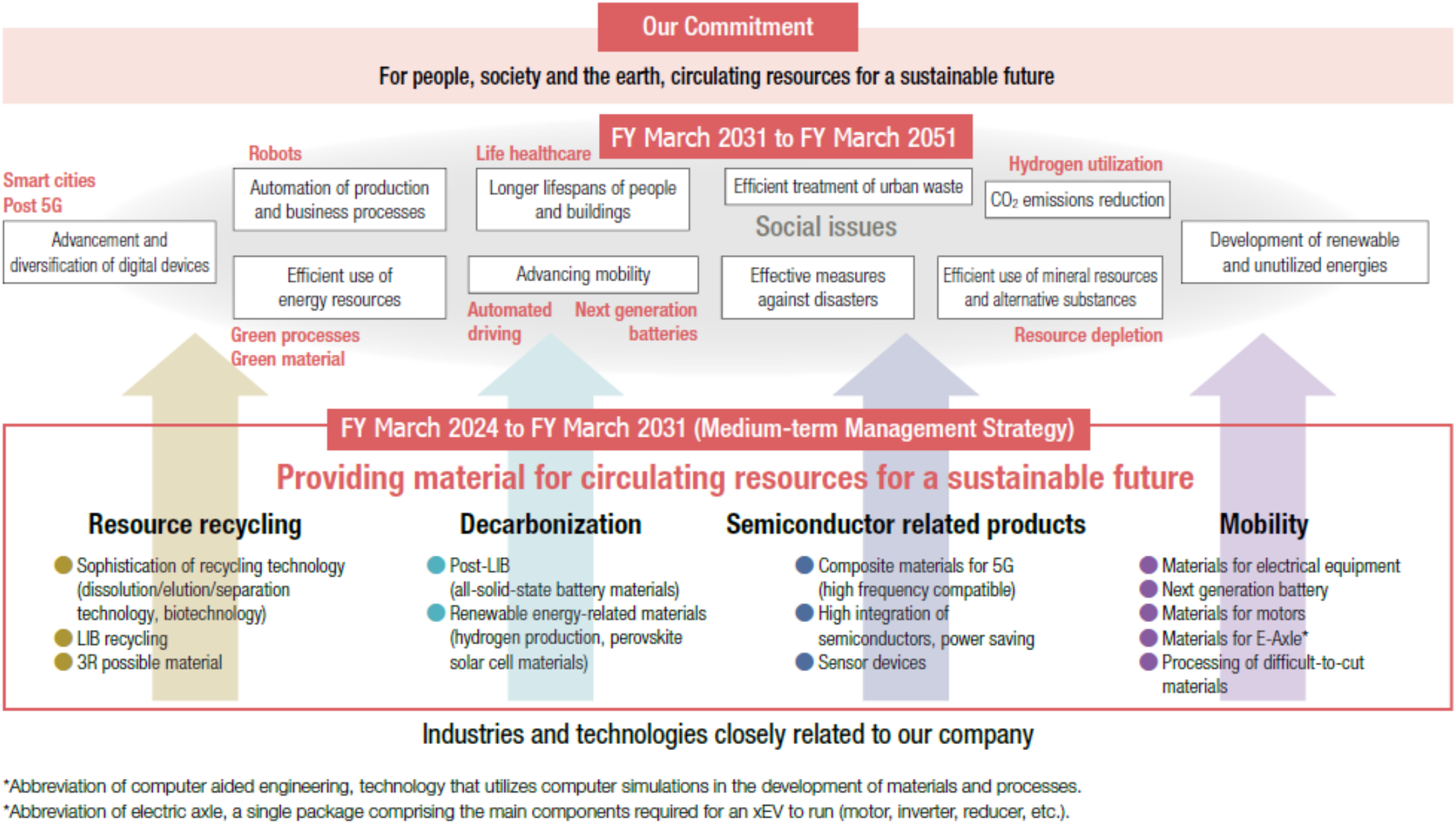
R&D Strategy - Our Commitment and Mega Trend -



*Abbreviation of computer aided engineering, technology that utilizes computer simulations in the development of materials and processes.
*Abbreviation of electric axle, a single package comprising the main components required for an xEV to run (motor, inverter, reducer, etc.).

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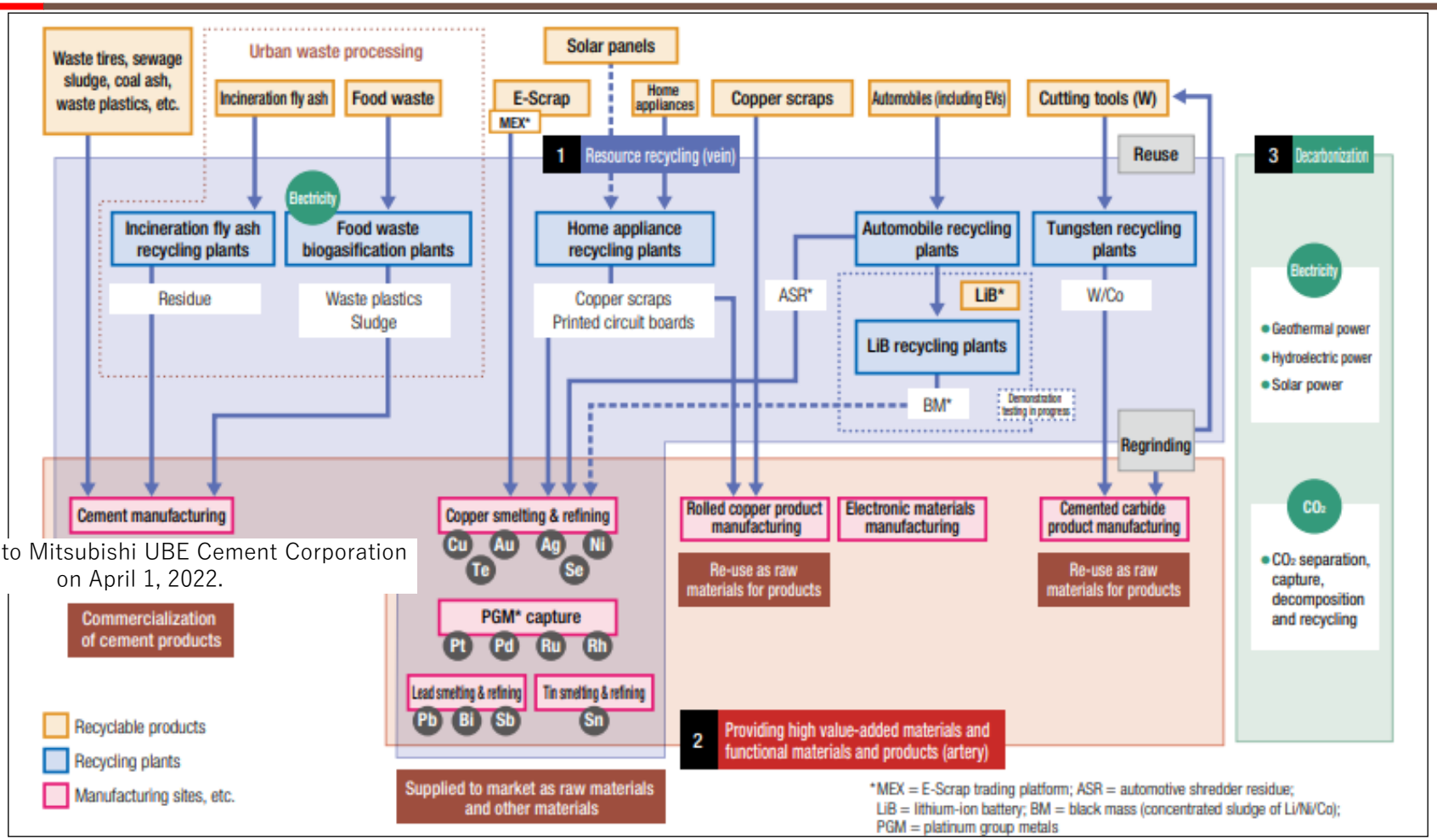
R&D Strategy - Theme Setting Policy (Keen Awareness of Resource Recycling & GHG Reduction)



Transferred to Mitsubishi UBE Cement Corporation on April 1, 2022.

1. Resource Recycling (Veins)

- Developing recycling technology to extract value from waste and rare elements (**LIB recycling**)

2. Providing High Added-Value Materials, High-Performance Materials, and Products (Arteries)

- Developing sustainable materials & components that aim to reduce CO2 emissions throughout the product's lifecycle, rather than focusing only on recycling (**High Strength, High Heat Resistance Oxygen Free Copper "MOFC-HR"**)

3. Decarbonization

- Developing products that contribute to GHG reductions for customers (**Copper Alloy for Automotive Small Terminals – MSP®5**)
- Developing processes & manufacturing methods that eliminate or reduce GHG emissions (**New Development of a Titanium Electrode for Electrolysis**)
- Medium- to long-term development of individualized technologies such as GHG separation and capture, conversion, and storage (**CO2 Recycling**)
- Building carbon recycling systems

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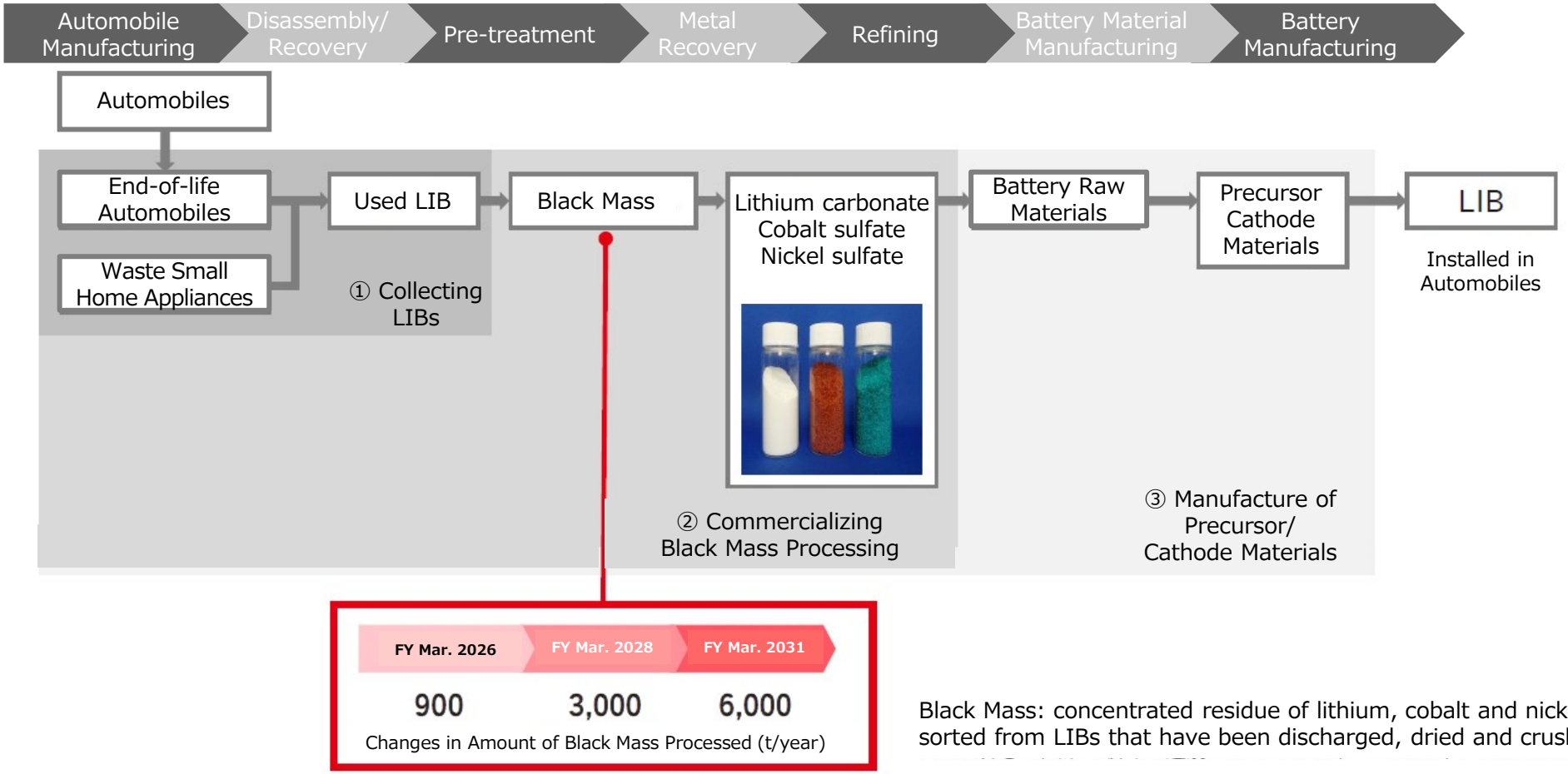
R&D Topics - Recycling Activities / LIB Recycling -

- We are achieving global competitiveness through rapid development of a comprehensive recycling process for producing lithium-ion materials from LIBs, using the network we built through our E-Scrap business to collect Black Mass, and efficiently recovering lithium carbonate, cobalt sulfate, and nickel sulfate from Black Mass.
- We are broadening our business fields by expanding into recovery of LIBs from end-of-life vehicles (①) and commercializing Black Mass processing through collaboration with other companies (②), as well as expanding into producing precursor and cathode material (③).
- We are establishing a pilot plant inside the Onahama Smelter & Refinery (Onahama Smelting & Refining Co., Ltd.), located in the city of Iwaki, Fukushima Prefecture, where we are working to develop further technology in order to commercialize the high-efficiency recovery of rare metals from Black Mass. (Pilot plant scheduled for operation in 2025.)



Black Mass: concentrated residue of lithium, cobalt and nickel sorted from LIBs that have been discharged, dried and crushed.

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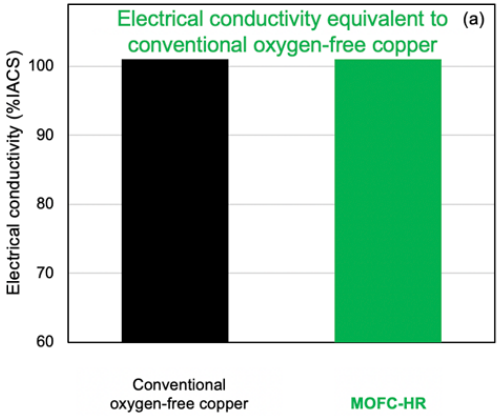
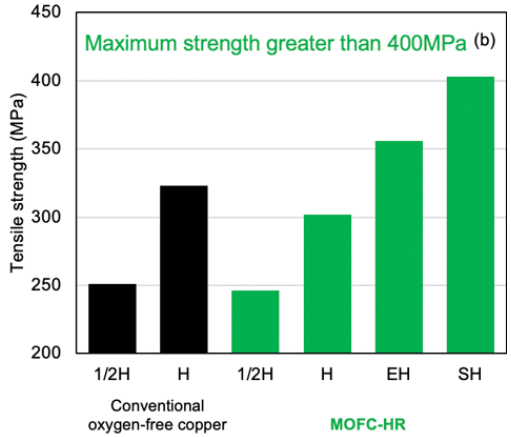
R&D Topics - Resource Recycling Initiatives ／ Oxygen-free copper with high strength and high heat resistance 「MOFC-HR」-

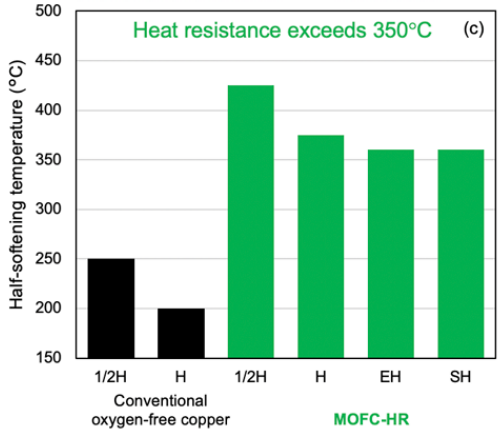
Development of "MOFC-HR" (HR: Heat Resistance)

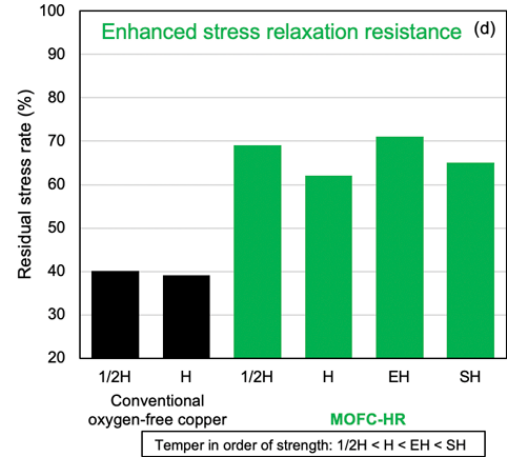
Oxygen-Free Copper with the World's Highest Standard in Strength and Heat Resistance

- Instead of a copper alloy with other elements added in, we developed MOFC-HR (Mitsubishi Oxygen-Free Copper - Heat Resistance), an entirely new oxygen-free copper with strength and heat resistance that have been enhanced to match world-class standards.
- MOFC-HR has superior recyclability, and maintains electrical and thermal conductivity equivalent to conventional oxygen-free copper, while achieving extremely high strength and greatly increased heat resistance, and also a high level of stress relaxation resistance (a characteristic indicating the resilience of a spring).
- MOFC-HR's superior properties enable its use in a wide range of applications with less degradation even in environments with high thermal loads, making it ideal for electrical components that are required to accommodate large currents and offer high heat dissipation under harsh environmental conditions, such as in EV and next-generation energy applications.









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R&D Topics - GHG Reduction Efforts / MSP®5 Copper Alloy for Automotive Small Terminals -

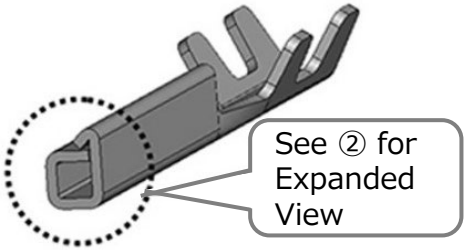
Development and Full-Scale Production of MSP®5, a Copper Alloy with World-Leading Magnesium Levels

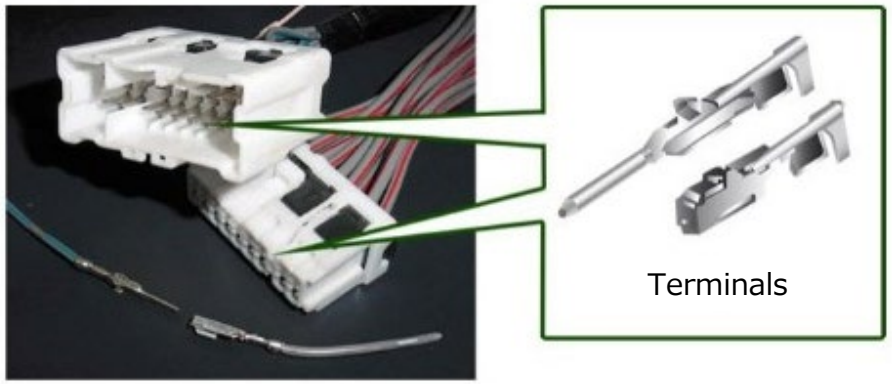
Our Proprietary MSP®5 Received the 2021 Technology Award from the Japan Copper and Brass Association

- We developed an alloy with the high strength, electrical conductivity, and stress relaxation resistance (the resilience of a spring when heated) required for materials used in automotive electrical components, which also has excellent formability, minimizing the risk of cracks and fractures during forming, particularly for box-shaped terminals.
- As a solid-solution strengthened copper alloy*1, MSP®5 can be manufactured using a simpler process than that for precipitation strengthened copper alloys*2 which require complicated heat treatment.
- This makes it possible in principle to reduce CO_2 emissions during manufacturing.

*1: Solid-solution strengthening: a method of strengthening a material by dissolving other atoms (solute atoms) into the matrix of parent atoms (solvent atoms).
*2: Precipitation strengthening: a method of strengthening a material by precipitating other atoms (solute atoms) within the matrix of parent atoms (solvent atoms) following solution treatment.

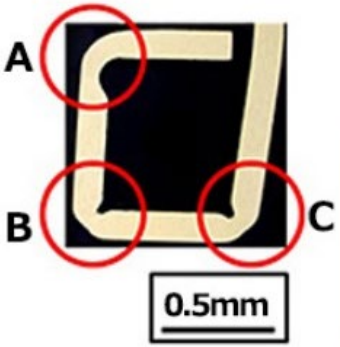
① Automotive Terminal – Schematic Diagram

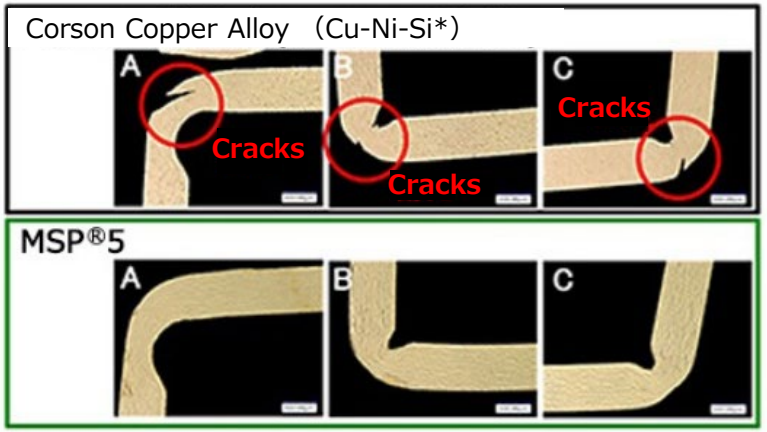




Example Application for MSP®5: Automobile Connectors

② Results of Formation into a Terminal





*Comparison with existing MMC Group product

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R&D Topics - GHG Reduction Efforts / New Development of a Titanium Electrode for Electrolysis -

Developing a New Titanium Electrode with a Double-Layer Structure Using 3D Printer Technology
- Novel Material that Supports Efficient Hydrogen Production at High Current Densities -

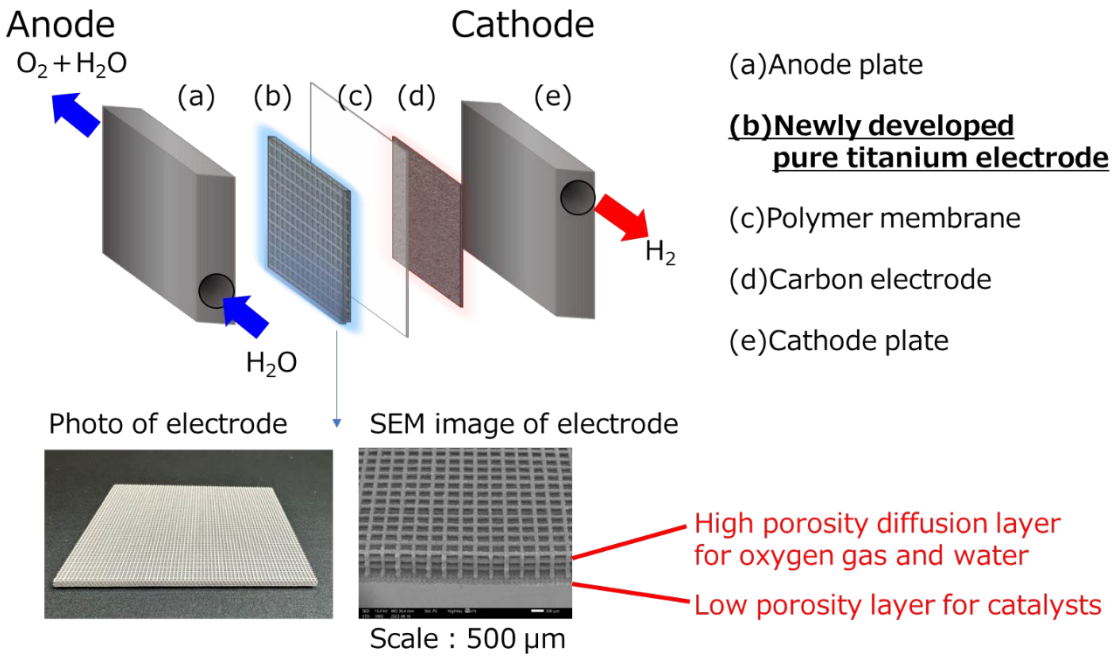
- In conjunction with the group led by Yokohama National University's Shigenori Mitsushima (Professor at the Faculty of Engineering and Director of the Advanced Chemical Energy Research Center, Institute of Advanced Sciences), we have developed a new titanium electrode for electrolysis which is capable of highly efficient operation even under high current density conditions.

【Background】

- Demand for hydrogen as a form of green energy is rising, and polymer electrolyte membrane (PEM) electrolysis is gathering attention as a hydrogen production technology, though a challenge is its high system cost.
- Therefore, Yokohama National University, which has been entrusted with the Advancement of Hydrogen Technologies and Utilization Project by NEDO and has cutting-edge electrode evaluation technology, and MMC, with our sophisticated titanium sintering technology, began working together on the development of a new titanium electrode for electrolysis.

【Development Overview & Outlook】

- Applying our original powder sintering technology of pure titanium to 3D printer technology, we achieved the formation of a new double-layer structure with a layer for electrolysis and a diffusion layer for oxygen discharge.
- Electrolysis is possible even with high current density (over 4 A/cm^2; typical: 4 A/cm^2). Further, hydrogen production costs are lowered by reducing the amount of precious metal catalysts, etc. required.
- We will continue developing & prototyping to optimize electrode structures for practical use.



PEM Electrolysis – Schematic Diagram

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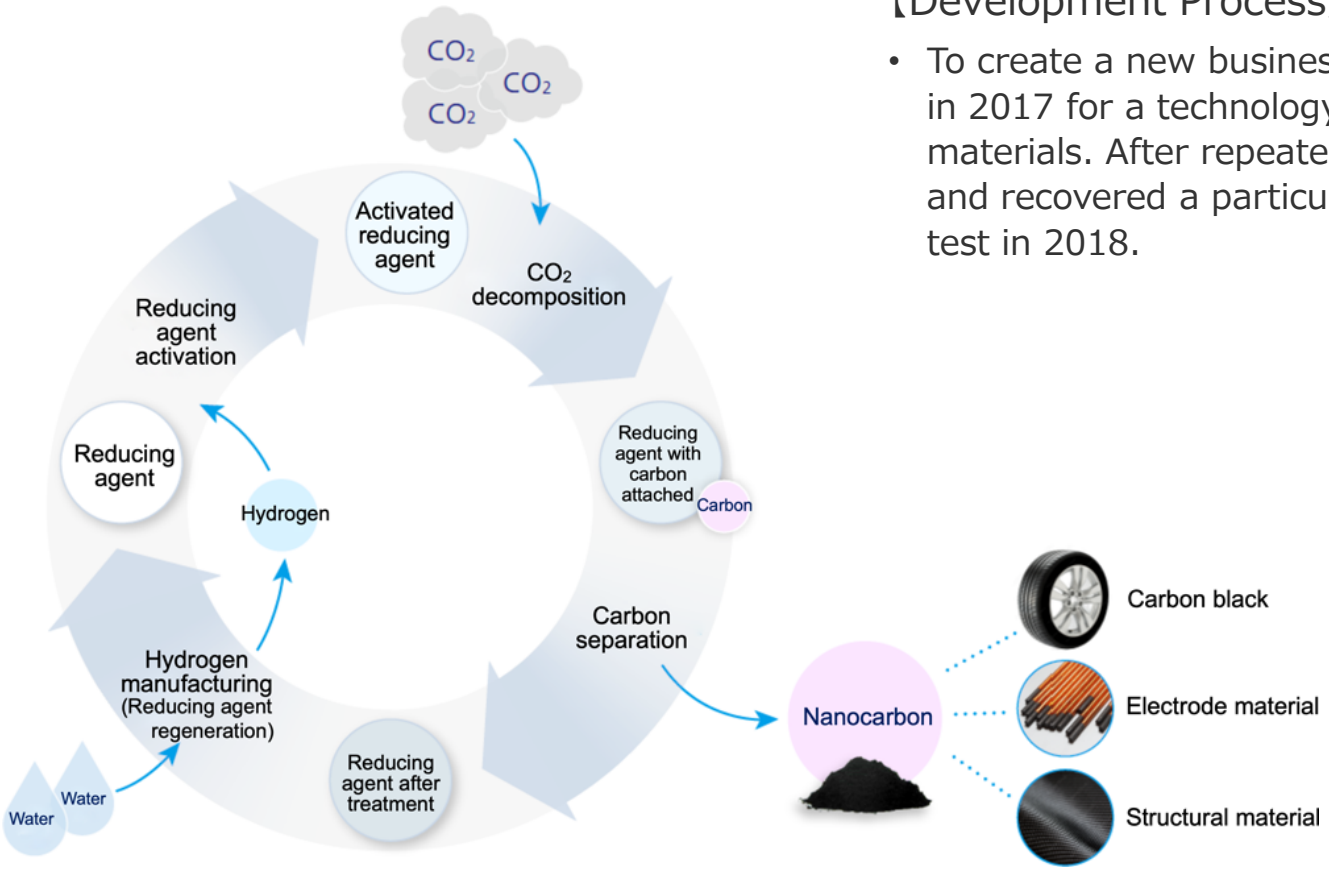
R&D Topics - Carbon Recycling Efforts / CO2 Recycling -

Carbon Recycling Technology Adopted as an R&D Project Commissioned by NEDO - Accelerating Development and Application of New CO_2 Reuse Technologies -

The carbon recycling process we have developed was selected as one of the partner projects for "Development of Technologies for Carbon Recycling and Next-Generation Thermal Power Generation / Development of Technologies for CO_2 Reduction and Utilization" by Japan's New Energy and Industrial Technology Development Organization (NEDO), with the title "Development of Carbon Material Manufacturing Technology by Chemical Decomposition of Carbon Dioxide."



【Development Process】

- To create a new business aimed at carbon neutrality, we began R&D in 2017 for a technology to decompose CO_2 for recycling into carbon materials. After repeated testing, we successfully decomposed CO_2 and recovered a particulate carbon nanomaterial in a beaker-scale test in 2018.

【Working Towards Commercialization】

- This commissioned project will span five years from FY March 2022 to FY March 2026, during which we will study feasibility through development of basic technologies, process optimization, expansion of carbon applications, and economic analysis. We aim for practical application around 2030, after verification testing on a larger scale.
- The project is currently proceeding as planned.

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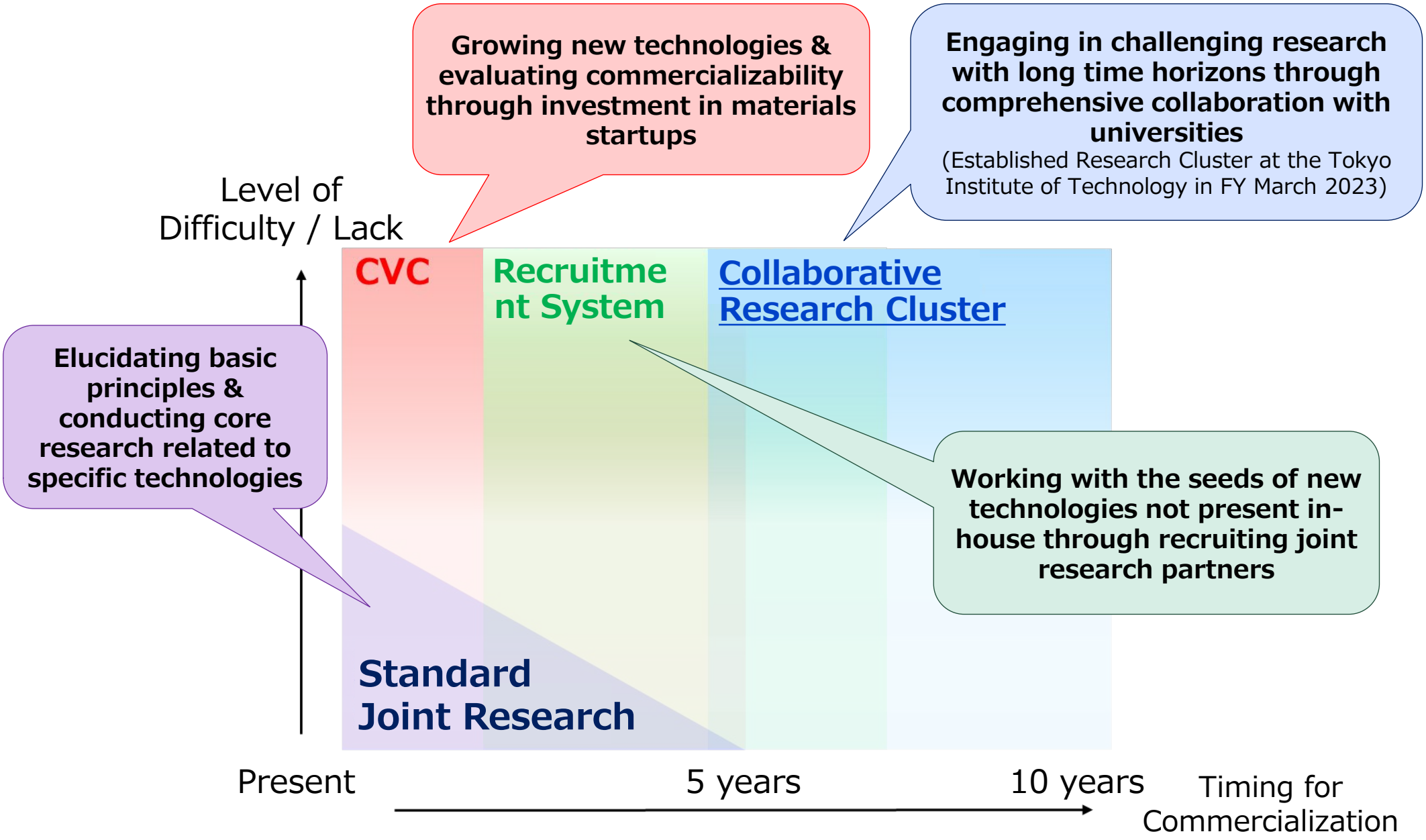
R&D Strategy - External Collaboration / Overview -



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R&D Topics - External Collaboration / Establishing a Research Cluster at the Tokyo Institute of Technology -

➢ Major Collaboration with a Top University Looking to the Next Decade

Mitsubishi Materials Sustainability Innovation Collaborative Research Cluster

- **Research Subjects** Innovative materials and processes that contribute to a sustainable society
- **Research Goals** Creating innovative materials and processes which contribute to a sustainable society, based on the concept of Green Transformation (GX), through collaboration on research that would be difficult for MMC to conduct independently
- **Research Focuses** Materials and processes related to composites, next-generation batteries, CO2 utilization, renewable energy, recycling / reuse, etc.
- **Period of Activity** September 7, 2022 – March 31, 2026

FY Mar. 24 Progress

- Research progressed under 8 themes, including next-generation battery materials and CO_2 utilization, and composites.
- We mutually formed working groups under the topics shown to the right, and examined research themes.

FY Mar. 25 Plans

- Begin R&D on research topics (currently 5) as they are designated by the working groups.

Working Groups		
Semiconductors	Shaping	Production Technology
Element Risks	Recycling	Energy

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R&D Topics - External Collaboration / CVC (Corporate Venture Capital) -

● CVC Overview

- In March 2019, we partnered with JMTC Capital G.K. (a 100% subsidiary of Japan Material Technologies Corporation) to establish the "MMC Innovation Investment Limited Partnership," a corporate venture fund with the objective of investment in venture companies with material technologies.
- Responding rapidly to societal changes, we engage in R&D actively incorporating cutting-edge technology at home and abroad with our own technologies; in the Medium-term Management Strategy, we see next-generation vehicles, IoT and AI as important societal needs, and we will proceed with creating and growing new products & businesses in this area.

● Companies Receiving Investments (As of March 2024) : Company, Technology & Product Overview

Company	Technology & Product Overview
Elephantech Inc.	Manufacture and sale of flexible circuit boards built using inkjet and copper plating technology
EneCoat Technologies Co., Ltd.	Manufacture and sale of Perovskite Solar Cells & related materials (Our activities with EneCoat Technologies are presented on the following slide.)
CONNEXX SYSTEMS Corporation	Development, manufacture, sales, planning, design, and system integration of next-generation power storage systems
Nature Architects Inc.	Provision of design algorithms making use of metamaterials, compliant mechanisms, and more
Immunosens Co., Ltd.	Development of immunosensors for point of care testing using Gold Linked Electrochemical Immuno Assay (GLEIA) technology

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R&D Topics - Green Energy Activities / Perovskite Solar Cell Materials -

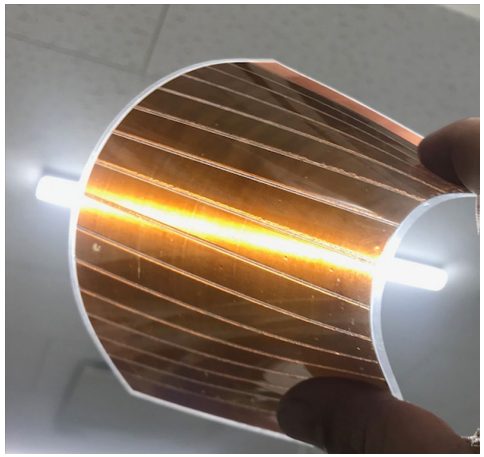
Investment & Additional Funding for EneCoat Technologies

Participation in NEDO's Green Innovation Fund Project/Development of Next-Generation Solar Cells

- Developing Peripheral Materials to Reduce Costs and Improve Performance of Perovskite Solar Cells -

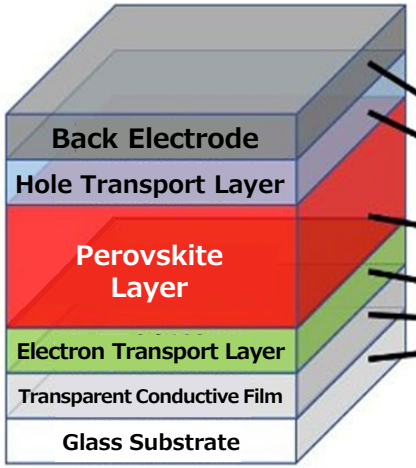
- Through the MMC Innovation Investment Limited Partnership*1, we are investing in EneCoat Technologies Co., Ltd., a company which aims to create viable perovskite solar cell products.
- We are collaborating with EneCoat Technologies to develop materials for the electron transport layer (a layer that functions to transport electrons generated in the perovskite to the electrode), and to promote the adoption of perovskite solar cells.
- EneCoat Technologies seeks to provide solutions in fields where thin-film solar cells are expected to make significant contributions (watches & wearable devices, rooftop power generation, ZEH / ZEB, solar cars, space development, solar planes, etc.).

*1 On March 1, 2019, we partnered with JMTC Capital G.K., a 100% subsidiary of Japan Material Technologies Corporation, to establish this corporate venture fund with the objective of investment in venture companies with material technologies.

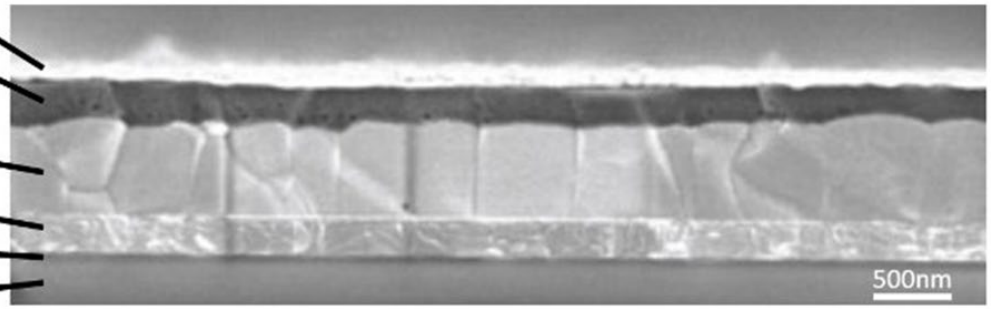


Perovskite Solar Cell Concept
(courtesy of EneCoat Technologies)

Perovskite Solar Cell Structure Example



Solar Cell Cross-Section (Electron Micrograph)



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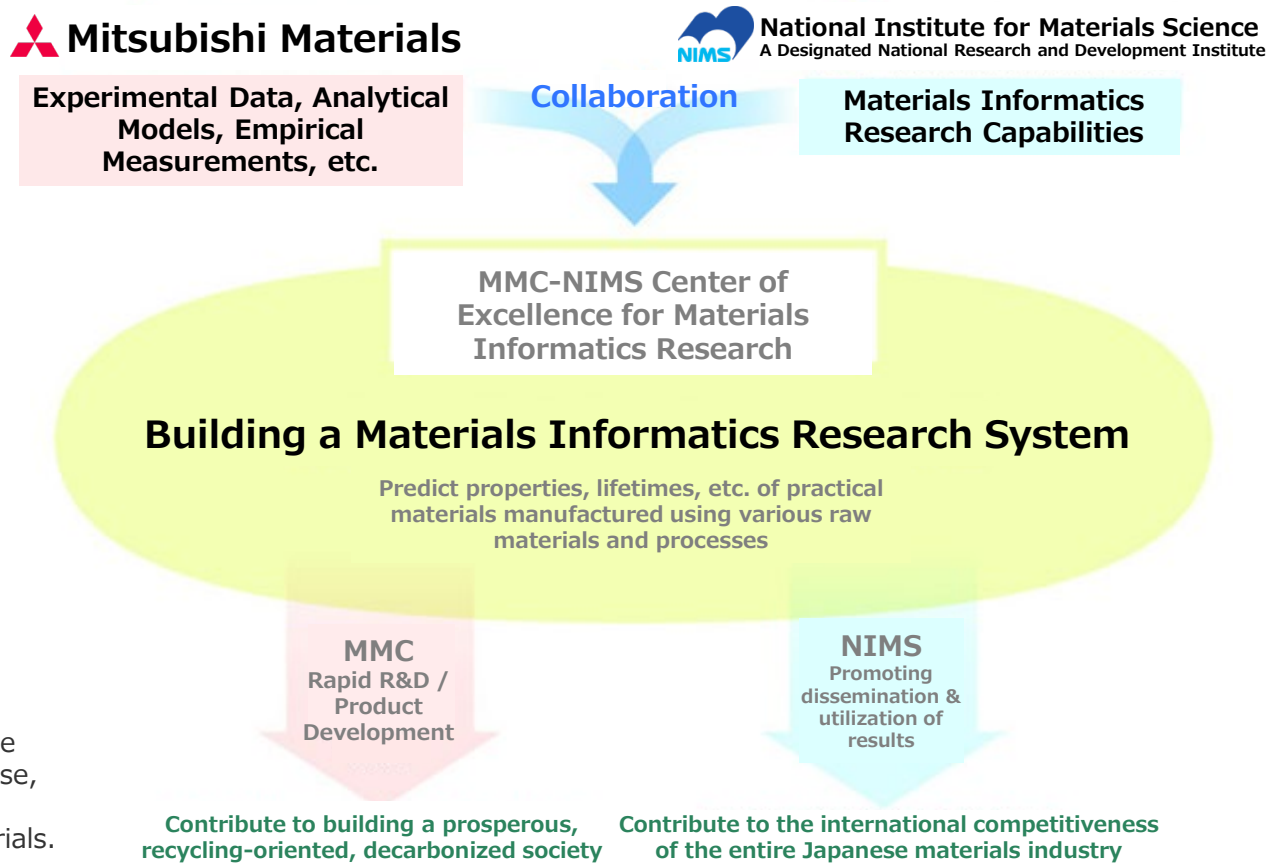
R&D Topics - External Collaboration / Materials Informatics (MI) -

Establishing the MMC-NIMS Center of Excellence for Materials Informatics Research

- Mitsubishi Materials Corporation ("MMC") and the National Institute for Materials Science ("NIMS") established the MMC-NIMS Center of Excellence for Materials Informatics Research.
- By combining various elements including MMC's experimental data, analytical models, and empirical measurements gathered through our materials development research, with NIMS's materials informatics research capabilities*1, we are building systems that can predict the properties, lifetimes, etc., of practical materials manufactured by combining various raw materials and processes. Specifically, we seek to have systems that can handle nonferrous metals, thin film materials, organic-inorganic composite materials, and more, by 2025.
- At MMC, we are furthering the enhancement of R&D and manufacturing processes that incorporate revolutionary technologies such as IoT, AI, and robotics. By creating this system with NIMS and incorporating it into our R&D, we aim to greatly reduce the time previously spent by humans on data collection and analysis.

【Results】
An example of our results is presented on the following slide.



*1 These research capabilities include the ability to combine various sources of information (data) with scientific expertise, including data science, computational science, theory, experimentation, and simulation, in order to develop materials.

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R&D Topics - External Collaboration / Materials Informatics (MI) -

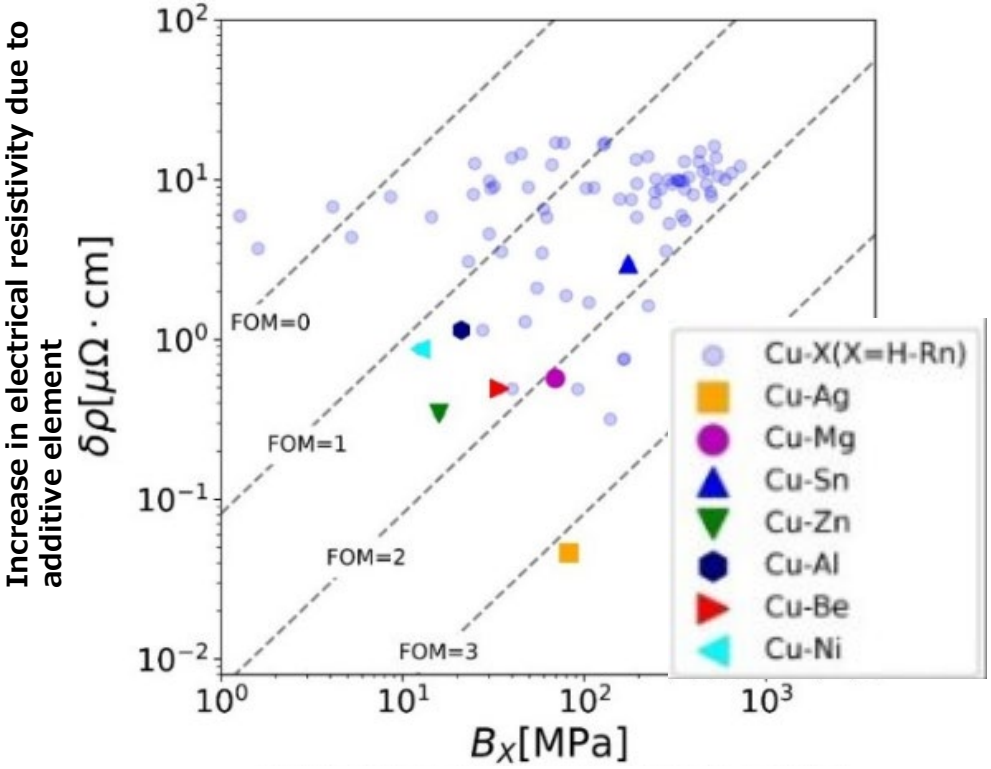
Building a Property Prediction Model for Copper Alloys
- Supporting the Superiority of Mitsubishi Materials' Magnesium-Copper Alloy MSP™ Series -

【Overview】

- Mitsubishi Materials Corporation ("MMC") and the National Institute for Materials Science ("NIMS") have developed a new property prediction model for copper alloys with an exhaustive range of 86 elements.
- The results of joint research using this model conducted by these two organizations show that magnesium (Mg) is the best element overall for creating copper alloys.
- These results are based on joint research conducted at the MMC-NIMS Center of Excellence for Materials Informatics Research (est. 2020). This work was achieved by combining MMC's copper alloy design and simulation technologies with NIMS' specialized "data-driven approach" – a materials development method based on data science.

【Research Results】

- The figure to the right shows the predictions for mechanical and electrical properties made using the property model.
- Alloys in the lower-right portion of the figure are superior because they possess higher mechanical strength while limiting increases in resistivity.
- The first five rankings are either high-cost or toxic. Cu-Mg has the best balance of properties, cost, and safety profile.



Increase in mechanical strength (yield strength) due to additive element

Figure 1. Relationship between mechanical and electrical properties of solid-solution alloys.

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Intellectual Property Strategy
- Our Commitment and Important Measures in the FY2031 Strategy -

Commitment through the FY2031 Strategy

1. To **build an optimal intellectual property (IP) portfolio** in accordance with the Group-wide business and development strategies
2. To **contribute to the creation of new businesses and the strengthening of existing businesses** by providing management & technical information based on **advanced IP analysis and research (the IP landscape)**
3. **To make strategic use of the Group's IP**

Important Measures

- Strategic dialogue
- IP formation following a strategic approach
- Establishing a PDCA cycle for IP activities
- Effectively utilizing dormant patents

*Strategic Dialogue
Business Divisions and Intellectual Property Division to share business and IP information with each other and use analysis of this information to incorporate IP perspectives into development and business policies

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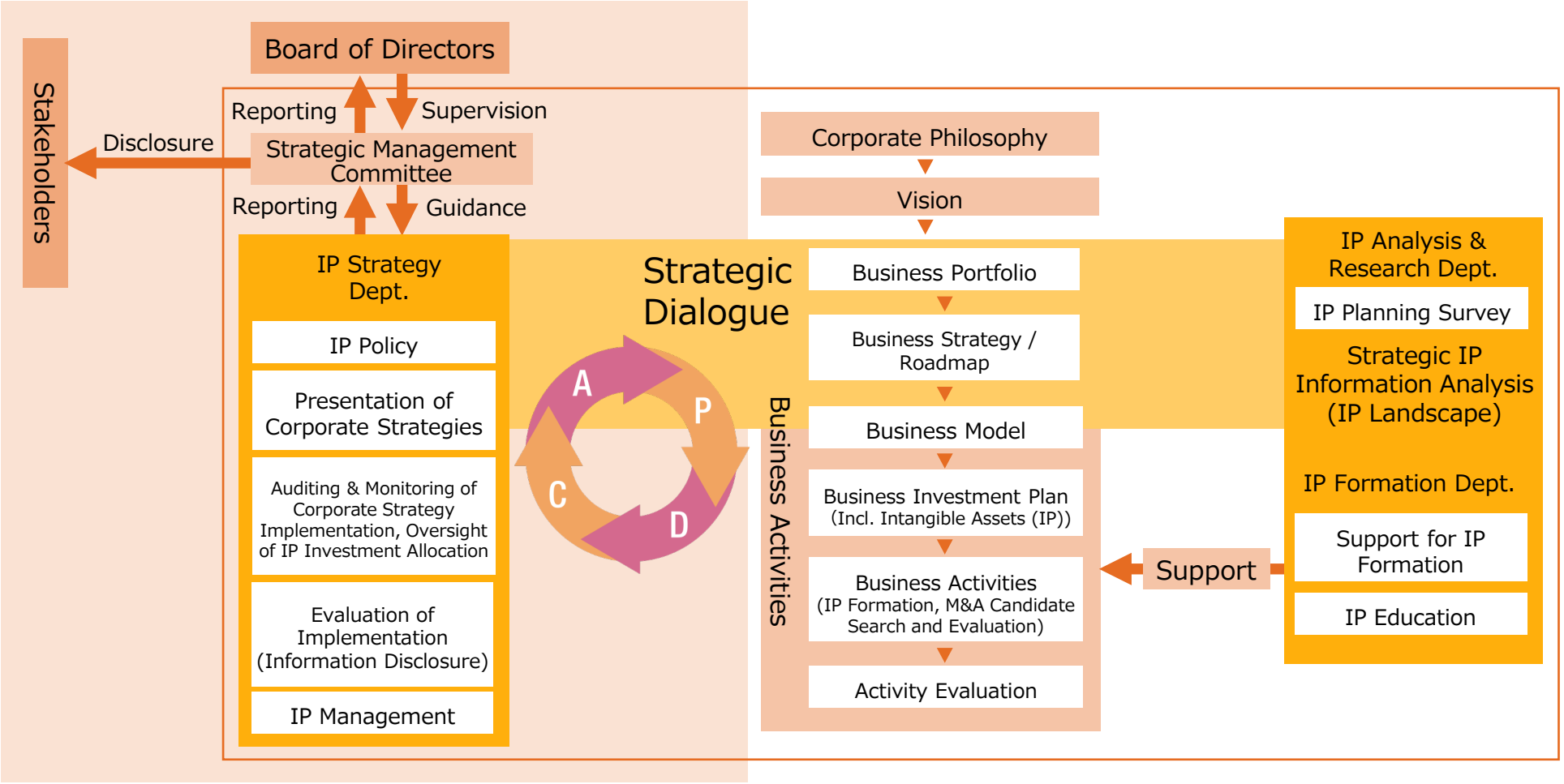
Intellectual Property Strategy - Governance Framework & Activities -

- Our governance framework for IP activities is presented in the figure below.
- We seek strategic IP formation, utilizing IP information analysis while promoting strategic dialogue between business and IP divisions.



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Strategic Dialogue Process

Understanding Our Business / Roadmap

General Information (Markets / Competitors / Technology)

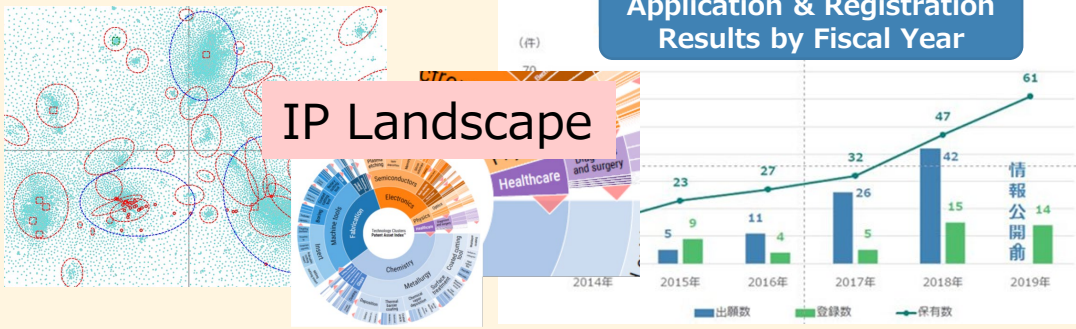
Specialized Information (Sales, Customers, etc.)

- Gain deeper understanding of the business strategy / roadmap through dialogue
- Clarify research targets

Business Strategy / Roadmap
- Markets
- Products / Businesses
- Technology

Data Analysis & Hypothesis

- Exploit the IP Landscape and
- ✓ interpret data & form hypothetical strategies
- ✓ evaluate proposed strategies



Incorporating IP Policy into the Business Strategy / Roadmap

Business Strategy / Roadmap
- Markets
- Products / Business / M&A Strategy
- Technology (Objectivity)
- IP Policy

New Businesses - Activity Overview -

Identify promising ideas from among many candidates, and continuously create & grow businesses while keeping use cases clearly defined

●Generate more themes ●Strongly promote commercialization ●Grow businesses

Challenges in New Business Creation and Measures Taken in Response

Challenges	Measures Taken
Increasing the number of themes	• Implementing internal venture (recruitment) system • Promoting the mindset through education and training • Appropriate allocation of development resources at the hypothesis evaluation stage
Strong promotion of commercialization	• Implementing stage gates that reflect lean startup methodology • Investing sufficient resources at the stage of preparation for commercialization • Developing & growing numbers of human resources who promote commercialization (CEO, etc.) • Utilizing external resources through the acceleration program • Implementing an industry-academia collaborative research recruitment program • CVC aimed at finding seeds
Growing (connecting) business	• CVC, M&A aimed at business development • Portfolio management for businesses to be developed • Top-down development of new businesses in fields of focus

- **Acceleration Program Announced in FY March 2024**
- **Carry out the measures shown here during Phase 1 of the FY2031 Strategy (2023 – 2025)**

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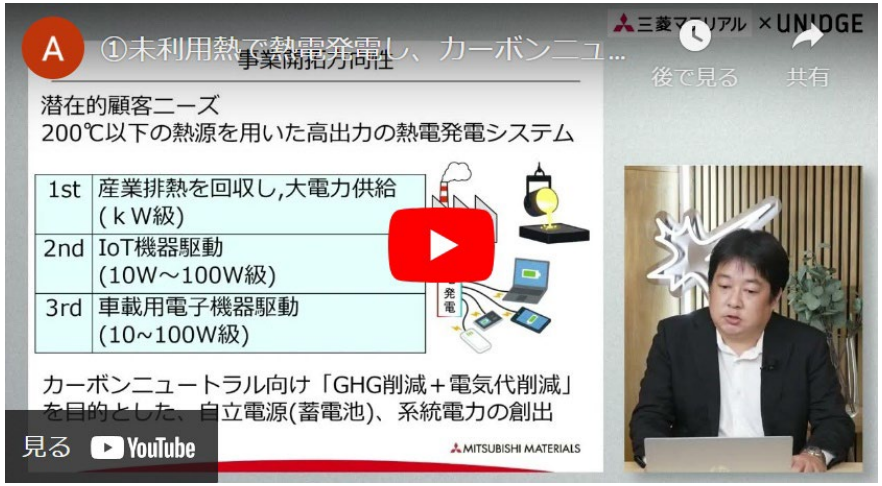
New Businesses - Utilizing External Resources -

Announcing the MMC Acceleration Program: Wild Wind

Wild Wind Landing Page



Discussion of a Theme by the Idea’s Presenter

Informational Gathering for the Program

We are recruiting and matching external partners under specific themes.

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New Businesses - Life healthcare Related／Topics -

New Company That Provides Dental Checkup Services for Health Insurance Operators Established

Mitsubishi Materials Corporation (“MMC”) established Dental Door Corporation (“Dental Door”) to provide the cloud-based dental checkup service, Smart Dental Checkup™, for health insurance operators (*1).

【Background to date 】

- Since December 2022, MMC has worked with Japan Dental Hygiene Association Corporation (Location: Meguro-ku, Tokyo, Representative Director: Junichi Sawai) on the feasibility of the cloud-based dental checkup service, Smart Dental Check up™. (*2)
- MMC decided to establish Dental Door and enter the business because based on pilot provision of the service and investigation of the business environment the business has been judged to have sufficient feasibility and potential. With the cooperation of Japan Dental Hygiene Association Corporation, MMC started the service in February 2024.

【 Business features and future plan】

- Smart Dental Checkup™ is a checkup service that digitizes the inside of the mouths of the examinees and that is intended for dental checkups conducted on groups such as workplaces.
- Digitizing such data will enable examinees to zoom in, zoom out and rotate 3D models of their teeth and gums on their smartphones so they can see every corner of their mouth, which was previously difficult to see directly.
- This business will be MMC‘s first full-scale initiative in the healthcare field and the company will work on the development of systems for use in the service, etc. to commercialize the business with the goal of achieving annual net sales of ¥5 billion as soon as possible.

Logo mark of Dental Door Corporation

Smart Dental Checkup™
smartphone website screen

（*1） Applies to health services provided by insurers such as health insurance associations, Japan Health Insurance Association and mutual aid associations.

（*2） Press release dated December 9, 2022
Commenced Investigation on the Commercialization of Dental Checkup Services for Health Insurance Operators
URL：https://www.mmc.co.jp/corporate/en/news/2022/news20221219.html

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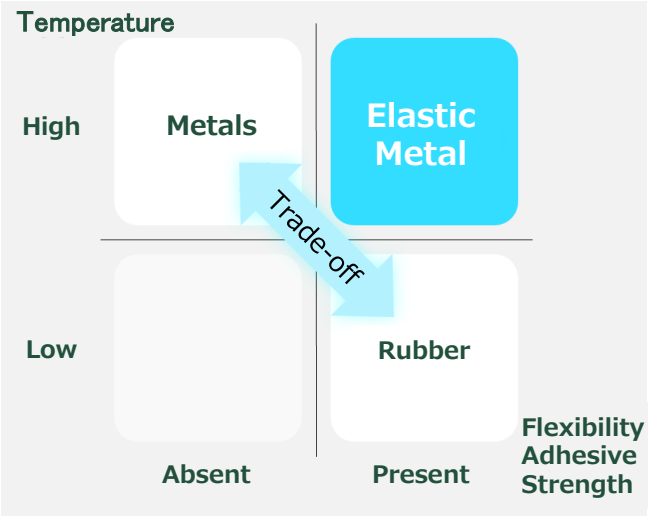
New Businesses - Metal Materials / Topics -

Developing Elastic Metal™, a Revolutionary Material with the Flexibility of Rubber

We have developed Elastic Metal, a revolutionary new material that can be used in the same kinds of high-temperature environments as metal while achieving the flexibility of organic materials.

【Issues We Hope to Solve】

Rubber and other organic materials are typically selected for applications that require flexibility, while metals are chosen for uses that require heat resistance. However, organic materials have lower heat resistance, so their uses are limited in high temperature environments, which necessitates trade-offs based on the characteristics of the material selected.

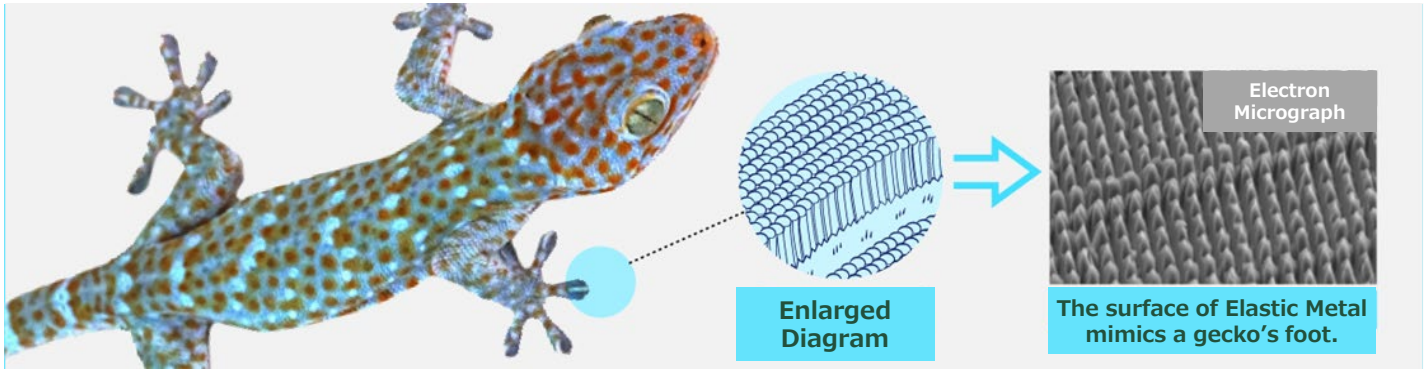


【Developing Solutions】

We began developing a novel material that could provide both heat resistance and flexibility. Taking inspiration from the adhesion mechanism of the stiff hairs on a gecko's foot, we applied the biomimetic surface enhancement technology currently under development within MMC to create specialized microstructures on metallic surfaces. The result was Elastic Metal, a material which can be used in the same kinds of high temperature environments as metal while maintaining the flexibility of organic materials.

【Future Applications】

We anticipate expansion into adhesion/temporary fixation applications where both high heat resistance and flexibility are required. In particular, we anticipate developing uses in fields including aerospace, semiconductors, and healthcare.



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DX Strategy

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Materiality

Materiality
Creation of a recycling-oriented society
Contribution to global environment
Sustainable supply chain management
Respect for human rights
Workplace safety and hygiene
Maintenance and improvement of governance
Retainment and utilization of human capital
Stakeholder communication
Deepening of DX
Initiatives to create new value

Key Themes	Main Initiatives	Objectives, etc.
Business process innovation	Thorough transition to paperless and seal less operation; promotion of consolidation and elimination of operations; utilization of IT tools and smartphones for innovation of our communications	Optimization of operations to ensure that the company continues to be one where each employee can actively engage in our fundamental operations; realization of a functional and agile organization with quick decision-making
Operational enhancement	Utilization of digital technologies such as IoT and AI to strengthen cooperation between the manufacturing and sales sides and achieve proactive quality management and take manufacturing capability to the next-level	FY March 2026 onward: Commencement of global demand management operations for cutting tools; gradual expansion sites and products By FY March 2031: Strengthening of manufacturing capabilities through measures such as improvement of processes and process technologies; conversion to smart factories
Acquisition of new added-value	Enhancement of customer contact points; reform of business model based on the needs of customers and society	FY March 2025 onward: commencement of service for selection of the best cutting tools; expansion of cutting solutions FY March 2026: Enhancement of supply chain by improving satisfaction of MEX users By FY March 2027: Enhancement strategies for each product through faster calculations of raw costs and visualization of granularity

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Four Management Reforms

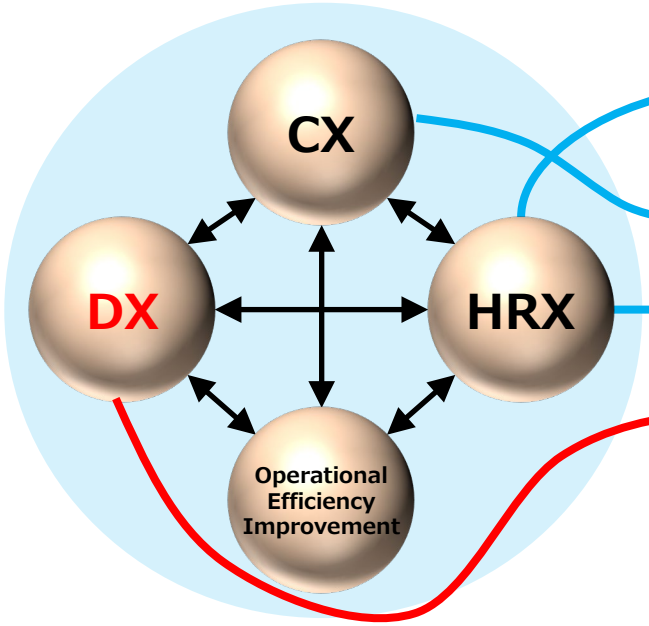
In light of environmental changes, we are pursuing the Four Management Reforms with the aim of further enhancing our organizational capabilities.

CX : **Reform into optimal form of group management (organization /business management)**
Strategic Headquarters ＋Professional CoE responsible for sophistication and efficiency
＋strong Business Division implementing autonomous management (in-house company)

HRX : **Reform of HR system and work style to acquire and develop autonomous talents who can adapt to changes**
① Introduction of Job-based HR System, ② Internal Job Posting System 、③Talent management, ④1-on-1 meetings、⑤ Next-Generation Leadership Talent Development

DX : **Reform through the use of utilizes data and digital technology**
Business added-value・Business operation competitiveness・Management speed

Operational Efficiency Improvement: Reform that reviews organizations, business processes and work styles



Targeting organization and corporate culture

① Organization with good and health communication where employees have unrestricted communication
② Organization capable of autonomously solving issues
③ Organization that adequately shares the understanding of its business
④ Organization that makes prompt and resolute decisions
⑤ Organization that manages its business with the awareness of the differences between product-type and process-type businesses
⑥ Organization that aims for thorough digitalization

Enhancing Organizational Capabilities

・Adaptability
The ability to adapt to shifting environments and nimbly change tactics

・Integration
The ability to take action by combining human connections and functions

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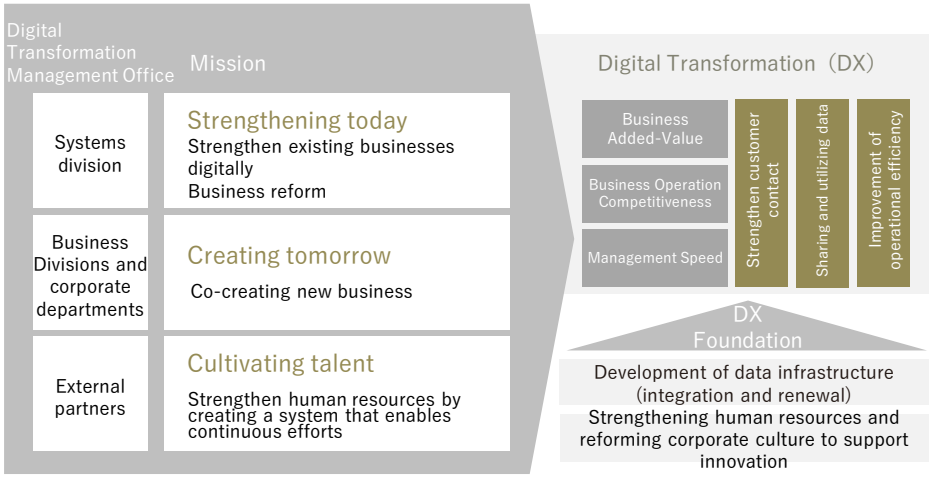
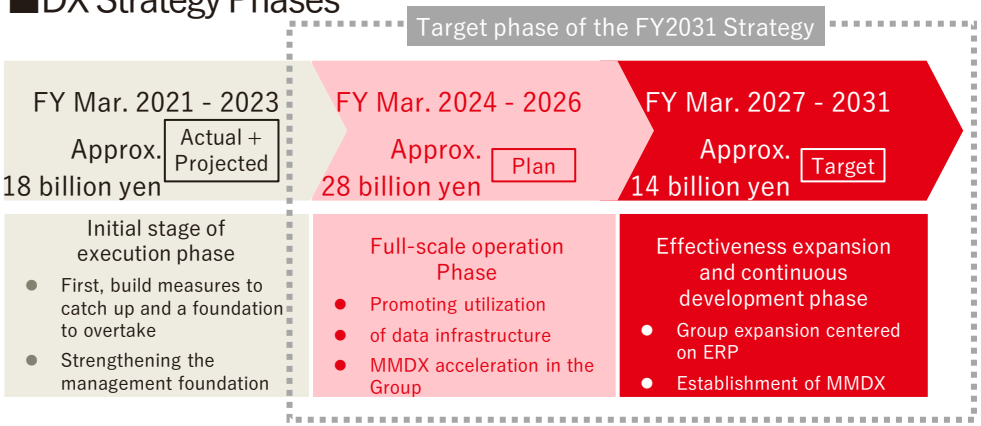
DX Strategy(MMDX*1)

DX Strategy

We are using data and digital technology to strengthen our three business pillars: added value, operational competitiveness, and management speed.

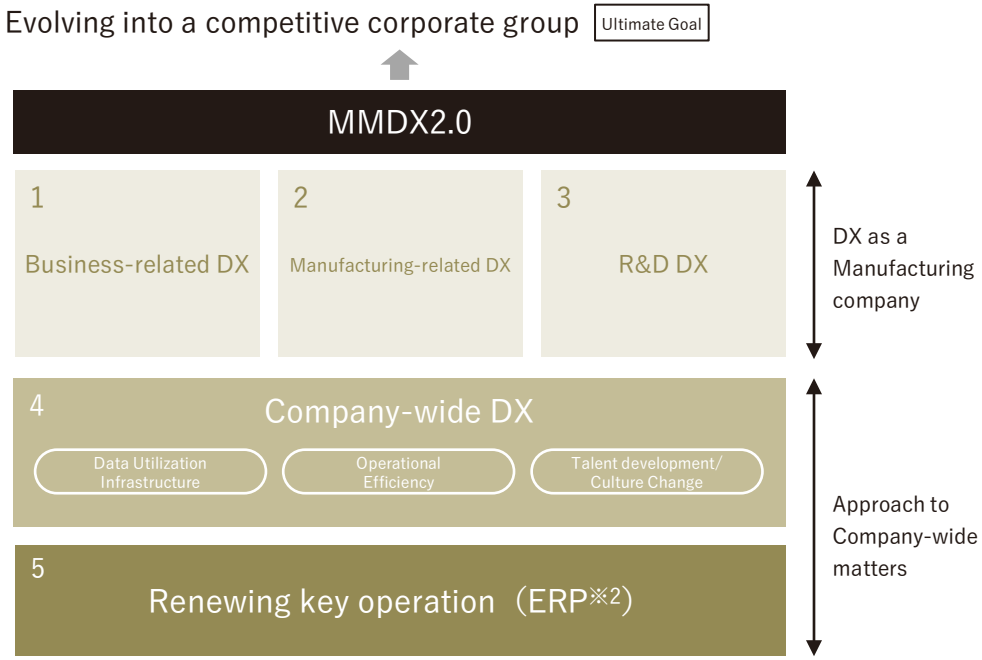


■DX Strategy Phases



Efforts in MMDX 2.0

As over two years have passed since MMDX was launched, we needed to strengthen manufacturing and effectively implement existing themes, so we reorganized our DX themes and enhanced our system to move into a new phase with MMDX 2.0.



■Goals of MMDX 2.0

Strengthening the manufacturing area	Strengthening the execution system	Activation of bottom-up activities

* 1 MMDX　Mitsubishi Materials Digital Business Transformation　※ 2 ERP　Enterprise Resource Planning

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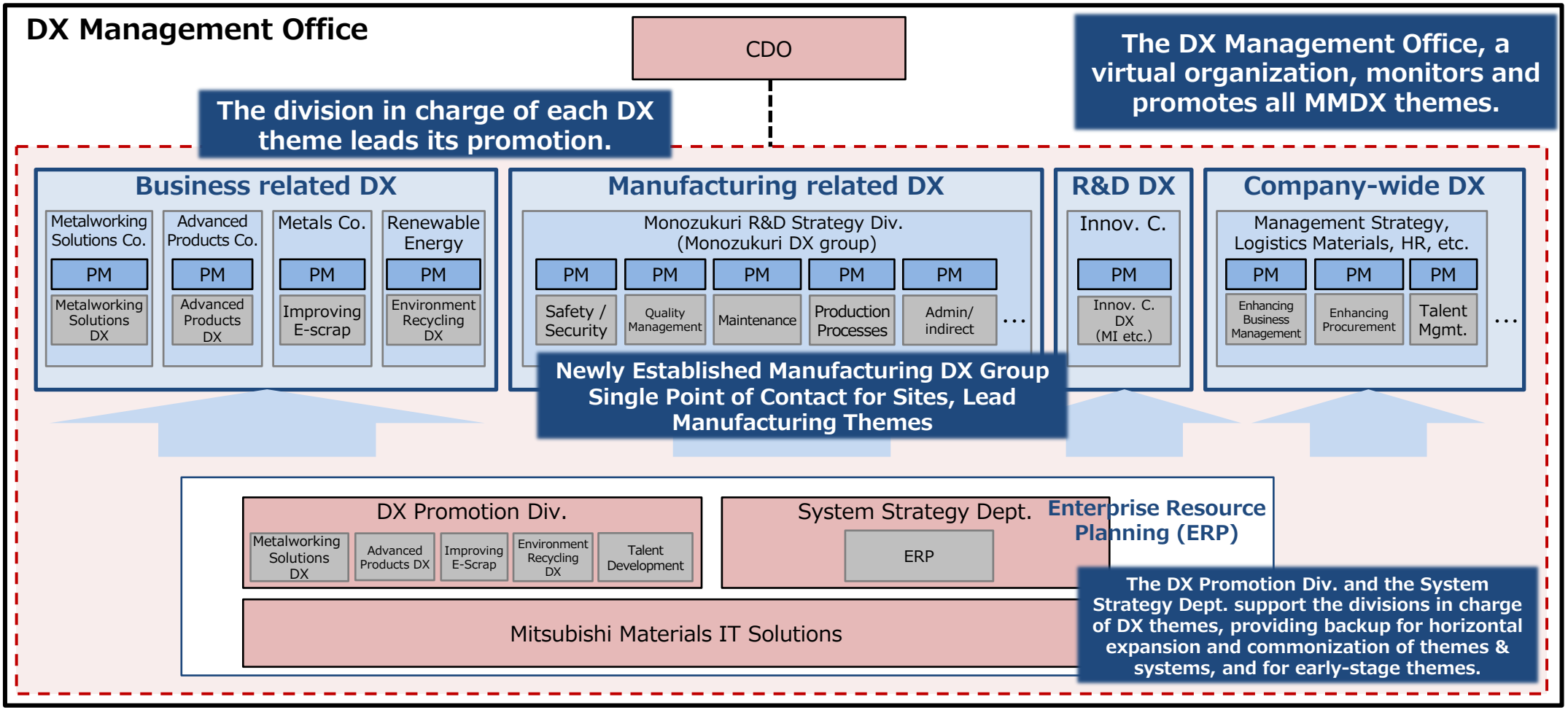
DX Promotion System

- The DX Management Office, a virtual organization with the CDO at its top, monitors overall MMDX including progress, issues, costs, resources, etc.
- The division in charge of each DX theme takes the lead on implementing promotion.
- The DX Promotion Div., System Strategy Dept., and Mitsubishi Materials IT Solutions support the divisions implementing DX promotion, and provide technical and HR backup for horizontal expansion and commonization of themes & systems, as well as for early-stage themes from worksites and new themes.



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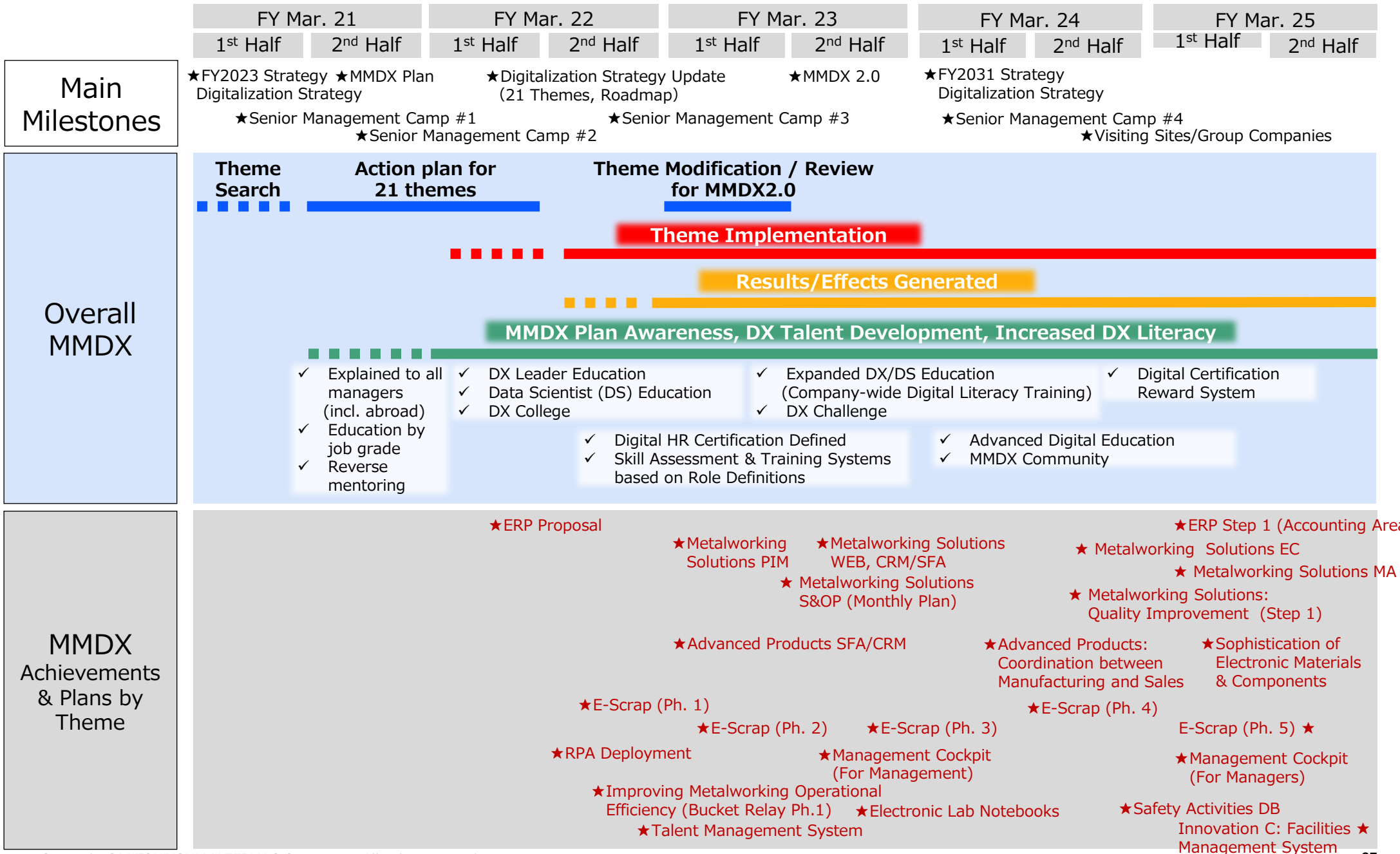
MMDX Master Schedule



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【DX Activities: Case 1】Metalworking Solutions Company DX｜Market Intelligence(MI)

Our Metalworking Solutions Company aims to provide the right services while increasing the sophistication of our business, based on a deep understanding of our customers.

① Deeper Understanding of Customers

We can rapidly, accurately, and effectively collect data from across the world at each digital point of contact.

\+ System for Global Data Collection, Analysis & Use

② More Sophisticated Business & Services

The data & information that we collect are used in many different departments.

Collecting Customer & Market Data

Data Entry / Storage / Analysis

Data Use

Benefits Felt by Customers

- We get info that matches our needs!
- We have closer contact with MMC sales reps!
- We get recommendations that match our needs!
- We can quickly buy the tools we need!

EC *1 — Online Tool Sales

Web — Information Sharing via Our Website

CRM *2 — Collecting, Aggregating, and Analyzing Customer Data

MA *3 — Automating & Improving Efficiency of Marketing

DTO *4 — Recommending the Right Tools to Customers

Metalworking Solutions C / Sales

《Accelerating Strategy Formulation》
More accurate, up-to-date data allow for rapid strategy formulation!

《Selecting Key Accounts》
Key Accounts are determined based on objective standards, and can be managed through a dashboard!

《Automated Report Generation》
Time saved on creating reports can be used for analysis or exploring new measures!

《Optimizing Development》
Products can be developed to match customer needs!

《Increasing the Accuracy of Demand Forecasts》
Demand forecasts become more accurate! Inventory status is improved!

Strategy Office | **Sales Office** | **Development Dept.** | **Plant, Manufacturing Office**

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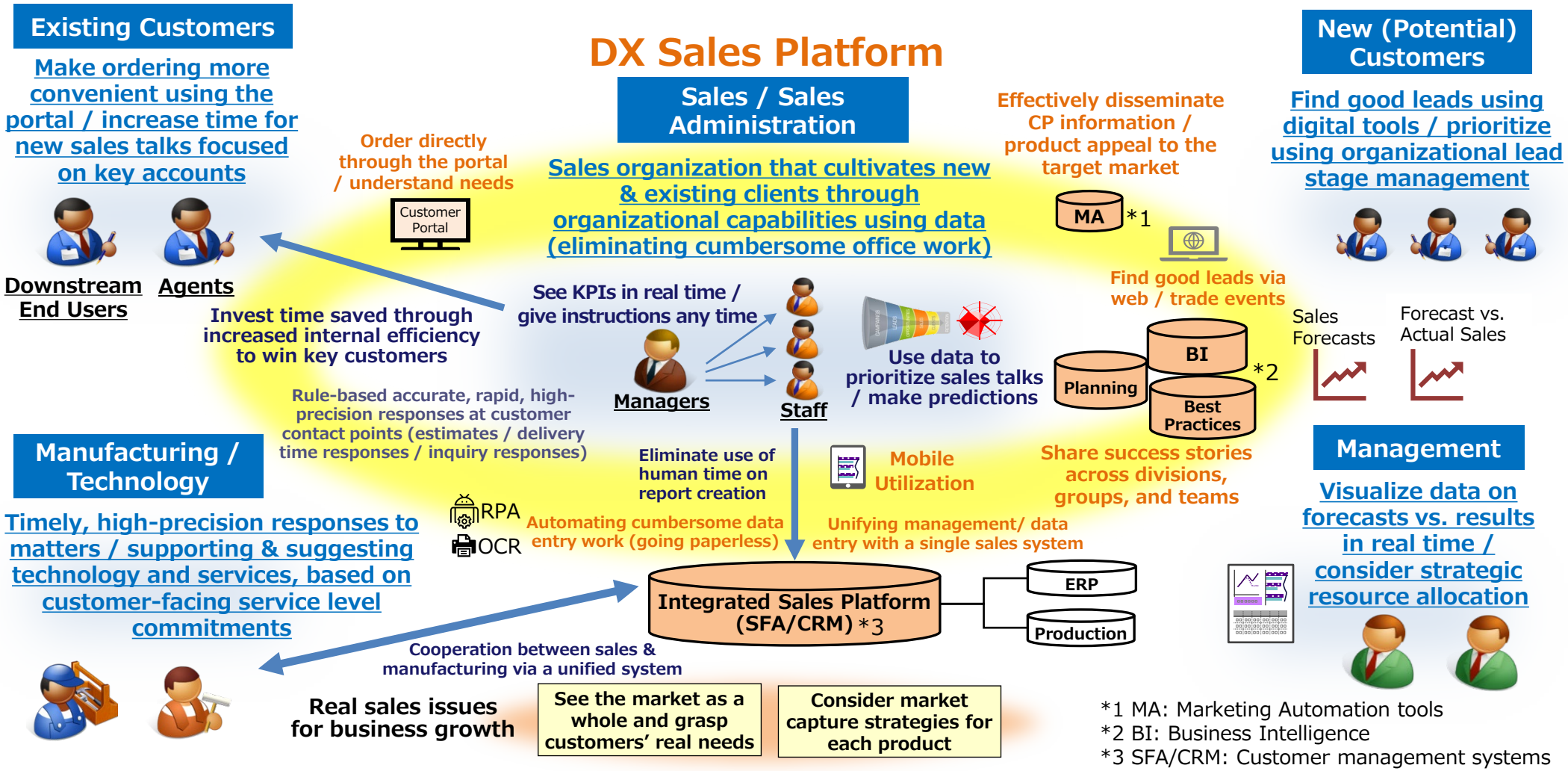
*1 EC: Electronic Commerce (online sales) *2 CRM: Customer Relationship Management system
*3 MA: Marketing Automation tools *4 DTO: Digital Tool Organizer (a solution option)

【DX Activities: Case 2】Advanced Products Company DX | Strengthening Customer Contacts

We are working to transform our organizational management style, shifting away from analog management that is dependent on individual ability to a management style that employs SFA/CRM solutions.



*1 MA: Marketing Automation tools
*2 BI: Business Intelligence
*3 SFA/CRM: Customer management systems

Key tools (CRM / workflow / BI tools) have been implemented and are in use.
We are now investigating the remaining improvement of connections with existing customers and approaches for new & potential customers.

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【DX Activities: Case 3】Metals Company DX | E-Scrap Platform

A New Platform for E-Scrap Trading

MEX Mitsubishi Materials E-Scrap EXchange

MEX seeks growth and expansion throughout the E-Scrap business by providing transparency and allowing for safe, trustworthy transactions

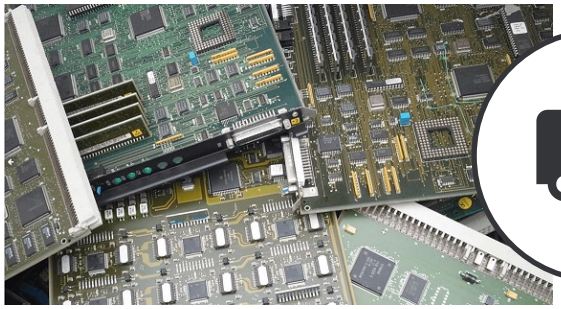
Operating since December 2021

Recyclers & Trading Companies

Is this valuation accurate?

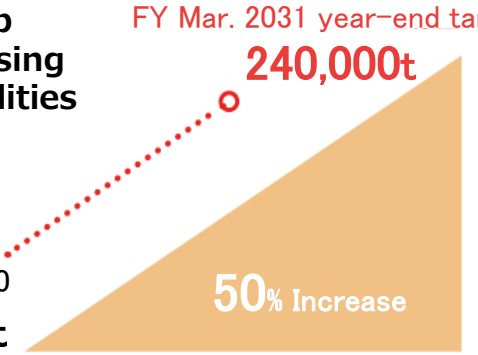
Mitsubishi Materials

Is this all the market has to offer?



MEX

E-Scrap Processing Capabilities



MEX connects us to our customers, forming closer partnerships

- **Full transparency!**
- **Accessible any time!**
- **Bidirectional service!**

What is E-Scrap?

E-Scrap is scrap that contains high concentrations of copper, precious metals, or other useful materials, e.g., discarded circuit boards from electronics such as household appliances and computers. It is a new source for raw materials (urban mining).

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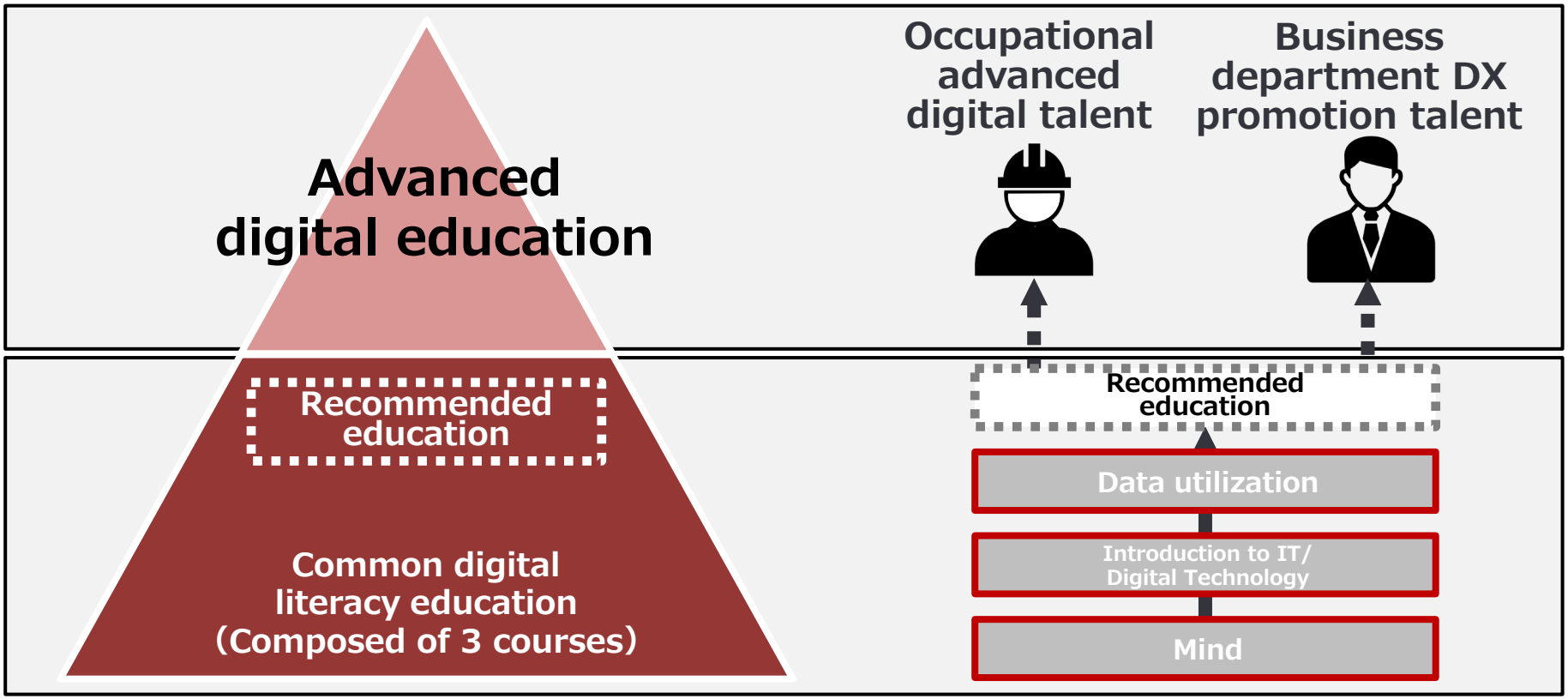
【DX Activities: Case 4】Organizational Culture and Talent Development (1/2) | Digital Education Overview

- Common Digital Literacy Education (“Common Education”) **aims to raise standards in order to encourage action** working toward transformation in which employees take ownership of DX / data-driven management. (Implemented company-wide as of July 2022.)
- In contrast, Advanced Digital Education aims to **develop talent with practical skills in order to promote DX / data-driven management** by further expanding the basic literacy fostered through the Common Education.



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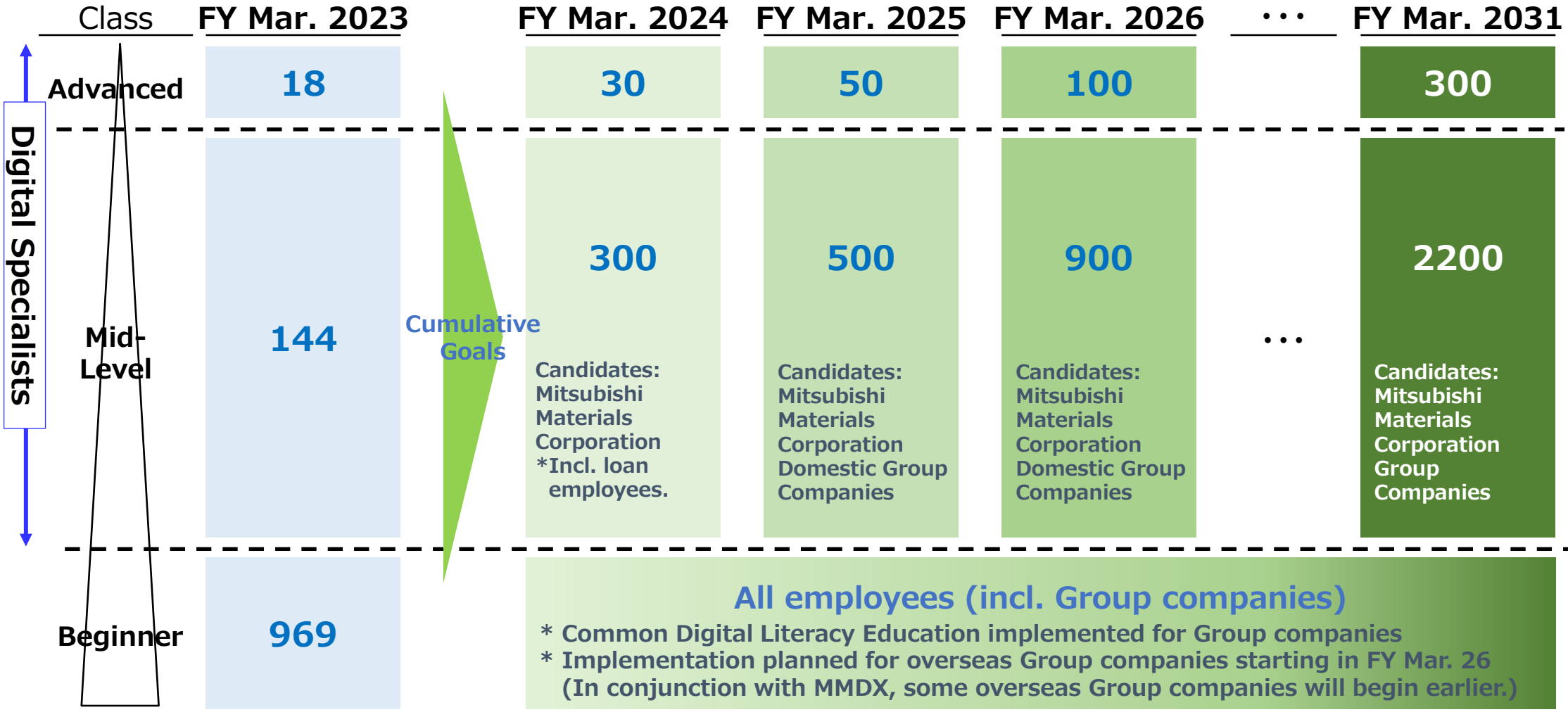
【DX Activities: Case 4】Organizational Culture and Talent Development (2/2) | Digital Specialist Development Goals

Target Level

We aim to have developed approximately 1,000 digital specialists by FY March 2026.

Yearly Plan



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IT Strategy

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Positioning in the IT Area

System related functions, which are indispensable to the business and provide the underpinning for DX promotion, are provided in the IT area.

We will proceed with new initiatives as we continue to provide safe, efficient system infrastructure.

ICT Tools

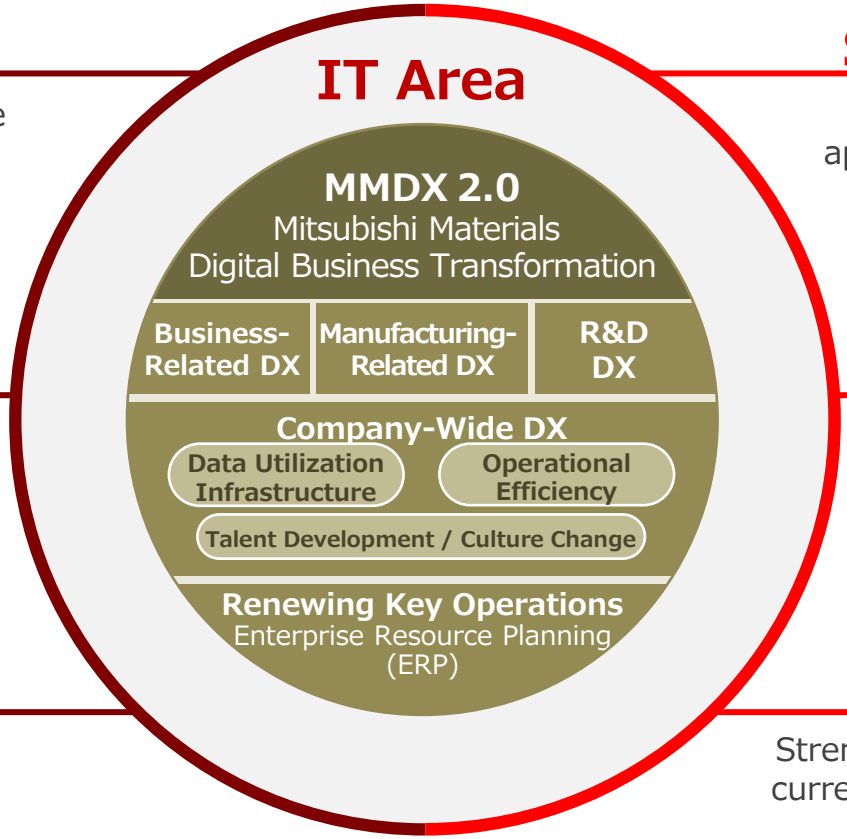
Providing a digital workplace to increase the productivity of all employees and promoting IT utilization

IT Infrastructure

Providing stabler, more efficient IT infrastructure to the whole Group through commonization & standardization

Securing IT Talent

Developing human resources with the expertise needed by business IT talent



System Modernization

Transitioning to architecture that is appropriate for data utilization, new work styles, and more

IT Organization Optimization

Reevaluating the role of the IT organization within the Group, including MMIS

Enhancing Security

Strengthening security measures in line with current trends, as external and other threats continue to grow

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IT Strategy

- To realize the MMC Group IT WAY, we promote IT modernization to support our businesses from the perspective of data utilization, work style, and security.
- We will invest on the order of ¥10 billion while keeping IT costs below 1.0% of net sales in FY March 2031. (Currently approximately 0.8%)

Policy on IT Initiatives	Major Measures
Establish & Execute the MMC Group IT WAY (IT Governance and IT Synergies)	**IT Governance = IT Security** ● Equalize global security levels and implement security measures appropriate for current global standards. ● Implement new network and cloud-based security for global common policies and Company-wide enforcement. **IT Synergy = Commonization / Standardization** ● Promote the utilization of data analysis infrastructure, cloud infrastructure, and IT services common to the entire Group.
Move from Legacy to Global Standard IT Infrastructure; Implement Appropriate Information Security Measures	● Gradually refresh systems developed with legacy technologies and move away from legacy architectures by approximately FY March 2031. ● Implement ERP starting in the accounting area to improve operational efficiency and data availability. ● Strengthen security measures against increasingly sophisticated external threats in both IT and OT.
Develop and Secure Experienced IT Talent Able to Work Effectively in the Market and Build an Optimal IT Organization	● Optimize the division of IT roles among Strategic Headquarters, Group Companies, MMIS, and External Partners. ● Governance and synergies (commonization and standardization), business support (individual systems), and execution functions. ● Develop career paths and education plans for IT talent to improve their expertise, while increasing IT talent by approximately 10% by FY March 2031.

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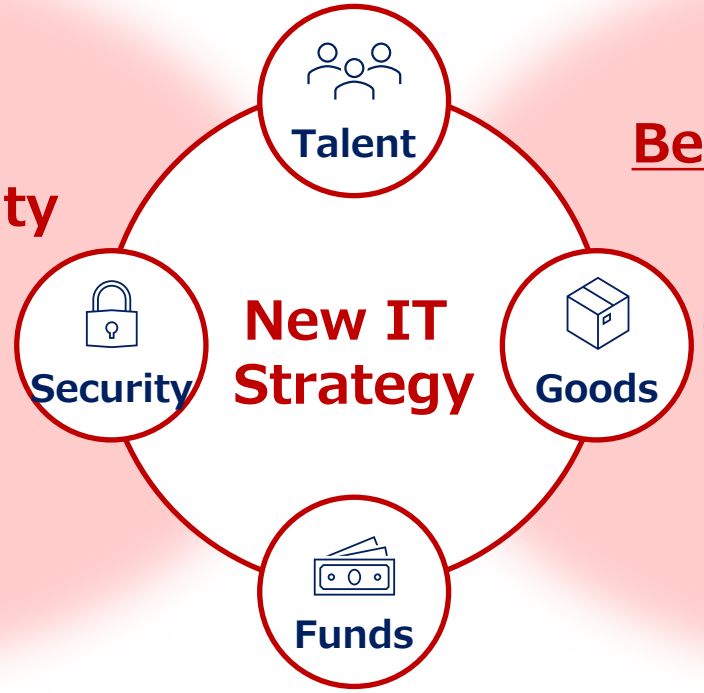
Basic Principles in the IT Area

In the IT area, our basic principles are the establishment of governance (IT security) and synergy (commonization & standardization).

IT Governance
Ensuring IT Security

Implementation is crucial to maintain security throughout the MMC Group



Benefits of IT Synergy

Reduce costs & eliminate resource waste by commonizing wherever possible

Principles of Global IT Governance

Establishing the MMC Group IT WAY

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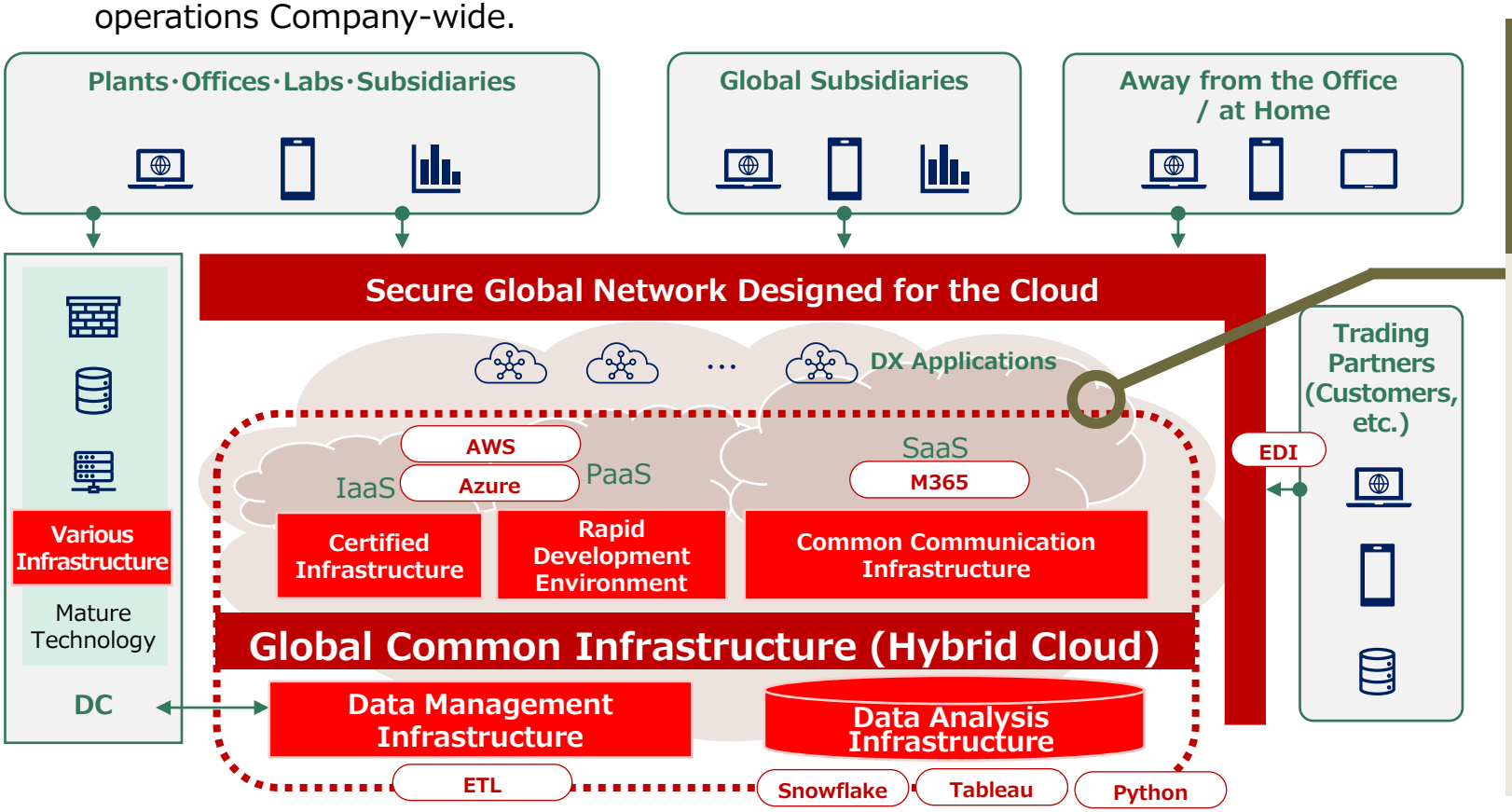
Goods Area: Establishing a New IT Environment (1/2)

We are establishing Company-wide common IT infrastructure to support our global businesses, making safe and effective use of the cloud.

Cloud-Based IT Infrastructure

- ❑ We are establishing secure networks for use by both our sites across the globe and by our customers, as well as common cloud-based infrastructure.
- ❑ We are establishing systems using common infrastructure within our many DX initiatives, including renewing key operations Company-wide.



We are renewing our key operations systems Company-wide, transitioning to cloud-based systems.

Renewing & standardizing operations processes for Group companies worldwide

ERP

Accounting

Sales / Distribution

Started Earlier

Common Worldwide

Standardized System

Realizing Application of Data across MMC

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Goods Area: Establishing a New IT Environment (2/2)

We are promoting modernization of our workplaces and business systems, as a way of promoting data utilization and supporting our businesses through work style improvements.

Workplace & Business System Modernization

- ❑ We initiated rapid modernization of our workplaces in conjunction with our response to the COVID-19 pandemic.
- ❑ We believe it is necessary to both realize further work style diversification and improve productivity, so we are proceeding with various modernization plans.

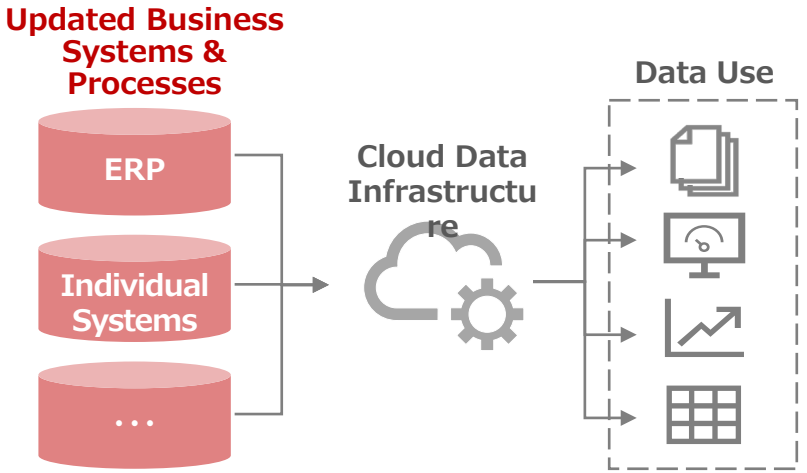
Increasing Workplace Sophistication while Balancing Diversity of Work Styles and Improved Productivity

- ✓ Increasing operational efficiency by taking advantage of the strengths of devices such as PCs and smartphones, and promoting internal communication
- ✓ Using generative AI to increase operational efficiency, competitiveness, etc.

- Strengthening the remote work environment
- Proactively utilizing generative AI
- Use of smartphones by all employees, including those at plants
- Strengthening our service team to promote IT utilization
- Deploying RPA to further increase operational efficiency
- Utilizing no-code and low-code tools to improve productivity

Updating Business Systems & Processes to Further Data Utilization

- ✓ Strengthening data management through architecture optimization, etc.
- ✓ Transitioning to business systems & processes designed for data utilization, etc.



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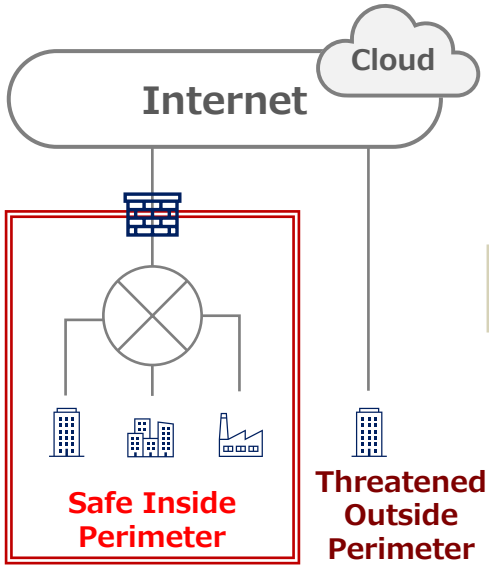
Security Area: Efforts to Maintain Security

In order to maintain security for our systems, we are implementing appropriate IT security measures worldwide, responding to changes in the external environment, etc.

Implementing IT Security Measures

- We are transitioning from a **perimeter defense**-based security system to a **zero trust security** model, and strengthening our supply chain risk management measures, etc.
- We will continue to develop appropriate IT security measures in response to changing trends, from a global perspective.

Perimeter Defense Security



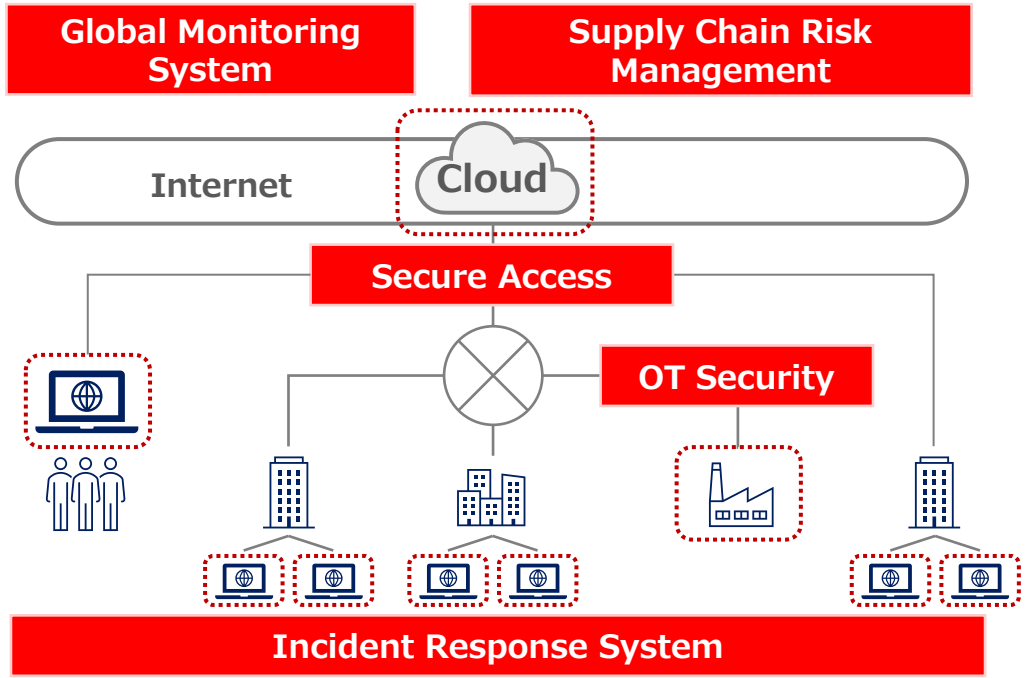
External threats grow with increased external interconnectedness.

Societal Demands for Security Governance

Growing Importance of Protecting OT

Technical Progress in the Security Field

Zero-Trust Security



Security Measures / Developing Operations under Global Common Policies

Ongoing IT Security Measures Responding to Changing Trends

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Funds / Talent Area: Optimizing Resource Allocation by Reevaluating the Division of Roles

We have consolidated IT talent and know-how into one company providing IT functions to efficiently utilize resources as the Group-wide IT operations unit.

Strategic Headquarters / Companies can put their efforts into IT strategy, seeking management and business success.

Pursuing IT Strategy that Contributes to Management / Business

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Formulating & Promoting IT Strategies that Pursue **Synergy & Governance**

Strategic Headquarters

- System Strategy Department
- DX Promotion Department

Formulating & Promoting IT Strategies that Aim to Contribute to **Business Results**

Advanced Products C	Metalworking Solutions C	Metals C
Systems Division	Systems Division	Systems Division
Sites / Group Companies	Sites / Group Companies	Sites / Group Companies

Consolidating IT Talent & Know-How into a Group-Wide IT Operations Unit

Mitsubishi Materials IT Solutions

Pursuing **Practical Ability and Specialized Technologies** in order to Realize the IT Strategy

Business System Group
- ✓ Develop business applications
- ✓ Support data utilization, etc.

Company-Wide System Group
- ✓ Company-wide core systems
- ✓ Company-wide ICT services, etc.

Platform Group
- ✓ Cloud infrastructure, data infrastructure
- ✓ Authentication infrastructure, etc.

Technology Group
- ✓ Utilize latest technologies
- ✓ Standardize technology, etc.

Service Management Group
- ✓ Service desk
- ✓ Promote IT utilization, etc.

Security Group
- ✓ Cyber security
- ✓ OT security, etc.

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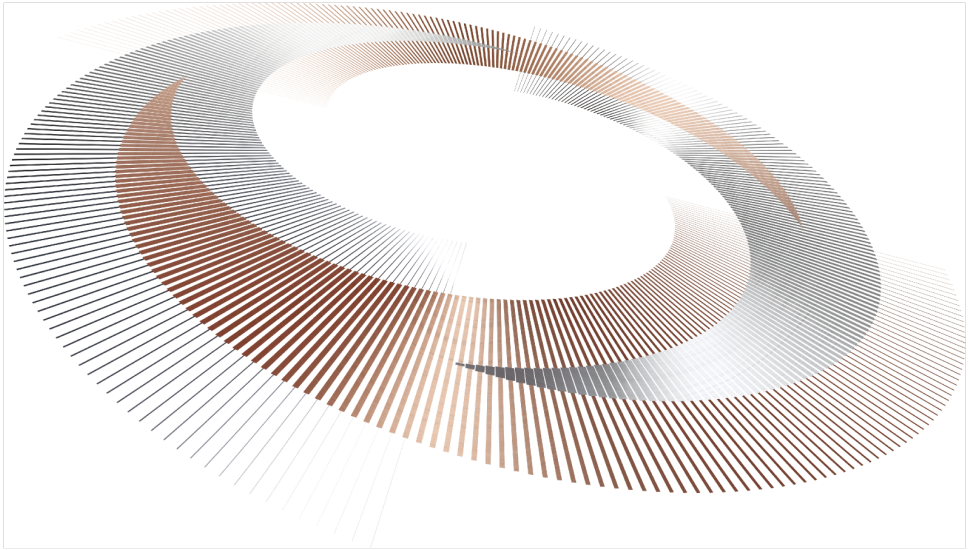

For people, society and the earth, circulating resources for a sustainable future

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