

SUSTAINABILITY REPORT 2022



We contribute to the development of a sustainable economy and society through innovation in the areas of resources and materials.

JX Nippon Mining & Metals Group Code of Conduct

1. Our social mission

Based on continuous technological development and full awareness of our responsibilities in designing products, we will develop and produce a variety of products efficiently while minimizing waste. At the same time, we will promote recycling and reduce the impact of our operations on the environment. By doing so, we hope to obtain the satisfaction and trust of our customers and of society as a whole.

2. Compliance with laws and regulations and engagement in fair trade

We will comply with domestic and/or overseas laws and regulations, and will engage in fair, transparent and free competition and trade based on the fulfillment of our social responsibilities.

3. Disclosure of corporate information and protection of personal information

We will communicate not only with our shareholders, but also with the public at large, and will disclose corporate information in an active and equitable manner while focusing on the protection of personal information.

4. Creation of an optimum health, safety and working environment

We will place top priority on health, safety, and disaster prevention and will ensure a comfortable working environment that respects employees' personality, human rights, and individuality.

5. Environmental conservation

Based on the awareness that tackling environmental issues is an essential requirement for corporate existence, we will engage in activities aimed at conserving the global environment, including biodiversity, in a voluntary, active and continuous manner.

6. Enhancement and strengthening of risk management

We will establish a risk management system based on scientific data to enhance and strengthen risk management.

7. Harmonious relationship with society

We will commit ourselves to social contribution activities and work as a good corporate citizen to achieve a harmonious relationship with the rest of the society of which we are part.

8. International business operations

In international business operations, we aim to contribute to sustainable development by protecting the fundamental human rights of people in countries and areas where we operate, and by respecting their cultures and customs.

9. Elimination of antisocial activities

We stand firm against all antisocial forces and groups that threaten social order and safety.

10. Management responsibilities

Management executives will take the lead in implementing this code of conduct and ensure it is thoroughly implemented across the Group. In the event of any non-compliance with the code of conduct, the management executives will investigate the causes, work to prevent reoccurrence, disclose information to the public promptly and accurately, and be held accountable for the event.

Our LOUNGE and SQUARE LAB areas within the head office facilities won the iF Design Award 2022, an award given by iF International Forum Design GmbH.

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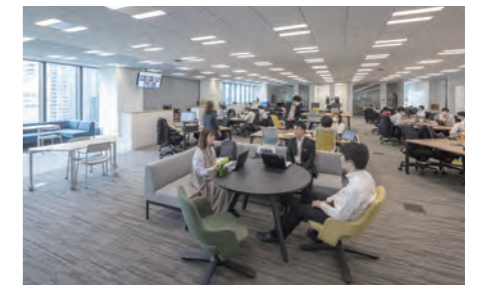
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Sustainability Report 2022

Editorial Policy
 The JX Nippon Mining & Metals Group engages in ESG management in all its business endeavors, toward the sustainable development of society. We issue one edition of the Sustainability Report each year to disclose appropriate corporate information to a broad range of stakeholders, including customers, shareholders and investors, employees, suppliers, and local and international communities. As an important communication tool, this report is designed to enhance stakeholders' understanding of our ESG activities. The Sustainability Report 2022 is structured around the Message From the President, with an awareness of the need to both enhance corporate value and create a sustainable society. This report's presentation is also designed to be easier to understand visually by using illustrations and graphs.

- Referenced Guidelines**
- The Ten Principles and Assurance and Validation Procedure International Council on Mining and Metals (ICMM)
 - GRI Sustainability Reporting Standards (GRI Standards), Global Reporting Initiative (GRI)
 - Environmental Reporting Guidelines 2018, Ministry of the Environment
 - Task Force on Climate-related Financial Disclosures (TCFD)

The indicators in this report that are assured by a third-party organization are marked with a check.

Definitions of Terminology
 JX Nippon Mining & Metals (The Company): The terms "JX Nippon Mining & Metals" and "the Company" refer to JX Nippon Mining & Metals Corporation.
 The JX Nippon Mining & Metals Group (the Group): The terms "the JX Nippon Mining & Metals Group" and "the Group" refer to JX Nippon Mining & Metals Corporation and all its subsidiaries. However, the companies subject to reporting vary among different sections of the report (see "Scope of this Report" for details).
 The ENEOS Group: The term "the ENEOS Group" refers to the corporate group formed by ENEOS Holdings, Inc., the parent company of JX Nippon Mining & Metals Corporation. Along with the Company, the core operating companies of the ENEOS Group are ENEOS Corporation and JX Nippon Oil & Gas Exploration Corporation.

Publication Date
 March 2023
 Publication date of previous report: January 2022
 Publication date of next report: January 2024

Reporting Period
 April 2021 - March 2022
 In principle, this report covers our business activities during fiscal 2021. To ensure comprehensive disclosure, however, it also includes certain information regarding important events that occurred prior to or after this period.

Scope of this Report
 This report covers JX Nippon Mining & Metals Corporation as well as domestic and overseas Group companies. However, in certain parts of the report (listed as "Corresponding Sections" in the table below), we report main indicators only for those companies as described under "Scope of this Report" in the table below. Where the scope of reporting for each indicator differs from the scope shown in the table below, this scope shall be noted separately.

Corresponding Sections	Scope of this Report
Business Overview	Companies included in the consolidated financial statements of JX Nippon Mining & Metals. * The Company and its consolidated subsidiaries listed on the right that have the ◎ symbol after their names.
Environment	Energy and GHGs: Business locations of quantitative importance to the JX Nippon Mining & Metals Group (including business locations with production activities and closed mines) (Companies listed on the right marked with ●) Other environmental data: Production sites of corporations with 21 or more employees (Companies listed on the right marked with *)
Employees, Society, Corporate Governance	The Company and 81 companies in which the Company has 50% or greater voting rights directly or indirectly. * Main companies covered by this report are those marked with ★ to the right.

Main Companies Covered by This Report

Domestic

- JX Nippon Mining & Metals Corporation ◎●★
- JX Metals Trading Co., Ltd. ◎●★
- Toho Titanium Co., Ltd. ◎●★
- JX Nippon Mining Ecomanagement, Inc. ◎●★
- Yoshino Mines Co., Ltd. ◎●★
- Oya Mines Co., Ltd. ◎●★
- Hokuriku Mines Co., Ltd. ◎●★
- Shin-Takatama Mining Co., Ltd. ◎●★
- Kaneuchi Mining Co., Ltd. ◎●★
- Hitachi Mines Co., Ltd. ◎●★
- Shakanai Mines Co., Ltd. ◎●★
- Hanawa Mines Co., Ltd. ◎●★
- Hokushin Mining Co., Ltd. ◎●★
- Namariyama Mining Co., Ltd. ◎●★
- Kamikita Mines Co., Ltd. ◎●★
- Toyoha Mine Co., Ltd. ◎●★
- Shimoda Hot Springs Co., Ltd. ◎●★
- Kamine Clean Service Co., Ltd. ◎●★
- Furuuchi Chemical Corporation ◎●★
- Ibaraki Nikko Kensetsu Co., Ltd. ◎●★
- JX Metals Circular Solutions Co., Ltd. ◎●★
- JX Metals Plant Saganoseki Co., Ltd. ◎●★
- Kasuga Mines Co., Ltd. ◎●★

- JX Nippon Exploration and Development Co., Ltd. ◎●★
- MFN Investment LLC ◎●★
- Nippon Caserones Resources Co., Ltd. ◎●★
- Pan Pacific Copper Co., Ltd. ◎●★
- Keihin Kaseihin Center Co., Ltd. ◎●★
- PPC Logistics Co., Ltd. ◎●★
- JX Metals Smelting Co., Ltd. ◎●★
- JX Metals Smelting Logitech Co., Ltd. ◎●★
- Japan Copper Casting Co., Ltd. ◎●★
- Japan Korea Joint Smelting Co., Ltd. ◎●★
- JX Nippon Environmental Services Co., Ltd. ◎●★
- JX Nippon Tomakomai Chemical Co., Ltd. ◎●★
- JX Nippon Mikkaichi Recycle Co., Ltd. ◎●★
- JX Nippon Tsuruga Recycle Co., Ltd. ◎●★
- JX Nippon Takasho Co., Ltd. ◎●★
- Ichinoseki Foil Manufacturing Co., Ltd. ◎●★
- JX Nippon Coil Center Co., Ltd. ◎●★
- JX Metals Precision Technology Co., Ltd. ◎●★
- Kitabaraki Precision Co., Ltd. ◎●★
- JX Nippon Foundry Co., Ltd. ◎●★
- TANIOBIS Japan Co., Ltd. ◎●★
- Toho Material Co., Ltd. ◎●★
- Advanced Forging Technology, Inc. ◎●★

Overseas

- Hong Kong Nikko Shoji Co., Ltd. ◎●★
- Shenzhen Nikko Shoji Co., Ltd. ◎●★
- Materials Service Complex (Thailand) Co., Ltd. ◎●★
- Materials Service Complex Coil Center (Thailand) Co., Ltd. ◎●★
- Nikko Metals Taiwan Co., Ltd. ◎●★
- JX Nippon Mining & Metals Shanghai Co., Ltd. ◎●★
- MLCC Finance Netherlands B.V. ◎●★
- Nippon Mining of Netherlands B.V. ◎●★
- Nippon LP Resources B.V. ◎●★
- Nippon LP Resources UK Limited ◎●★
- JX Nippon Mining & Metals Chile SpA ◎●★
- Compania Minera Quechua S.A. ◎●★
- JX Nippon Mining & Metals Exploration Peru S.A.C. ◎●★
- JX Nippon Mining & Metals Exploration Chile Limitada ◎●★
- Nippon Caserones Resources Canada Enterprises Corp. ◎●★
- SCM Minera Lumina Copper Chile ◎●★
- Caserones Finance Netherlands B.V. ◎●★
- JX Nippon Mining & Metals Philippines, Inc. ◎●★
- Nippon Mining & Metals (Suzhou) Co., Ltd. ◎●★
- Nikko Fuji Precision (Wuxi) Co., Ltd. ◎●★
- Materials Service Complex Malaysia Sdn. Bhd. ◎●★
- Nikko Metals Shanghai Co., Ltd. ◎●★
- JX Nippon Mining & Metals Dongguan Co., Ltd. ◎●★
- JX Nippon Mining & Metals USA, Inc. ◎●★
- JX Nippon Mining & Metals Europe GmbH ◎●★
- JX Nippon Mining & Metals Korea Co., Ltd. ◎●★
- JX Nippon Mining & Metals Singapore Pte. Ltd. ◎●★
- TANIOBIS GmbH ◎●★
- TANIOBIS Co., Ltd. ◎●★
- TANIOBIS Smelting GmbH & Co. KG ◎●★
- TANIOBIS USA LLC ◎●★
- JX Metals Circular Solutions Europe GmbH ◎●★

* Company names are current as of fiscal 2021.

History of Value Creation

In recognition of our mission as a stable provider of nonferrous metal resources and materials to society, the Group has, since our founding in 1905, strived to generate new value even while answering the various changes in the business environment. We are determined to continue forward, taking on the challenge of contributing to the development of sustainable economies and societies through innovation in resources and materials.

1914 Built the Hitachi Giant Stack

The rapid growth of the Hitachi Mine's business led to severe smoke pollution in its surrounding area. To deal with the pollution, the Company built what was then the world's tallest stack, at 155.7 meters. It began operation in March of the following year.

1978 Built new recycling furnace

A new recycling furnace making use of smelting techniques was built at the Hitachi Smelter & Refinery, marking the launch of the Company's Recycling and Environmental Services Business. Using this furnace, we pursued the business of reclaiming valuable metals from plating sludge and other industrial waste.

1905 Established

1929 Established Nippon Mining

1992 Nikko Metals Becomes Independent Company
Spinoff of Nippon Mining's metals and metal fabrication businesses


2002 Established Nippon Mining Holdings, Inc.
Merger of Japan Energy and Nikko Metals

2016 Changed Japanese name of JX Nippon Mining & Metals

2017 JXTG Holdings (now ENEOS Holdings) Born
JXTG Holdings was established with the merger of JX Holdings and Tonen General Sekiyu K.K.

2010 Birth of the JX Group
The JX Group (JX Holdings) was born as one of the world's leading integrated energy, resources, and materials business groups, conducting business in each of the areas of petroleum refining and sales, oil field development, and metals

June 2020 Relocated Headquarters to the Toranomon area



The Okura Prestige Tower


2022

Net Sales
1,293.0 bil. yen
(fiscal year ended March 2022)
*Consolidated

No. Of Employees
10,113
(as of March 31, 2021)
*Consolidated

1905 Opened the Hitachi Mine


Company founder Kuhara Fusanosuke opened the Hitachi Mine, launching the resources development and smelting and refining businesses. From the very beginning of its operation, Mr. Kuhara actively promoted mechanization and modernization to improve productivity. The Hitachi Mine pioneered the custom smelter, using its full-fledged facilities to process not only ores from its home mine, but also those purchased from other firms.



Founder Kuhara Fusanosuke

1916 Launched operations at the Saganoseki Smelter & Refinery


In order to further expand the mining, smelting, and refining segments fundamental to the Company's diversified business, the Saganoseki Smelter & Refinery was built in Oita Prefecture. It was one of the largest such plants in Japan. Even to this day, it remains a key location within the JX Nippon Mining & Metals Group, as a leading-edge smelter boasting worldclass technological capabilities and production capacity.



The Saganoseki Smelter & Refinery in 1916

1964 Launched operations at Kurami Works


The launch of operations at the Kanagawa-based Kurami Works marked the Company's earnest entry into the metal fabrication business. It featured the latest rolling mills, producing phosphor bronze and other copper alloy products. By answering the needs of complex markets for diverse, small-lot, and made-to order products, as well as advanced technical demands on products, the Company carved out a solid position for itself in the metal fabrication field.



Kurami Works just after completion

1985 Launched operations at Isohara Works

The Company entered the electronic materials business in time for the rise of the electronics industry in the 1980s, making sputtering targets for semiconductors and transparent conductive films for liquid crystal displays, as well as materials for compound semiconductors. By establishing the Ibaraki-based Isohara Works as a new main manufacturing center, the Company expanded into development and manufacturing of copper foil and various electronics materials.




The newly-established Isohara Works

2014 Launched production at Caserones Copper Mine

The Group celebrated the official opening of the Caserones Copper Mine, a resource development project in the Republic of Chile fully funded by Japanese entities providing the Group's first copper concentrate shipments.


February 2021
Acquired all equity in the Caserones Copper Mine through the purchase of equity held by Mitsui Mining & Smelting Co., Ltd. and Mitsui & Co., Ltd.



Caserones Copper Mine

2018 Acquired shares in H.C. Starck Tantalum and Niobium GmbH (now TANIOBIS GmbH)

The Group acquired shares of H.C. Starck Tantalum and Niobium GmbH (now TANIOBIS GmbH), a German manufacturer of metal powders, with an eye to expanding its business areas in anticipation of dramatic demand growth for electronic components and devices.



TANIOBIS GmbH (Goslar Plant)



JX Nippon Mining & Metals Corporation
President and Chief Executive Officer

Murayama Seiichi

Message From the President

We Will Communicate our Vision of Becoming a Technology-Based Company to our Stakeholders More Clearly, Creating Sustainable Societies Together

[Review of Fiscal 2021]

Significant increase in profit year on year: Focus Businesses were strong in response to higher demand in IT; Base Businesses benefited from high resource prices and weak yen

The JX Nippon Mining & Metals Group posted a significant increase in consolidated operating profit, reaching 158.2 billion yen in fiscal 2021. This figure was almost double the 78.1 billion yen earned in the previous fiscal year. A more detailed look shows the significant impact of high prices for non-ferrous metals and the weak yen. Even excluding the tailwinds of the external environment, we see that performance outpaced prior-year levels. In particular, the Functional Materials Business, Thin Film Materials Business, and Tantalum and Niobium Business—three Group Focus Businesses—recorded a sharp increase in profits. This remains true, even when excluding external environmental factors. One could say this is the result of concerted Group efforts to increase production and sales of products that play to our strengths. This, amid continued market growth in highly functional IT fields such as smartphones and telecommunications infrastructure.

At the same time, Base Business also posted an increase in profits, as they benefited from rising market prices and a weaker yen. Let's look at our Mineral Resources Business. The Caserones Copper Mine, in which we acquired a 100% interest in February 2021, and the Escondida and Los Pelambres Mines (both in Chile), where we hold equity interests, were forced to operate under the COVID-19 pandemic. As a result, we were unable to secure sufficient staffing at these locations and failed to achieve full production throughout the year. While these were unavoidable developments, other issues remain unresolved as well. Our Metals & Recycling Business has been working to increase processing of recycled materials, optimize the composition of raw materials, and improve the operational efficiencies at manufacturing sites, operating under an integrated smelting and recycling system. And though we faced a number of unfavorable conditions, including COVID-19 and intensifying competition for recycled raw materials overseas, we have been seeing success in a series of initiatives.

[Growth Investment Targets]

Rapid facilities expansion in response to the quickly growing advanced materials market and large-scale investments for the future

We announced several plans for large-scale capital investments in fiscal 2021 through early fiscal 2022. The JX Nippon Mining & Metals Group redefined our business based on the ideal of our Long-Term Vision 2040. And we declared our transformation

into a technology-based company. A technology-based company is a company that maintains a resilient portfolio of Base Businesses in society at all times, while contributing to the SDGs and sustainable societies through high-value-added and differentiated advanced materials. Market growth in these fields had already become clear in fiscal 2021. Our intention to expand facilities to seize these opportunities is a major topic in our current medium-term management plan.

In December 2021, we announced plans to increase production capacity for sputtering targets for semiconductors and treated rolled copper foil. The former and latter are slated for new plants in the northern part of Hitachi City and Hitachi Works, respectively. As we expand manufacturing capacity for both products, we also decided to make further investments to respond flexibly to the rapid growth in demand. We view these capital investments as a response to market growth during the next medium-term management plan, which begins in fiscal 2023. Here, we plan to invest approximately 30 billion yen. Looking ahead to the next medium-term management plan, we have decided to invest in the TANIJOBIS Thailand plant run under the Tantalum and Niobium Business. We intend to increase production capacity of functional tantalum powder by about 30%. In addition, we made Tokyo Denkai Co., Ltd. a wholly owned subsidiary to strengthen the supply chain running from the Tantalum and Niobium Business to the Thin Film Materials Business. Tokyo Denkai is responsible for tantalum ingot manufacturing.

In March 2022, we announced the acquisition of a large site for the construction of a new plant in Hitachinaka City, Ibaraki Prefecture. The new plant will be a new major center for advanced materials with a view beyond the next medium-term management plan. We expect demand growth in the semiconductor and electronic device fields to continue over the long term. Therefore, we are looking to build an integrated plant, and relocate certain of our head office functions to Ibaraki Prefecture. While we are studying details of the total investment in the new plant, we expect this to be our largest-ever investment in a production facility.

We also acquired a large site in the U.S. state of Arizona. Arizona is a hub to the semiconductor industry, and we intend to expand production capacity for sputtering targets for semiconductors in a flexible manner in response to customer needs. Not only that, but we also intend to leverage this large, 260,000 square meter site to be our center for advanced materials in North America.

We understand the need to strengthen the competitive stance of the Base Business to fortify our foundation as an operation that supports Group growth. To evolve our Green Hybrid Smelting technology, we recently made several investments to strengthen our Metals & Recycling Division. These investments focused on the Saganoseki Smelter & Refinery

Reference → [Building a New Plant in Hitachinaka City ⇒P72](#)

owned by JX Metals Smelting Co., Ltd. As one example, we built a new logistics center in Oita City, upgrading the processing facilities for recycled materials at the smelter. In August 2022, we announced the acquisition of eCycle Solutions Inc. to bolster the collection of recycled materials. eCycle Solutions is an e-waste (discarded household appliances and electronic devices) collection and processing company with a strong collection network and the largest market share in Ontario, Canada. The company operates eight locations, including its main site in the province of Ontario. At the same time, we pursued selection and concentration to strengthen our businesses. To this end, we decided to sell our shares in P.T. Smelting (Indonesia) and LS-Nikko Copper (Korean smelting company). Meanwhile, as a measure to strengthen our supply chain, we acquired shares in Hokuho Unyu Corporation to reinforce our sulfuric acid transportation infrastructure.

[Progress in ESG Management]

A Partnership among industry, academia, and government for a Sustainable Copper Vision and LiB Closed Loop Recycling

The JX Nippon Mining & Metals Group designated ESG as a materiality, and we have pledged to contribute to sustainable societies. Looking back over the past year, we have seen an acceleration in global trends toward the SDGs and ESG, including the decarbonization movement. Most of the strategic investments and measures we undertook in fiscal 2021 are also important from an ESG perspective.

Demand for copper and other non-ferrous metals will continue to increase. But we must also contribute to society by transforming ourselves into an entity offering higher-value-added advanced materials on proprietary technologies. The movement toward decarbonization is expanding with the spread of electric vehicles (EVs), as well as electrification and renewable energy more generally. Our businesses supply the non-ferrous metals and advanced materials indispensable for the technological innovations that will make these changes possible. And we are confident that these businesses contribute to the SDGs and ESG as we continue to grow. We also know we must consider raw materials procurement and production process related to nonferrous metals and advanced materials from an SDGs and ESG perspective.

Our Sustainable Copper Vision, published in August 2022, expresses the Group's beliefs in this area. Copper is a nonferrous metal that contributes to sustainable societies. Demand for this metal will only continue to grow. And we have defined it as a Group mission to ensure the stable supply of copper into the future, producing copper in a manner that considers ESG issues such as decarbonization and enabling a circular economy. Spe-

cifically, we will evolve sustainable production and supply practices through Green Hybrid Smelting, which uses a greater ratio of recycled raw materials in copper smelting than ever before. And we will communicate to the world that copper produced in this way is the optimal solution for resource savings, energy conservation and carbon savings. We hope to form a Green Enabling Partnership with companies and organizations that support our ideas, expanding the circle of support.

In terms of resource recycling and the circular economy, we are working on the development of closed-loop technology for lithium-ion batteries (LiB). After installing test equipment at the Hitachi Works Technology Development Center, we established JX Metals Circular Solutions in spring 2021 to develop mass production technology. Overseas, particularly in Europe, the demand for resource recycling is even stronger than in Japan. There, battery recycling general, including LiB recycling, became mandatory at the end of 2020. JX Metals Circular Solutions Europe GmbH and TANIJOBIS GmbH (both Germany), together with our entire Group, are making concerted efforts in this area to build a competitive business model that complies with European regulations, which are leading the way in this field. As part of this effort, we decided to join HVBatCycle in June 2022. HVBatCycle is a new industry, government, and academic consortium formed around the Volkswagen Group. This group is engaged in joint research and development on the recovery and reuse of automotive-use LiB materials. Given the rapid spread of EVs worldwide, LiBs are expected to be disposed of in mass quantities in the year 2030 or so. Widespread use of EVs will also lead to a significant increase in demand for nickel, cobalt, and lithium, which are necessary for automotive batteries. Finding these resources solely from natural resources such as mines will be impossible. It is becoming a common understanding among our partners that closed-loop recycling of battery materials from EV to EV is one of the best solutions both socially and economically. We believe that our Group technology can play a role as part of a mechanism that contributes to the sustainable supply of these scarce resources.

[Materiality]

Communicating widely our mission to contribute to society as a technology-based company, co-creating the future together with our stakeholders

In fiscal 2020, we have again identified materialities to prioritize as a group in light of the demands of society and changes in the industry. We have already discussed the materiality of providing advanced materials that support lives and lifestyles. In contributing to global environmental conservation, we declared we will advance our interim CO₂ emissions reduction

target by 10 years, based on our belief that we should more proactively reduce our own CO₂ emissions as part of our climate change strategy. This target is in addition to the aforementioned Sustainable Copper Vision and LiB Closed Loop initiative. Today, we pursue group-wide activities toward a major goal to reduce total in-house CO₂ emissions by 50% in fiscal 2030 versus fiscal 2018, achieve reach net zero by fiscal 2050. Our current medium-term management plan defines an ESG investment quota to encourage capital investment and technological development. We are pursuing the transition to CO₂-free electricity at domestic and overseas business sites. In July 2022, we became the first company in the non-ferrous metals industry to establish a transition-linked loan framework (TLLF). We structured transition financing based on the use of the TLLF to cover the environmental costs of our sputtering target for semiconductor production site at the New Hitachi-kita Factory (tentative name). We are also working to quantify the Scope 3 equivalent of CO₂ emissions, and to further enhance information disclosure based on the TCFD, which synthesizes this information.

To achieve our long-term vision, we must transform ourselves into a corporate entity that generates new business continuously. Recognizing that creative, human resources capable of creating added value are indispensable for this, we strive to create attractive workplaces. In June 2020, we relocated our head office and adopted activity-based working (ABW), which has become a new work style for the group. Our main objective is to create a communication environment conducive to value-added creation, while respecting the diverse work styles and values of each individual. Telework has quickly become a favored work style, partly due to the spread of the COVID-19. But at the same time, I feel that emphasizing face-to-face communication is also essential for revitalizing an organization and creating innovation.

When I have the opportunity to meet with employees, I always talk about the importance of work-oriented communication, which is part of our groups DNA. I also talk about the significance of engaging in discussions with a wide variety of people as we tackle tasks and issues. We believe that technology-based companies must have a keen grasp of social change and demonstrate creativity. Companies that lack such capabilities will be weeded out eventually. Creativity cannot be born from a mindset that is content with the status quo. I believe we have a unique approach in that we engage actively in open innovation, seek and absorb diverse knowledge, and carry out in lively discussions to revitalize our internal organization.

We are fortunate to deal in materials for which society's needs will continue to grow in the future. But there is no guarantee that we will continue to grow in 10, 20, or 30 years at our current rate. Markets are changing faster and market requirements are becoming more sophisticated. One moment to the next may demand different characteristics, more advanced



performance, and higher quality. If we cannot respond through technology, our business will be in a serious predicament. We are accelerating our digital transformation (DX) strategy to establish a business foundation that offers a distinct advantage over other non-ferrous metals companies in the world, and we strive to become this type of technology-based company.

Increasing coexistence and coprosperity With Local Communities is a materiality and an important management issue for us. We will succeed by raising awareness of our businesses and initiatives not only among our employees, but also among society as a whole. We are always ready to work on co-creation with communities, universities, schools, and organizations that share the same destination and concept as our company. We welcome partnerships with companies ranging from start-ups to large corporations. Sticking to our own principles may not be the best course to reaching our long-term vision for the year 2040. We will work together with people in all fields achieve our ideal for society. To this end, we communicate actively to paint a clear picture of JX Nippon Mining & Metals Group vision. Our announcement of the Sustainable Copper Vision is a symbol of this commitment and a statement of our intention to accelerate our efforts. We will continue to foster circular economies through collaboration and cooperation (Green Enabling Partnership) with various partners across industries.

Reference → Special Feature 1 Sustainable Copper Vision ⇒P23

Reference → Materialities (Priority Issues) and KPIs (Key Performance Indicators) ⇒P35

Reference → Special Feature 2: The JX Nippon Mining & Metals Group Climate Change Strategy ⇒P37

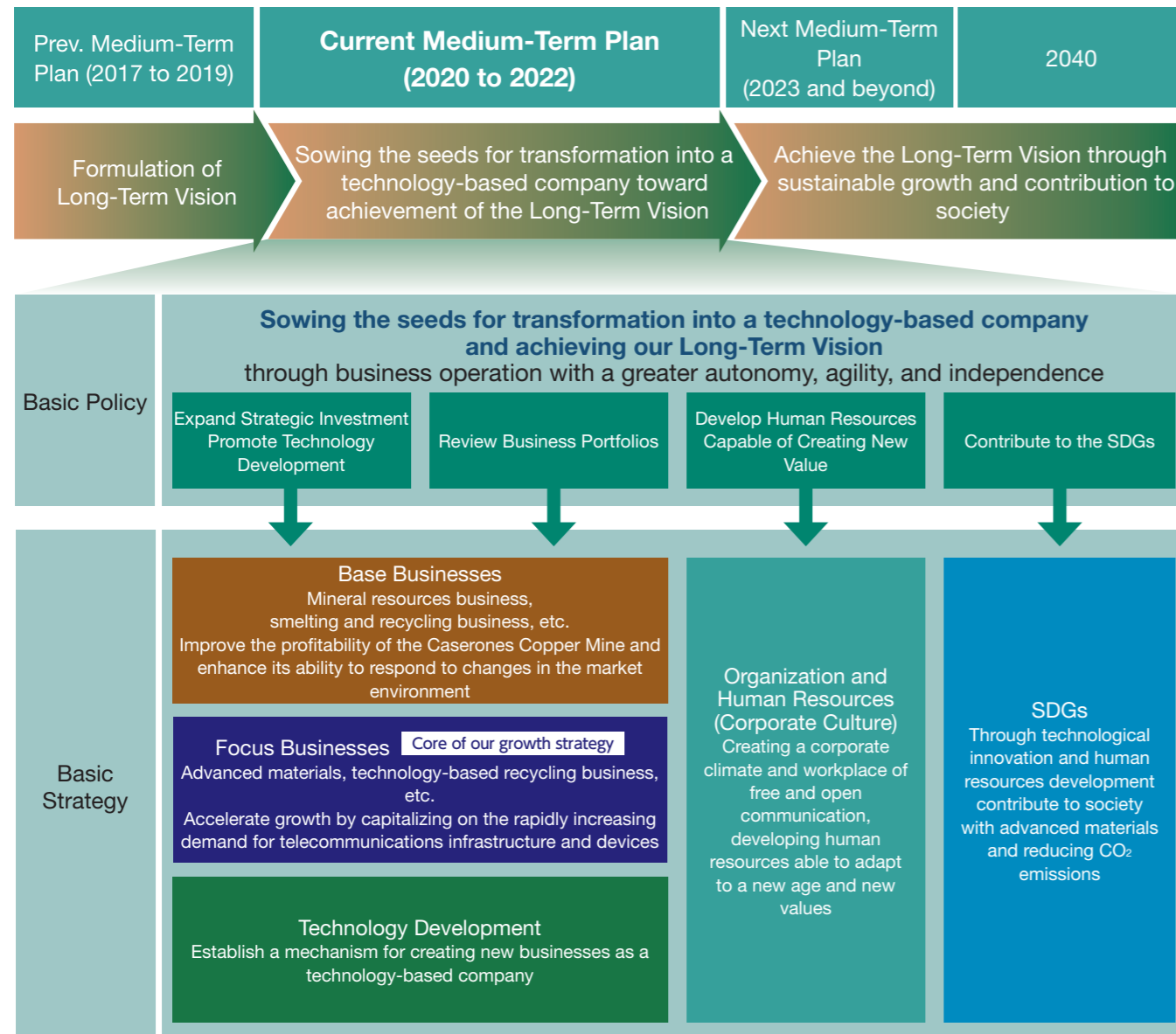
Reference → Special Feature 3: Accelerating Our Digital Transformation (DX) Strategy ⇒P55

Medium-Term Management Plan for Fiscal 2020 to 2022

Beginning in fiscal 2020, the medium-term management plan is positioned as a three-year period for sowing seeds in anticipation of transforming into a technology-based company as set forth in the JX Nippon Mining & Metals Group Long-Term Vision 2040 formulated in May 2019. We are accelerating our efforts in new growth areas. We are promoting initiatives, human resource development, and the creation of an organizational culture suited to the characteristics of each business. We are implementing corporate management that further enhances autonomy, agility, and independence.

The JX Nippon Mining & Metals Group Long-Term Vision 2040
 By pivoting from being an equipment industry company to a technology-based company, we will realize a highly profitable structure even in the face of intensifying international competition and contribute to the realization of a sustainable society as targeted by the SDGs

Role of the Current Medium-Term Plan



Summary of Business Results for Fiscal 2021

Copper and other nonferrous metals are indispensable for the wider adoption of renewable energy and electric vehicles (EVs). Demand is growing as the world works toward achieving decarbonized, circular economies. The JX Nippon Mining & Metals Group engages in a number of measures in response to this trend.

Although production volume declined in the Mineral Resources Business due to a strike at the Caserones Copper Mine, profit increased, mainly due to higher copper prices. The Metals & Recycling Business posted higher profit due to rising prices

for precious metals and an improvement in the international market for sulfuric acid, even as conditions deteriorated with respect to purchasing raw copper concentrates.

Sales volume for each product in the Functional Materials and Thin Film Materials Businesses generally exceeded previous fiscal year due to strong demand in the high-functional IT field.

The JX Nippon Mining & Metals Group operating profit for the period under review increased 102.6% from the previous year to 158.2 billion yen, mainly due to higher metal prices and increased sales of electronic materials.

Financial Performance (Consolidated, IFRS)



Changes in Social Trends

With significant changes in social trends, the Group formulated a Long-Term Vision out of a sense of crisis about continuing with our conventional business model. We are now aiming at transforming ourselves into a technology-based company. Fiscal 2021 saw changes in the industry structure due to the impact of the spread of COVID-19, growing momentum toward the SDGs and ESG management, and accelerated movement toward social demands for carbon neutrality. In response, the JX

Nippon Mining & Metals Group reaffirmed our recognition in August 2022 that Copper is an essential material for achieving carbon neutrality. We developed the Sustainable Copper Vision as a policy for the supply and ongoing evolution of sustainable copper. Given that the environment surrounding the Group will continue to change throughout fiscal 2022 and beyond, by clearly understanding these social changes, we aim to fundamentally change our organizational culture.

Environmental Awareness

Creating the Long-Term Vision

Expanding Needs for Advanced Materials	In addition to IT and mobility, digital data is being used in a variety of industries, including healthcare, energy, and construction. The need for advanced materials used in these fields will further expand
Shrinking Domestic Market/ Focus on Emerging Economies for Sustainable Growth are Issues	The domestic market is shrinking due to the declining birthrate, aging population, and the industry hollowing out. The focus of economic growth is shifting to emerging economies in Asia and other regions, but the challenge is to deal with the environmental problems that are beginning to emerge even in emerging economies
Increasing Scarcity and Depletion of Resources due to the Expansion of the Middle Class	As the middle class increases, the amount of resources consumed also increases. Acquiring good quality and inexpensive resources will be subject to competition. Resource shortages and depletion, as well as uneven regional distribution, will become more serious

At Present

Expanding Demand for Advanced Materials	<ul style="list-style-type: none"> The spread of COVID-19 has accelerated the development of a data-driven society, and demand for smart devices and telecommunications infrastructure has increased To solve the shortage of semiconductors, demand for materials is rapidly increasing
Global Acceleration in Addressing Climate Change	<ul style="list-style-type: none"> As environmental problems become more apparent around the world, global companies are accelerating their response to climate change, especially concrete actions for decarbonization
Deepening Mineral Resource Shortages/ Depletion	<ul style="list-style-type: none"> With the increase in mineral resources consumed, competition for high-quality, inexpensive mineral resources is intensifying Focus on nonferrous metals to support future infrastructure and growing concerns about depletion Competition to collect recycled raw materials and scrap will intensify, as prices of nonferrous metals remain high and the world transitions to circular societies

Targets and Progress of the Medium-Term Management Plan for Fiscal 2020 - 2022

When we formulated the current medium-term management plan, we set the operating income target at 170 billion yen for the three-year cumulative period. However, against the backdrop of the aforementioned business environment, we expect to increase profits in both Base and Focus Businesses. We increased our Base Business target by 192.0 billion yen over our original medium-term management plan, despite the impact of COVID-19. This revision mainly reflects higher prices for copper,

precious metals, and sulfuric acid. In the Focus Business, we have raised our target 43.0 billion yen over the original 100.0 billion yen target in our plan. This revision reflects increasing sales stemming from strong demand growth. Based on this outlook, we will continue to make company-wide efforts to establish earnings and a financial base. In addition, we will promote the use of ESG-related indicators as important management indicators.

Operating Profit

(Unit: billions of yen)

		Results for Fiscal 2020	Results for Fiscal 2021	Outlook for Fiscal 2022	2020-2022 Three-Year Cumulative Total
Base Businesses	Mineral Resources Business	34.9	72.1	80.0	287.3
	Metals & Recycling Business	27.3	41.0	32.0	
Focus Businesses	Functional Materials Business, Thin Film Materials Business, Other	31.1	54.5	57.0	142.6
Common Business Expenses		(15.2)	(9.4)	(39.0)	(63.6)
Total		78.1	158.2	130.0	366.3

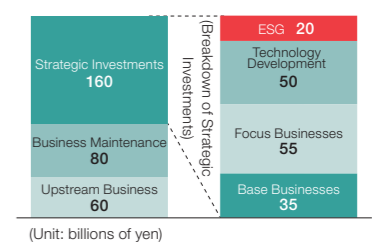
*The outlook for Fiscal 2022 and the three-year cumulative outlook are current as of May 2022.

Strategic Investment

In the medium-term plan for fiscal 2020 - 2022, we will invest 300 billion yen over the three years in the development of advanced materials. Of this amount, 160 billion yen will be allocated to strategic investments for future growth, including capacity expansion, development of new materials, and exploration of minor metal mining interests. In addition, we will redefine our

ESG investment quota of 20 billion yen to stimulate ESG activities, such as decarbonization and resource recycling.

Cumulative Total of Investment Plan for Three years: 300 billion yen



Our Group Initiatives

Base Businesses		<ul style="list-style-type: none"> Improve operations at the Caserones Copper Mine, continue to reduce costs at all stages of the process, and strengthen maintenance systems Implementing plans for increased collection and processing of recycled raw materials; acquired a major recycler in Canada. Accelerate technological development to increase the percentage of recycled raw materials (input ratio of raw materials or content ratio in products) to 50% or more by 2040 to achieve our Green Hybrid Smelting plan by 2050
Focus Businesses		<ul style="list-style-type: none"> Increase production capacity and construct a new plant to meet growing demand. In anticipation of the next medium-term business plan and beyond, we have decided to construct a new plant in Hitachinaka City, Ibaraki Prefecture; we will also acquire a large site in the United States Create a more resilient supply chain by increasing production capacity flexibly in parallel with business continuity measures such as strengthening overseas locations in preparation for disasters and geopolitical risks, securing raw materials in cooperation with other companies, including making a tantalum and niobium smelting and processing manufacturer a wholly owned subsidiary, etc.
Technology Development		<ul style="list-style-type: none"> Nurture and quickly commercialize businesses that will become pillars of the next generation (next-generation semiconductor materials, metal powder for 3D printers, crystalline materials, battery materials, LiB recycling (closed loop)) Promote industry-academia collaboration (FY2021 onward; new Materials and Technology Collaborative Research Laboratory in cooperation with The National Institute of Advanced Industrial Science and Technology, Endowed Research Unit for Nonferrous Metal Resource Recovery Engineering (JX Metals Endowed Unit, the University of Tokyo) [Phase 3], etc.) JX Nippon Research Institute for Technology & Strategy Co., Ltd. aims to become a think tank in the field of nonferrous metals with a diverse pool of high-level human resources
ESG Management		<ul style="list-style-type: none"> Promote initiatives to achieve long-term environmental targets (50% reduction of Group CO₂ emissions by fiscal 2030 compared to fiscal 2018, and net zero CO₂ emissions by fiscal 2050) as a response to climate change Develop the Sustainable Copper Vision and fulfill the dual missions of establishing stable supply systems and conducting ESG-oriented production/supply of copper, indispensable for achieving carbon neutrality, through Green Hybrid Smelting Establish technologies and business models for closed-loop recycling of automotive LiBs with partners in Japan and overseas
Organization and Human Resources		<ul style="list-style-type: none"> Develop human resources across four perspectives: (1) digital and DX human resources; (2) value-added human resources; (3) ESG human resources; and (4) global human resources

Global Network (as of September 30, 2022)

JX Nippon Mining & Metals has many production sites and Group companies in Japan and overseas. By utilizing this Group network, we are able to meet the increasingly sophisticated and diverse needs of our customers and society, and provide them with new value.

Europe

- Frankfurt Office
- JX Nippon Mining & Metals Europe GmbH
- JX Metals Circular Solutions Europe GmbH
- TANIOBIS GmbH
- TANIOBIS Smelting GmbH & Co. KG
- Nippon LP Resources UK Ltd.

Middle East

- Advanced Metal Industries Cluster and Toho Titanium Metal Company Limited

Asia

- JX Nippon Mining & Metals Korea Co., Ltd.
- Poongsan-Nikko Tin Plating Corporation
- JX Nippon Mining & Metals Shanghai Co., Ltd.
- Nikko Metals Shanghai Co., Ltd.
- Nippon Mining & Metals (Suzhou) Co., Ltd.
- Nikko Fuji Precision (Wuxi) Co., Ltd.
- JX Nippon Mining & Metals Dongguan Co., Ltd.
- Hong Kong Nikko Shoji Co., Ltd.
- Shenzhen Nikko Shoji Co., Ltd.
- Nikko Metals Taiwan Co., Ltd.
- JX Nippon Mining & Metals Philippines, Inc.
- TANIOBIS Co., Ltd.
- Materials Service Complex Malaysia Sdn. Bhd.
- JX Nippon Mining & Metals Singapore Pte. Ltd.

North America

- eCycle Solutions Inc.
- JX Nippon Mining & Metals USA, Inc.
- TANIOBIS USA LLC

Central and South America

- JX Nippon Mining & Metals Exploration Peru S.A.C.
- Compania Minera Quechua S.A.
- Escondida Copper Mine
- Caserones Copper Mine
- Los Pelambres Copper Mine
- Chile Office
- JX Nippon Mining & Metals Chile SpA
- JX Nippon Mining & Metals Exploration Chile Limitada
- SCM Minera Lumina Copper Chile

Japan

- JX Nippon Tomakomai Chemical Co., Ltd.
- Esashi Works, JX Metals Precision Technology Co., Ltd.
- Ichinoseki Foil Manufacturing Co., Ltd.
- Shirakawa Plant, JX Nippon Takasho Co., Ltd.
- Isohara Works
- JX Nippon Foundry Co., Ltd.
- Hitachi Works
- Hitachi Works, JX Metals Smelting Co., Ltd.
- JX Nippon Environmental Services Co., Ltd.
- Kamine Clean Service Co., Ltd.
- Hitachi Plant, Toho Titanium Co., Ltd.
- Mito Plant, TANIOBIS Japan Co., Ltd.
- Tsukuba Factory, Furuuchi Chemical Corporation
- Tatebayashi Works, JX Metals Precision Technology Co., Ltd.
- Nasu Works, JX Metals Precision Technology Co., Ltd.
- JX Nippon Exploration and Development Co., Ltd.
- Tokyo Denkai Co., Ltd.
- Kurami Works
- Kurami Office, JX Nippon Coil Center Co., Ltd.
- Kawasaki Office, JX Nippon Coil Center Co., Ltd.
- Chigasaki Plant, Toho Titanium Co., Ltd.
- JX Nippon Mikkaichi Recycle Co., Ltd.
- Kurobe Plant, Toho Titanium Co., Ltd.
- Kakegawa Works, JX Metals Precision Technology Co., Ltd.
- JX Metals Circular Solutions Co., Ltd.
- Takatsuki Plant, JX Metals Trading Co., Ltd.
- Yahata Plant, Toho Titanium Co., Ltd.
- Wakamatsu Plant, Toho Titanium Co., Ltd.
- Saganoseki Smelter & Refinery, JX Metals Smelting Co., Ltd.
- Saganoseki Works, Japan Copper Casting Co., Ltd.
- JX Metals Smelting Logitech Co., Ltd.
- Kasuga Mines Co., Ltd.

Corporate Profile

Company Name	JX Nippon Mining & Metals Corporation
Paid-in Capital	75.0 billion yen (wholly owned by ENEOS Holdings, Inc.)
Representative	Murayama Seiichi, President and Representative Director
Revenue	1,293.0 billion yen (fiscal 2021, consolidated)
Head Office	10-4, Toranomon 2-chome, Minato-ku, Tokyo 105-8417, Japan The Okura Prestige Tower
Business Lines	<ul style="list-style-type: none"> ●Mineral Resources Business ●Metals & Recycling Business ●Functional Materials Business ●Thin Film Materials Business ●Tantalum and Niobium Business ●Titanium Business

Employees	3,275 (as of March 31, 2022)
Employees	10,113 (as of March 31, 2022)
Domestic Operating Sites	<ul style="list-style-type: none"> ●Hitachi Works (Ibaraki Prefecture) ●Isohara Works (Ibaraki Prefecture) ●Kurami Works (Kanagawa Prefecture) ●Technology Development Center (Ibaraki Prefecture)
Overseas Operating Sites*	<ul style="list-style-type: none"> ●Chile Office ●Frankfurt Office

* The JX Nippon Mining & Metals Group conducts business in 13 countries and regions outside Japan.

Responding to International Norms and Initiatives

The Group recognizes compliance with international norms and initiatives as one of the most important issues across the entire company. We will contribute to achieving a sustainable society by complying with social demands such as recent international norms and initiatives. To this end, we are actively participating in initiatives. We also participate actively in nonferrous metals and other various industry associations, incorporating the knowledge gained through opinion exchanges and information sharing in our business activities.

Communication with Industrial Associations

Name of Association	The Role of JX Nippon Mining & Metals in FY2021	Activity Content
Japan Mining Industry Association (JMIA)	Chairman	The JMIA is an association of companies engaged in the smelting business and nonferrous metal resource development. JMIA promotes the sound growth of the industry by conducting research and publicizing knowledge for technical improvement and making policy proposals to concerned government ministries and agencies. The JX Nippon Mining & Metals Group served as chair of the association in FY2021.
The Sulphuric Acid Association of Japan	Managing Director	This association aims for the sound development of the sulfuric acid industry in Japan. JX Nippon Mining & Metals is involved in the administration of the association as well as in the survey and reporting of supply and demand as a member of the Operations Committee and General Affairs Committee.
Japan Copper and Brass Association (JCBA)	Vice-Chairman	The JCBA works with member companies to promote progress and growth throughout the entire copper production industry. The Group sits on the Roadmap Committee to take part in the improvement of quality and the discovery of new demand. The Group is also involved in the survey and reporting of market size as a member of the Statistics Committee.
Japan Society of Newer Metals (JSNM)	Vice Chairman	The JSNM was established to promote the sound growth of new metals that support high-tech and related industries through research and the collection and provision of information. JX Nippon Mining & Metals sits on the Compound Semiconductors Subcommittee and the Target Subcommittee in order to be involved in the survey and reporting of market size as well as to take part in providing opinions and advice to concerned government ministries and agencies. JX Nippon Mining & Metals also sits on the Safety Committee to contribute to the improvement of health and safety throughout the industry.
Japan Catalyst Recovering Association (JCRA)	Chairman	Comprising companies engaged in the reuse of catalysts, JCRA was established to promote the recycling of precious and minor metals through appropriate processing of used catalysts. It holds periodical training for technical improvement and mutual communication among members while engaging in the investigation and collection of statistics relating to recycling. We provide the chairman of the association and is also involved in the publication of survey reports as well as management of general meetings as a member of the PR Committee.

Related Initiatives

United Nations Global Compact



The United Nations Global Compact is a global framework for companies and organizations to act as good members of society and achieve sustainable growth. We have been participating in the program since August 2008, supporting the 10 principles in four areas and are striving to achieve them.

WEB → UN Website
<https://www.unglobalcompact.org/>

Extractive Industries Transparency Initiative (EITI)



The EITI is the multilateral cooperation standard for the promotion of open and accountable management of extractive resources with the goal of reducing poverty and achieving sustainable development in resource-producing countries. Being engaged in resource development at the global level, JX Nippon Mining & Metals agrees to the goals of the EITI and supports its activities.

WEB → EITI Website
<https://eiti.org/>

Carbon Disclosure Project (CDP)



The CDP is an international NGO based in London. It is an organization that collects, analyzes, and evaluates information on the environmental activities of the world's major corporations and discloses these results to institutional investors. Our company engages in the disclosure of information on climate change and water safety, which the CDP has identified as priority issues. We also disclose information through questionnaires to our business partners.

WEB → CDP Japan Website
<https://www.cdp.net/en>

International Council on Mining and Metals (ICMM)



The ICMM is an international organization established to promote the sustainable growth of society through the nonferrous metal industry business. As a member of the ICMM, JX Nippon Mining & Metals established the Code of Conduct in accordance with the ICMM Mining Principles and are working to resolve various issues raised in the Position Statements.

WEB → ICMM Website
<https://www.icmm.com/>

Task Force on Climate-related Financial Disclosures (TCFD)



The TCFD is an organization established by the Financial Stability Board (FSB) that recommends companies disclose climate change-related risks and opportunities. In May 2019, ENEOS Holdings endorsed and signed the recommendations set out by the TCFD. In response, the Group is moving to disclose information in line with the aims of these recommendations.

WEB → TCFD Website
<https://www.fsb-tcfd.org/>

Challenge Zero



Challenge Zero is an initiative established by Keidanren, in partnership with the Japanese government, to encourage companies and organizations to innovate toward creating decarbonized societies. The JX Nippon Mining & Metals Group announced our participation in June 2020.

WEB → Challenge Zero Website
<https://www.challenge-zero.jp/en/>

Section 1 Vision and Value

Responding to International Norms and Initiatives

GX League



The GX League, led by the Ministry of Economy, Trade and Industry (METI), is a framework for industry, government, and academia to collaborate in the challenge of Green Transformation (GX) with a view to achieving carbon neutrality by 2050 and reforming Japan's entire economic and social system. We participate in GX activities, and we expressed our support for the GX League Basic Concept.

WEB GX League Website

<https://gx-league.go.jp/>



WIPO Green



WIPO GREEN is a framework for technology exchange launched by the World Intellectual Property Organization, a specialized agency of the United Nations. The aim of this organization is to spread the adoption of environmental technologies and promote innovation. Entities participate by registering environmental technology in the organization's database. WIPO then matches technology with individuals and organizations. We have registered intellectual property related to our proprietary copper-recovery technology, the JX-Iodine Process, in the database.

WEB WIPO GREEN Website

<https://www3.wipo.int/wipogreen/en/>



Copper Mark

Established in 2019 by the International Copper Association (ICA), the Copper Mark is a framework to demonstrate the copper industry's responsible production and contributions to the SDGs of the United Nations. In March 2022, we began the process of acquiring Copper Mark certification for the Saganoseki Smelter & Refinery and the Hitachi Works operated by JX Metals Smelting Co., Ltd.

WEB Copper Mark Website

<https://coppermark.org/>



Partnership Development Declaration



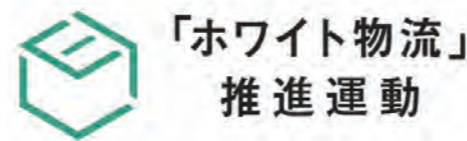
The Partnership Development Declaration is an initiative that aims to increase added value throughout the supply chain by having corporate leaders declare supply chain-wide coexistence and coprosperity, that new partnerships will transcend size, affiliation, etc., and that participants will engage in desirable business practices with subcontractors. We announced our participation and declaration in April 2022.

WEB Partnership Development Declaration Portal Site

<https://www.biz-partnership.jp/>



White Logistics Movement



The *White Logistics* Movement is a movement promoted by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) drives a movement to encourage an understanding among companies and the public regarding sustainable logistics. We announced our participation in April 2020, and our Logistics Department leads company-wide efforts in this area.

WEB White Logistics Campaign Portal Site

<https://white-logistics-movement.jp/>



Responsible Business Alliance (RBA)

The RBA is an industry association consisting mainly of electronics manufacturers and suppliers of electronic components. Many of our customers are members of the RBA. The JX Nippon Mining & Metals Group pursues stronger ESG initiatives by conducting activities in accordance with the code of conduct established by the RBA.

WEB RBA Website

<https://www.responsiblebusiness.org/>



Outside Director Message

We have high expectations for global growth as JX Nippon Mining & Metals adopts dynamic changes to keep pace with the times.

JX Nippon Mining & Metals Corporation
Outside Director
Itoh Motoshige

[Profile]
Born in 1951 in Shizuoka Prefecture. Professor Itoh graduated from the University of Tokyo, Faculty of Economics in 1974. He obtained a Ph.D. in economics from the University of Rochester in 1979. His specialization is in international economics. After serving as a professor at the University of Tokyo, he assumed his current post as professor in the Faculty of International Social Sciences at Gakushuin University in April 2016. He has also been professor emeritus at the University of Tokyo since June 2016. Mr. Itoh served as a member of the Council on Economic and Fiscal Policy for six years beginning in 2013. He has been an outside director of the Company since April 2022.

My Role as an Outside Director

The JX Nippon Mining & Metals board of directors ensures the company meets the principles of the Corporate Governance Code, establishing governance functions comparable to those of listed companies, even though the company is not publicly traded itself. And since JX Nippon Mining & Metals is a manufacturing company in possession of superior proprietary technologies, the company's management team is a group of highly specialized professionals who naturally favor a focus on technology. As an economist, I recognize that one of the important roles I fulfill as an outside director is to provide an economic perspective to board deliberations. Over the next 10 to 20 years, we will see entire business model transformations in the manufacturing industry. I strive to express my own views on the intersection between the company's business and the economy in board meetings.

ESG Management and the Importance of Information Disclosure

Climate change, circular economy, and respect for human rights are the most important topics to address under the SDGs. Companies exist by making profits, but at the same time, it is important to provide sustainable value to all stakeholders. These stakeholders include the global environment, local communities, and employees. Further, I think we can say that society expects us to set more concrete targets and achieve specific results, not just abstract theories.

To address climate change, for example, JX Nippon Mining & Metals set an interim goal to reduce total in-house CO₂ emissions by 50% in fiscal 2030 versus fiscal 2018, achieve net zero by fiscal 2050. The group is taking a positive stance toward achieving the goal of net-zero CO₂ emissions by the year 2050. It won't be easy for the group to achieve this target. But I believe it is very meaningful to demonstrate a stance to society using

concrete data and examples.

In recent years, many so-called watchdog shareholders have nominated directors committed to decarbonization. In some cases, institutional investors have joined corporate boards in support of these nominations. This is a sign that investors around the world look beyond short-term profits, recognizing that climate change is a medium- to long-term business risk. In light of this trend, it will be increasingly important to engage in ESG finance, including transition finance. Expanding internationally required information disclosures, such as TCFD, will also be increasingly emphasized.

The Importance and Role of the Nonferrous Metals Industry

In economics, returns do not exist where there is no risk. JX Nippon Mining & Metals is investing aggressively in its Focus Businesses. In areas where demand is growing, such as semiconductors, battery recycling, and renewable energy, investments must be made to capture demand. In this context, the board must recognize the potential risks, and then strive to diversify and minimize those risks. In addition to climate change, which I mentioned above, geopolitical risks such as the friction between the U.S. and China are on the rise. I believe the company should take advantage of its broad product lineup to diversify risks, keeping a flexible mindset.

From my perspective as an economist, I believe the source of the strength of the Japanese economy lies in raw materials, and that the raw materials industry is indispensable to Japan. Every field related to materials requires a high level of expertise, and nonferrous metals are one of the fields in which the company plays its most important role. I look forward to JX Nippon Mining & Metals further refining the strengths it already possesses, growing globally as it undergoes dynamic transformations to meet the needs of the times.

Value Creation Model

Key Social Trends

<p>Expanding demand for advanced materials</p> <ul style="list-style-type: none"> The spread of COVID-19 has accelerated the advance of the data society, and demand is increasing for smart devices and communication infrastructure. As supply shortages of semiconductors and other materials become apparent, demand is increasing rapidly for materials to resolve these shortages. 	<p>Global acceleration in addressing climate change</p> <ul style="list-style-type: none"> As environmental issues become more apparent around the world, global companies are accelerating concrete actions to address climate change, particularly toward decarbonization. 	<p>Deepening mineral resource shortages/depletion</p> <ul style="list-style-type: none"> With greater resource consumption, competition is intensifying in acquiring high quality, low cost resources. There is focus on nonferrous metals to support future infrastructure and growing concerns about depletion
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The JX Nippon Mining & Metals Group works to identify and recognize the social issues calling for resolution by JX, and seeks to promote a value creation model in growing sustainably and resolving social issues.

Inputs (Capital)

- Financial capital**
- Intellectual capital**
- Human capital**
- Manufacturing capital**
- Social/Relationship capital**
- Natural capital**

Business Activities (Business Model)

Long-term Vision

By pivoting from being an equipment industry company to a technology-based company, we will realize a highly profitable structure even in the face of intensifying international competition and contribute to the realization of a sustainable society as targeted by the SDGs

Base Businesses

Businesses such as the mineral resources business and the smelting and refining business where we will enhance competitiveness and bolster the organizational foundation by further improving production efficiency, etc.

▶ Implementing structural reforms (e.g. thorough optimizations and reviewing resource portfolios) to maintain a certain level of profits

Focus Businesses Core of our growth strategy

These businesses, like advanced materials and technology-based recycling, establish competitive advantage by using technology to differentiate

▶ Expanding the scope of revenue by building a system that constantly maintains a product/technology lineup with small-lot, diverse production and high profitability

Materiality ▶ P35

Given the business environment where the Group operates and society's changing demands, we have established six materialities (priority issues) that we will prioritize, incorporating them into specific activity plans.

- Contributing to Environmental Conservation ▶ P47
- Provide Advanced Materials That Support Lives and Lifestyles ▶ P61
- Create Attractive Workplaces ▶ P77
- Respect Human Rights ▶ P89
- Coexistence and Co-Prosperity With Local Communities ▶ P94
- Strengthen Governance ▶ P99

Sustainable Copper Vision ▶ P23

Offer a stable supply system to support growing demand and conduct ESG-oriented production and supply (decarbonized, circular economy, etc.)

Medium-Term Management Plan ▶ P11

- Mineral Resources Business** ▶ P29
- Metals & Recycling Business** ▶ P30
- Functional Materials Business** ▶ P31
- Thin Film Materials Business** ▶ P32
- Tantalum and Niobium Business** ▶ P33
- Titanium Business** (Toho Titanium Co., Ltd.) ▶ P34

Outputs (Products/Services)

- Refined copper**
- Treated rolled copper foil**
- Sputtering targets**
- High-purity tantalum powder**
- Titanium sponge**

Outcomes (Created Value)

Advanced materials-derived products support a data-driven society, contributing to rich, convenient lifestyles

Limited resources are effectively utilized through recycling technologies, realizing a rich and sustainable world

Conducting community-based social contribution activities at domestic & overseas locations, as we have consistently valued harmony with local communities since our founding

Sustainable Copper Vision

The JX Nippon Mining & Metals Vision for Sustainable Copper

Why is Copper Required?

Copper is an essential material for achieving carbon neutrality, thereby copper suppliers and users are regarded as Green Enablers.

Upstream Change in Power generation mix

Power generation mix reliant mainly on fossil fuels such as coal and gas



Emergence and expansion toward renewable energy sources such as wind and solar power

4x Renewable energy requires about four times more copper per MW of generating capacity than fossil fuels

- Fossil fuels: Up to 1 ton/MW
- Renewable energy: Up to 4 tons/MW



Mid-Stream Expanded transmission and distribution

Power supply through centralized transmission and distribution systems of electricity



Transmission to decentralized transmission and distribution systems

2x Decentralized network requires about twice as much copper as compared to the conventional supply grid

- Centralized: Up to 10 tons/km
- Decentralized: Up to 20 tons/km



Downstream Shift in electricity usage

Vehicle design and supply chain creation using internal combustion engines as the energy source



Conversion of energy sources in connection with the spread of environmental friendly vehicles (EVs, FCVs*, etc.)
*Fuel cell vehicles

4x Electric Vehicles incorporate and use about four times more copper than internal combustion engine vehicles

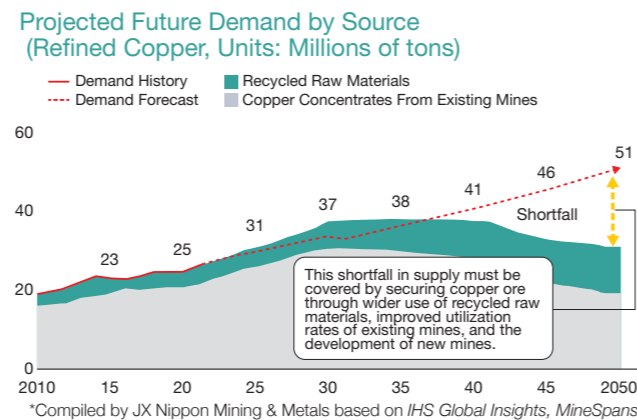
- Internal combustion engine vehicles: 24 kg/vehicle
- Electric Vehicles: 94 kg/vehicle



What is Sustainable Copper?

Meeting increasing demand for copper requires an increased supply of copper ore and recycled raw materials

While demand for copper will continue to grow over the long term, the supply of copper ore and recycled raw materials from existing mines is limited, and the supply-demand balance for copper is likely to be very unstable. This delicate balance is why copper ore and recycled raw materials will be essential in meeting the demand for copper, without which the world cannot achieve decarbonization.



KEYWORDS

Carbon Footprint (CFP): The amount of greenhouse gas emissions throughout the entire life cycle of a product or service, from procurement of raw materials to disposal and recycling, converted to CO₂.

Green Hybrid Smelting for Sustainable Copper that fulfills two missions

Achieving Two Missions in Parallel

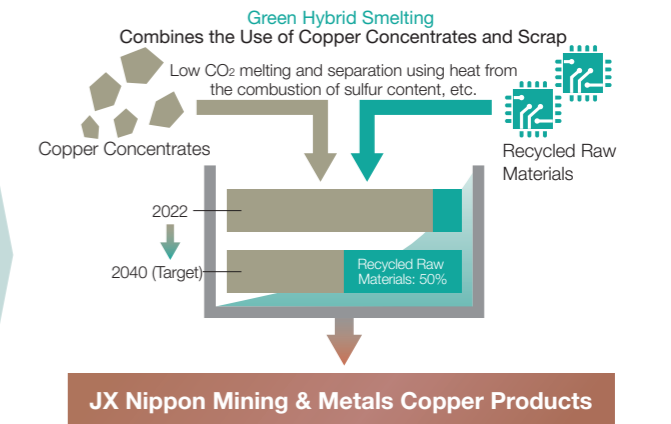
Offer a Stable Supply System to Support Growing Demand

Conduct ESG-Oriented Production and Supply (Decarbonized, Circular Economy, Etc.)

- **Stable Supply Capacity**
Ensure stable supply capacity to meet growing copper demand by a hybrid combination of copper concentrates and scrap raw materials
- **Reduce Carbon Footprint (CFP)**
Maximize the utilization of heat from the combustion of sulfur content, etc., contained in copper concentrates and use renewable energy in mines and smelters, etc.
- **Increase Percentage of Recycled Raw Materials**
Increase the percentage of recycled raw materials (input ratio of raw materials or content ratio in products) to 50% or more through technological development, the establishment of a raw materials collection system, etc.
- **Promote Responsible Procurement**
Acquire the Copper Mark* (industry ESG standard), etc.
- **Make Capital Investments**
Continue to invest in facilities to increase production of high-performance copper products that support higher percentages of recycled raw materials, greater energy efficiencies, etc.

* In March 2022, the Saganoseki Smelter & Refinery and Hitachi Works of JX Metals Smelting Co., Ltd. began procedures to obtain Copper Mark certification. Copper Mark is an international accreditation for responsible copper production. This is the first attempt by a company in the Japanese nonferrous metal industry to earn this accreditation.

Green Hybrid Smelting



We supply copper products through Green Hybrid Smelting. Both copper concentrates and scrap can be used as raw materials. The heat generated by the copper concentrates itself can be used to melt recycled materials, making fossil fuels virtually unnecessary.

Green Hybrid Smelting has been selected as one of the 26 most noteworthy examples of Japan's circular economy initiatives in Case Studies (2022) published by the Japan Partnership for Circular Economy, which was established by the Ministry of the Environment, the Ministry of Economy, Trade and Industry, and Keidanren.

What Measures Will We Take?

We will pursue four measures to evolve and gain wider use of Sustainable Coppers.

1 Reduce CFP

Reduce CFP in Copper concentrates mining and the transportation value chain

- Convert construction equipment used in mines to electric power
- Use electricity derived from renewable sources
- Improve efficiencies and optimize transportation, etc.

2 Increase recycling ratios

Develop technologies to increase the ratio of recycled raw materials for copper products and bolster raw materials collection systems

- Develop technologies to increase the ratio of recycled raw materials
- Expand facility capacity to increase recycled raw materials collection, etc.

3 Promote responsible procurement and other measures

Engage in a wide range of ESG measures, including sustainable sourcing, and certification acquisition

- Pursue measures that consider and encourage global environmental conservation, human rights, and contributions to local communities
- Acquire Copper Mark and other certifications that meet ESG standards set by the International Copper Association (ICA)

4 Form Green Enabling Partnerships

Evolve and gain wider use of sustainable copper

- Form partnerships with companies that work together to promote sustainable copper, and accelerate the transition to decarbonized and circular economies
- Engage in product and scrap collection, raw materials reuse, and joint technology development with partners, etc.

Four Measures to Evolve Sustainable Copper

1 Reduce CFP

Reduce Scope 1 and 2 CO₂ emissions

We are striving to reduce Scope 1 CO₂ emissions (fuels and industrial processes) through energy conservation, fuel conversion, and carbon capture and recycling. In connection with Scope 2 emissions (electricity), we completed the switch to CO₂-free electricity or renewable electricity sources at the Caserones Copper Mine, the Saganoseki Smelter & Refinery and Hitachi Works operated by JX Metals Smelting Co., Ltd., and other major sites in Japan and overseas. We reduced CO₂ emissions significantly as a result of these efforts. We are also considering the generation of our own renewable energy sources.



The Caserones Copper Mine has reduced CO₂ emissions significantly by switching to electricity derived from renewable sources

Reference → Special Feature 2: The JX Nippon Mining & Metals Group Climate Change Strategy ⇒ P37

Scope 3 CO₂ Emissions Reduction

The JX Nippon Mining & Metals Group strives actively to reduce Scope 3 CO₂ emitted from other companies within our supply chain. For example, the Group is considering a conversion to EVs and FCVs, latest technologies for transportation (see below), and the introduction of alternative fuels in connection with our logistics activities. Mines other than the Caserones Copper Mine in which we have an equity stake are pursuing CO₂-free electricity and the electrification of heavy machinery.



3 Promote responsible procurement and other measures



The Saganoseki Smelter & Refinery and Hitachi Works operated by JX Metals Smelting Co., Ltd. are working toward Copper Mark certification under an audit of 32 ESG criteria (see list at right) as defined by the International Copper Association (ICA).



Saganoseki Smelter & Refinery, JX Metals Smelting Co., Ltd.



Hitachi Works, JX Metals Smelting Co., Ltd.

- | | |
|---|--|
| 1. Compliance with laws and regulations | 18. Waste management |
| 2. Ethics | 19. Deposition site management |
| 3. Stakeholder engagement | 20. Contamination, pollution |
| 4. Supplier relations | 21. Biodiversity, protected areas |
| 5. Child labor | 22. Mine closure planning |
| 6. Forced labor | 23. Community health and safety |
| 7. Freedom of association and collective bargaining | 24. Community development |
| 8. Discrimination | 25. Small-scale mining |
| 9. Gender equality | 26. Human rights |
| 10. Work hours | 27. Security and human rights |
| 11. Remuneration | 28. Indigenous rights |
| 12. Occupational health and safety | 29. Land acquisition and resettlement |
| 13. Grievance system | 30. Cultural heritage |
| 14. Environmental risk management | 31. Mineral resources supply chain due diligence |
| 15. Greenhouse gas emissions | 32. Transparency and disclosure |
| 16. Energy consumption | |
| 17. Water management and conservation | |

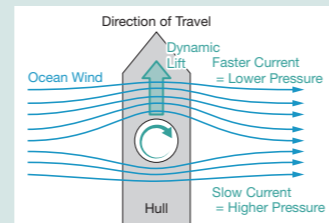
The Group is also bolstering ESG initiatives by conducting activities in accordance with the RBA Code of Conduct. Of the sites that underwent VAP audits to assess compliance with the RBA Code of Conduct, the Isohara Works and the Chigasaki Plant of Toho Titanium Co., Ltd. received a perfect score of 200 points, being awarded Platinum status, the highest status under the RBA certification program.

Case Study: New Technologies in Ocean Transportation

In collaboration with BHP, a major mineral resources company, we are looking into installing rotor sails on the KORYU, the JX Nippon Mining & Metals Group copper concentrates and sulfuric acid cargo ship. Rotor sails are a type of ship propulsion mechanism that uses the Magnus effect to convert pressure differences generated by the rotating cylinders on the hull into dynamic lift. We expect this mechanism to reduce CO₂ emissions by 5% as a result of fuel savings. Final safety verifications are underway, and we expect to install and begin operations in summer 2023 at the earliest.



KORYU After the Installation of Rotor Sails

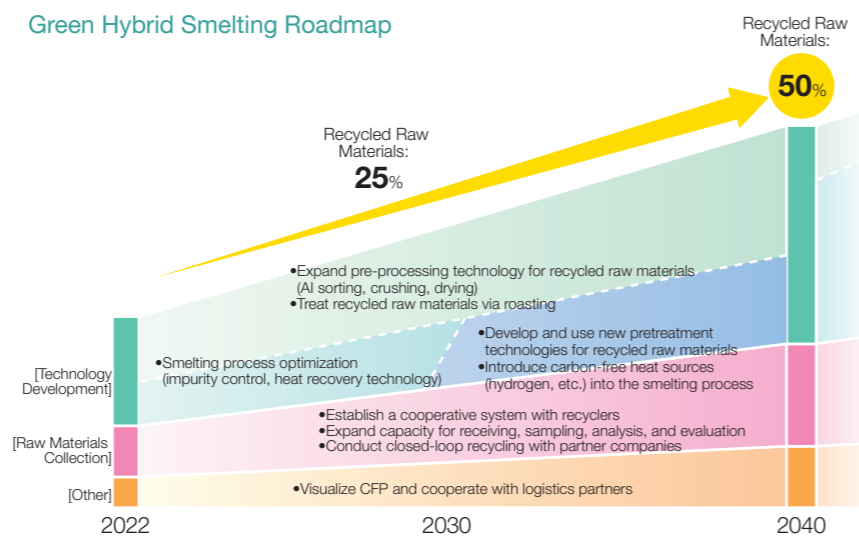


Dynamic lift is generated when the wind strikes a rotating object

Image of Magnus Effect

2 Increase recycling ratios

Our flash smelting furnace process not only uses the reaction heat of the raw copper concentrates efficiently to dissolve raw materials, but also uses the excess reaction heat to melt the recycled raw material, eliminating the need for fossil fuels or other resources. We pursue the optimal combination of copper ore and recycled materials through our Green Hybrid Smelting to achieve sustainable production of copper. Here, we aim to evolve Green Hybrid Smelting that uses 50% or more recycled raw materials (input ratio of raw materials or content ratio in products) by 2040. The table on the right shows specific issues and measures.



Case Study: Expanding Raw Materials Collection Systems

- Using AI to physically sort e-waste (waste home appliances and electronic devices) at the Hitachi Works
- Expanding raw materials collected at the JX Metal Smelting Co., Ltd. Oita Recycling Logistics Center
- Increasing the collection of raw materials by expanding our recycling center in Taiwan (Changpin Recycle Center)
- Acquired all shares of eCycle Solutions Inc., Canada's largest e-waste collection and processing company



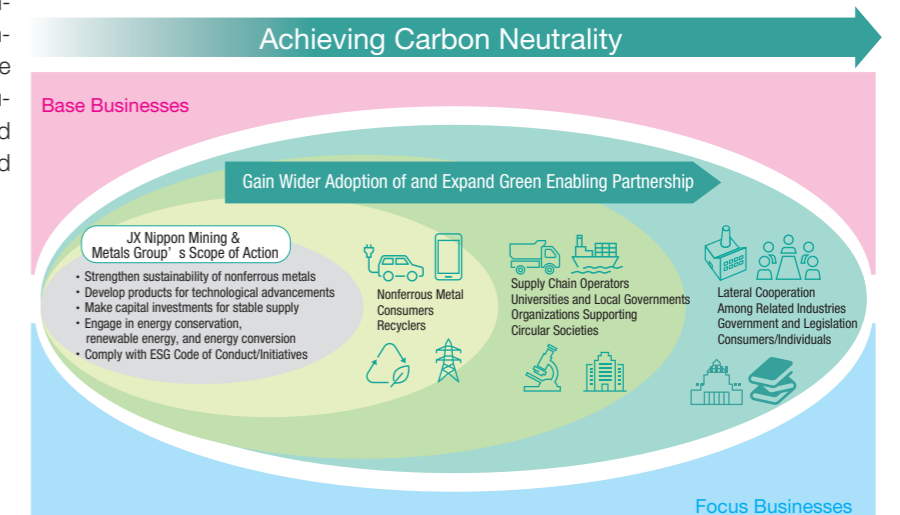
4 Form Green Enabling Partnerships



We form Green Enabling Partnerships with companies who work together to promote sustainable copper. Through these partnerships, we accelerate the transition to decarbonized, circular economies as well as engage in product and scrap collection, the raw materials reuse, and joint technology development.



Green Enabling Partnership Concept



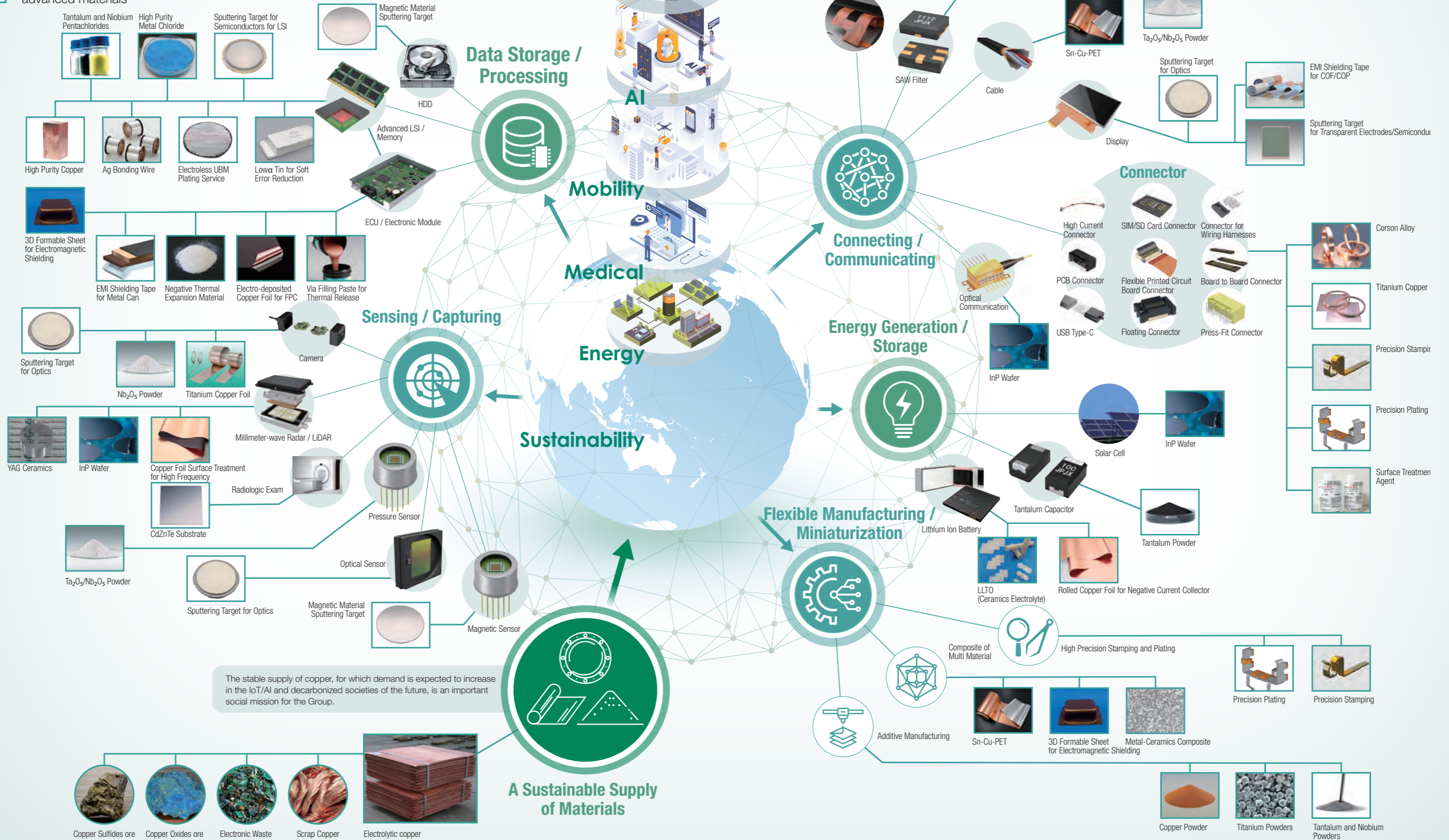
KEYWORDS

Scope 1: Direct greenhouse gas emissions from in-house fuel use and industrial processes
 Scope 2: Indirect greenhouse gas emissions from the use of electricity, heat, and steam supplied by other companies
 Scope 3: Greenhouse gas emissions of other companies related to business activities (e.g., use and disposal of products) other than Scope 1 and Scope 2
 Responsible Business Alliance (RBA): An industry association consisting mainly of electronics manufacturers and their suppliers, including many of our customers in the advanced materials field. The RBA works to improve social, environmental, and ethical aspects of the global supply chain

The JX Nippon Mining & Metals Group for the Future Society

As a leader in the nonferrous metals industry, our Group supplies nonferrous metal resources, such as copper, minor metals, and precious metals, as well as advanced materials. The resources we provide support the richness of society at its very roots, from infrastructure to electronic devices, and drive society's advancements.

 = The JX Nippon Mining & Metals Group's advanced materials



Mineral Resources Business

Since acquiring equity at the Caserones Copper Mine in Chile in 2006, we have taken a central role in its development, with copper concentrate production beginning in May 2014. We have further invested in some of the world's largest copper mines, including Los Pelambres and Escondida, also in Chile. The amount of copper produced (total equity base) reached about 190,000 tons in fiscal 2021.



JX Nippon Mining & Metals Corporation
Executive Officer, General Manager Mineral Resources Division,
Senior Executive Staff, Metals & Recycling Division, Senior
Executive Staff, Technology Group
Masaki Nobuharu

Key Strategies

- Establish stable operation and enhance business value at the Caserones Copper Mine
- Seek and promote new projects (exploration, development, and operation) with a prospect of supplying raw materials to our midstream and downstream businesses

Review of Fiscal 2021

At the Caserones Copper Mine, we maintained an optimal operation with consideration given to controlling COVID-19 and water usage restrictions. In addition, we have worked to make improvements for even more stable and efficient operations with introducing automatic control through cross-functional activities by the promotion team. Not only that, but we worked to make our equipment maintenance and materials procurement more efficient. Although production declined due to the impact of a strike in August during mining union labor negotiations, we successfully earned higher year-on-year profits in fiscal 2021, mainly due to higher copper prices.

On the other hand, due to a decrease in precipitation, the Los Pelambres Copper mine operated under water usage restriction in the second half of the year, resulting in lower production year on year.

As for new mine development projects, in the interest of

securing stable raw materials for downstream businesses, we established a cross-divisional project team to evaluate and study specific projects, focusing on tantalum and titanium.

Outlook for Fiscal 2022

At the Caserones Copper Mine, while continuing with controls for COVID-19, we will further strengthen our profitability through improvement of operation and maintenance that could increase operation level and promote cost improvements.

Regarding the Los Pelambres Copper Mine, we will focus on the completion of the expansion plan started in fiscal 2019. Also, with a prospect of starting businesses, we will move forward with the investigation and survey of various minerals around the world including minor metals and silicified ore in order to achieve stable supply of raw materials based on future needs in our midstream and downstream businesses.

Metals & Recycling Business

We are able to efficiently use our smelting processes to take copper concentrate and recycled raw materials and supply high-quality metal products such as copper and precious and minor metals. These products are then offered through a stable supply in Japan and parts of Asia. Under the Green Hybrid Smelting process, which utilizes surplus heat from copper concentrate processing, we will work to build a sustainable recycling-oriented society with the goal of increasing the ratio of recycled raw materials (either in raw material input or in product content) to at least 50% by 2040. In our detoxification processing treatment of industrial waste materials, we also use incineration and melting technologies aiming for "zero emissions," which means no generation of secondary waste destined for disposal to landfills.



JX Nippon Mining & Metals Corporation
Senior Executive Officer, General Manager, Metals & Recycling
Division, Senior Executive Engineer, Technology Group
Yasuda Yutaka

Key Strategies

- Pursue total maximization of the smelting and recycling businesses and promote productivity improvement
- Promote various measures to realize Green Hybrid Smelting

Review of Fiscal 2021

During fiscal 2021, we worked to increase the processing of copper concentrates from the Caserones Copper Mine and other mines in which we have equity, as well as to increase the processing of recycled raw materials that contribute to resource recycling, thereby strengthening the competitiveness of each of our manufacturing locations.

In the Recycling Business, in March 2021, we increased the processing capacity of the Changpin Recycle Center in Taiwan by 2.4 times and established the JX Metal Smelting Co., Ltd. Oita Recycling Logistics Center near the Saganoseki Smelter & Refinery. In addition, we expanded our pretreatment facilities, which began operations in April 2022. Efforts were also made to increase the recovery of minor metals. On the other hand, imports of recycled raw materials decreased due to reduced electrical and electronic waste discharged as a result of COVID-19, logistics disruptions, and rising freight fares, but efforts were made toward collection within Japan and neighboring regions to minimize impact.

In the Metals Business, the supply-demand balance for sulfuric acid tightened and export prices remained particularly high. Copper prices were high throughout the period. Purchase margins for raw material copper concentrates were low at the

beginning of the period, but gradually recovered against the backdrop of steady production ramp-ups at new mines and other factors.

Outlook for Fiscal 2022

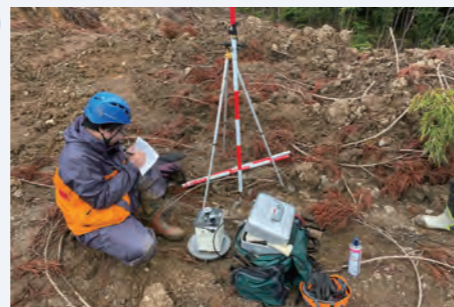
We will continue safe and stable operations at all sites, including the Saganoseki Smelter & Refinery. On the other hand, with no improvement expected in margins for purchasing raw material copper concentrates, we will maximize earnings by pursuing total maximization of the smelting and recycling businesses and improving productivity. Specifically, we will increase investment in facilities at the Saganoseki Smelter & Refinery, which is working towards increased processing of recycled raw materials, coupled with efforts to increase procurement of these recycled raw materials, including through acquisition of Canadian recycler eCycle Solutions Inc., pursuing an increase in processing of high-margin materials and a feed mix optimal for earnings.

In addition, we will promote initiatives to achieve net zero CO₂ emissions, improve operations and promote cost reductions by streamlining logistics between locations with a bird's eye view of the supply chain, and otherwise work to further strengthen our business and realize the SDGs and ESG.

TOPICS

Exploration Around the Kasuga and Iwado Mines (Fiscal 2021)

Currently, the JX Nippon Mining & Metals Group operates the Kasuga and Iwado Mines in Makurazaki City, Kagoshima Prefecture, where it mines and supplies gold-bearing silicified ore to the Saganoseki Smelter & Refinery. Silicified ore is an auxiliary raw material which is added during the copper smelting process. Gold-bearing silicified ore contributes not only to the stable operation of copper smelters but also to maintaining profitability in our Base Businesses. The Mineral Resources Division has been promoting exploration activities since fiscal 2018 in the areas surrounding the Kasuga and Iwado mines in order to develop new gold-bearing silicified ore mines. In fiscal 2021, we conducted detailed geological, geochemical and geophysical surveys to determine ore volume and gold content in the prospective mining areas identified in the previous surveys, and to as well as the distribution of surface gold grades.



Geophysical exploration in progress

TOPICS

Initiatives to Increase Collection and Treatment of Recycled Raw Materials

In Japan, we have established the JX Metal Smelting Co., Ltd. Oita Recycling Logistics Center (Oita City, Oita Port, Ozai Nishi-ku), a new collection base for recycled raw materials. Operations there launched in October 2021. In addition, we expanded our kiln furnaces, which are pretreatment facilities for recycled materials, at the Saganoseki Smelter & Refinery. In January 2022, we began test runs of these facilities, successfully launching full-scale operations in the following April. Meanwhile, overseas, we will acquire eCycle in fiscal 2022 as mentioned above and are promoting the procurement of more recycled raw materials by utilizing our overseas locations. Through these efforts to further increase the volume of recycled raw materials handled, we will contribute to building a sustainable recycling-oriented society and strengthen the competitiveness of our businesses.



JX Metal Smelting Co., Ltd. Oita Recycling Logistics Center

Functional Materials Business

Employing advanced metal fabrication technology cultivated over the years of business, JX Nippon Mining & Metals has become a global supplier of treated rolled copper foils used in flexible printed circuit boards, as well as of precision Cu alloy products including titanium copper, Corson alloy, and phosphor bronze - all used in connectors, semiconductor lead frames, and other parts. We are also engaged in precious metal plating and stamping, as well as other processes, on a global scale.



JX Nippon Mining & Metals Corporation
Senior Executive Officer, General Manager, Functional Materials Division, Senior Executive Staff, Technology Group
Hyakuno Manabu

Key Strategies

- Expand applications of the rolled copper foil and advanced copper alloy products, and improve profitability
- Strengthen production capacity to expand business

Review of Fiscal 2021

The spread of COVID-19 and the advances in work-style reforms have resulted in lifestyle changes such as the spread of working from home and online education. This has led to continued demand growth in the core markets for our products, particularly in the fields of electronic devices such as smartphones, tablets, and PCs, and in communication infrastructure including base stations and data centers. Our treated rolled copper foil and copper alloy strip production facilities, which launched operations in fiscal 2020, continued full production throughout the year, and we successfully increased production and sales to respond to the current expansion in demand. In response to future growth in demand, we will achieve further improvements in efficiency and productivity, and by bolstering Group manufacturing facilities, will increase manufacturing capacity at each of the Group's sites thus expanding our production structures and strengthening our business foundations.

TOPICS

JX Philippines Increases Surface Treatment Capacity in Treated Rolled Copper Foil for FPCs

In January 2022, JX Nippon Mining & Metals Philippines, Inc. (JX Philippines) completed the installation of treated rolled copper foil surface treatment facilities, launching operations in order to meet growing demand for rolled copper foil for flexible printed circuit boards (FPCs). In making this investment, we were able to achieve remote facility launch and start mass production operations even though equipment manufacturer engineers faced difficulties entering the Philippines due to immigration restrictions amid the COVID-19 pandemic.

This investment not only increases the production capacity of the entire JX Nippon Mining & Metals Group, but also contributes to strengthening our BCP by increasing production capacity at JX Philippines, helping to correct overconcentration of production capacity at the Hitachi Works.

JX Nippon Mining & Metals has the largest market share worldwide for these products, and we will continue to build a supply system in line with market trends in order to continue to provide the materials needed by society.



Facilities for treated rolled copper foil surface treatment

Outlook for Fiscal 2022

Although there is a sense of uncertainty about the future of demand for our advanced functional materials due to lockdowns in China imposed to fight the spread of COVID-19, demand for these materials continues to grow in cutting-edge fields such as electronic devices and telecommunication infrastructure applications.

In a society in which we need to achieve the SDGs, ESG, and decarbonization, we expect to see expanded demand for new applications such as in electric vehicles, recycling, and energy-savings, requiring more sophisticated and diverse materials characteristics. As a company, we will continue with the development of markets and technologies that anticipate changes in market needs, and strive to further bolster our production systems to address this growing demand.

Thin Film Materials Business

Employing world-class nonferrous metal manufacturing technologies, we are a supplier of a wide variety of sputtering targets including for semiconductor applications, compound semiconductor materials, high-purity metals, and surface treatment. These and many other materials and services, provided on a global scale, find use cases in end products such as advanced devices, leading-edge IT equipment, medical instruments, and electric vehicles



JX Nippon Mining & Metals Corporation
Executive Officer, General Manager, Thin Film Materials Division, Senior Executive Staff, Technology Group
Suwabe Takeshi

Key Strategies

- Establish a dynamic supply system to meet demand
- Strengthen new products and new business development capabilities
- Promote use of digital technologies for greater efficiency in manufacturing processes

Review of Fiscal 2021

Against the backdrop of growth in the overall size of the market driven by an accelerated digital transformation, the increased online-related demand resulted in growth in semiconductor-related markets. Amid this market expansion, fiscal 2021 saw continued strong demand for our mainstay products, such as sputtering targets for semiconductors, as customers increased production to cope with global tightness in semiconductor supply.

We had already increased our production capacity for sputtering targets for semiconductors in fiscal 2020, and have responded to growing demand by launching full-scale operation at these facilities. Furthermore, in order to meet current and future market needs, we have decided to further accelerate the expansion of our production system and reinforcement of our business foundation by launching construction of new plants around the world. We are also enhancing production capacity at our existing bases in a combined effort to significantly strengthen the production capacity of this product.

TOPICS

Expanded Production Capacity for Sputtering Targets for Semiconductors

Sputtering targets used for semiconductors are a mainstay product for the Thin Film Materials Business, mainly used in ultra-fine interconnects in leading-edge logic and memory chips, and demand for these continues to grow along with the move to a data-driven society. Factors such as telecommuting have resulted in increased demand for communications infrastructure and mobile terminals, and the semiconductor market is seeing accelerated growth. Looking forward, this underlying trend is expected to continue with the development of 5G and digital transformations.

After enhancing capacity by approximately 80% versus fiscal 2020 levels, we will continue our efforts to meet growing demand by enhancing our production facilities for sputtering targets for copper, copper alloys, titanium, and tantalum used in ultra-fine interconnects for semiconductors.

Outlook for Fiscal 2022

While there is continued expansion of digital transformation, the economic environment is becoming increasingly uncertain due to factors such as the global advance of inflation and Russia's invasion of Ukraine. However, needs for advanced materials from this division are expected to expand further in the medium-to long-term, especially in semiconductor-related markets, due to market growth expected in various areas, including the full-scale deployment of 5th generation (5G) mobile communication systems, the increasing use of electrical equipment in automobiles, and the expansion of electronic device use in relation to decarbonization.

To meet these growing demands, we will steadily implement capital investments, including the construction of new plants, to increase our production capacity and thereby justifying the trust of our customers. In addition to contributing to the achievement of the SDGs through our products, we also intend to meet society's expectations by keeping our attention on new development trends in response to various market changes and solving problems through internal and external collaboration.



Production equipment used for semiconductor-grade sputtering targets such as electrolysis baths (Isohara Works)

Tantalum and Niobium Business

Germany-based Group company TANIOBIS GmbH (hereinafter "TANIOBIS") is one of the world's leading manufacturers of tantalum and niobium materials, with manufacturing and sales locations all around the globe. Primarily driven by TANIOBIS, we contribute to evolution of the IoT/AI society through stable provision of such products as metal powders used in capacitors and semiconductor materials, high-purity oxides for SAW devices and optical lenses, chlorides and compounds, and superalloy additives.



JX Nippon Mining & Metals Corporation
Senior Executive Officer, General Manager, Tantalum and Niobium Division
General Manager, Administration Dept., Tantalum and Niobium Division
Senior Executive Engineer, Technology Group
Iida Kazuhiko

Key Strategies

- In addition to strengthening the supply chain in stable procurement, etc. for raw materials and improving productivity and quality in our existing businesses, strengthen our customer-focused business model
- Generation of items and acceleration of commercialization in new businesses for the expansion of our business foundations

Review of Fiscal 2021

Product sales of high-purity tantalum powder for capacitors and high-purity tantalum powder for sputtering targets for semiconductors, a mainstay existing business, continued firm performance in fiscal 2021 due to the evolution of the IoT/AI society and increasing stay-at-home demand.

In order to meet the steady growth in demand for its products, TANIOBIS decided to invest in the expansion of its high-purity tantalum powder production facilities at its production site in Thailand, significantly increasing capacity. In addition, we aimed to expand our global market share through a number of activities. These included efforts to realize a raw material procurement portfolio that is resilient to supply and demand fluctuations, price fluctuations, and risk, and actions promoting the Customer First Project, in which sales, R&D, and manufacturing work in unison to develop a customer-focused business model in order to respond quickly and accurately to customers' technological needs. In new business development, in order to expand our business foundations, we have been promoting initiatives targeting product development and the creation of synergies through close collaboration with Group companies and others, and are steadily generating results toward the launch of new products.

TOPICS

Investing in Greater High-Purity Tantalum Powder Production Capacity

In order to meet strong demand for high-purity tantalum powder, TANIOBIS decided to invest in expanding production facilities in Thailand, significantly boosting capacity at its plant there. TANIOBIS will also strengthen its quality control system by establishing a new analysis building, as well as reinforce its development system to promptly respond to customer needs by installing new development and prototyping facilities. These facilities are scheduled to launch in sequence toward full operation by 2025. Going forward, we will continue to provide a stable supply of high-purity tantalum powder to meet market expectations.



TANIOBIS's Thailand plant

Outlook for Fiscal 2022

Given that demand is expected to continue growing for the achievement of IoT/AI society, we expect demand to remain strong for our mainstay products of high-purity tantalum powder for capacitors and sputtering targets for semiconductors. Under these circumstances, we will work to attain even stronger competitive advantage by promoting customer sales activities that integrate sales and technology to further expand its market share and to optimize the product mix and reduce costs at each site, as well as by promoting the stable procurement of raw materials.

Furthermore, we made tantalum and niobium smelter Tokyo Denkai Co., Ltd. into a wholly owned subsidiary in April 2022, strengthening the vertically integrated supply chain. We will also promote activities to realize synergies in minor metals domains, especially niobium, through collaboration with TANIOBIS and other Group companies.

Titanium Business

Titanium, a light, strong metal resistant to corrosion, has wide-ranging uses, from aircraft to desalination plants, electric power plants, and other applications. Group company Toho Titanium Co., Ltd. is engaged in the smelting of titanium, and leverages related materials and technologies to manufacture such products as catalysts (for propylene polymerization) and chemicals (e.g. materials for electrodes and dielectrics in multilayer ceramic capacitors).



Toho Titanium Co., Ltd.
President & Representative Director, Chief Executive Officer
Yamao Yasuji

Key Strategies

- Strengthening revenue base by focusing investment in growth fields
- Rapidly generating revenue from the Saudi Arabia joint venture firm (ATTM)
- Generation and promotion of new businesses

Review of Fiscal 2021

In the Titanium Business, demand recovered for aircraft applications after a sharp drop amid the COVID-19 pandemic, and there were also signs of recovery in demand for general industrial applications. Alongside solid demand for semiconductor applications, sales increased substantially from the previous fiscal year. However, with regard to profits, costs rose sharply due to soaring costs of raw material copper concentrates, secondary materials, and transportation costs, which continued to put significant pressure on margins. Sales in the catalyst business increased year on year due to strong demand for catalysts for propylene polymerization, a mainstay product. In the chemicals business, sales of our mainstay product of multilayer ceramic capacitors (MLCC), a major application for nickel powder, recovered from a COVID-19 pandemic-driven decline in demand, and sales were significantly higher than the previous year due to increased 5G communications and automotive-related demand.

Outlook for Fiscal 2022

In the Titanium Business, demand for high-purity titanium for general industrial applications and semiconductor applications is also expected to remain strong, as demand continues to increase on the back of the ongoing recovery in demand for aircraft applications, in addition to replacement demand in response to the impact of Russia's invasion of Ukraine on the supply chain. Since our titanium sponge facilities at sites in Japan are already utilizing nearly all of their production capacity, we will cope with the increase in demand by raising the production volume of our affiliated company, a titanium sponge manufacturing joint venture in Saudi Arabia. In the catalyst business, we expect demand for polypropylene to remain strong, and sales volume is expected to increase with the start of operations at a new plant in November 2022. In the chemicals business, though the current demand for MLCC is in a temporary adjustment phase due to the semiconductor shortage and buildup of distribution inventories, we expect this to gradually dissipate and the business to return to a growth trajectory.

TOPICS

Boosting Capacity with the New No. 4 Nickel Power Plant

Nickel powder is used as an internal electrode material in multilayer ceramic capacitors (MLCC). Demand for nickel powder is increasing along with the growing demand for MLCC due to the increasing sophistication of electronic devices, advance of IoT, greater use of electrical equipment in automobiles, and the practical application of 5G. At Toho Titanium Co., Ltd., we built the new No. 4 nickel powder plant at the Wakamatsu Plant to strengthen the product's supply structure for use with low- and high-capacity MLCC, for which demand is expected to grow. Looking forward, we will target growth that beats the market.















New nickel powder plant at Wakamatsu Plant

Section 3 Materiality and ESG Management

Materialities (Priority Issues) and KPIs (Key Performance Indicators)

The JX Nippon Mining & Metals Group has identified six materialities for priority action in order to realize our 2040 Long-Term Vision. KPIs have been set for each materiality, and the ESG Committee, chaired by the president, administers this system, measuring and assessing levels of achievement for these KPIs.

	Materialities	Initiatives	Fiscal 2021 KPIs	Related SDGs
Environment	Contributing to Environmental Conservation P47	Contribute to global environmental conservation by creating a carbon-free and recycling-oriented society.	Total In-house CO ₂ Emissions: Promoting initiatives to achieve net zero CO ₂ emissions in fiscal 2050 and 50% reduction in fiscal 2030 (vs. fiscal 2018)	 
			Increase Percentage of Recycled Raw Materials/ Expand the Breadth of Recycled Materials to be Treated	
			Landfill Disposal Rate: Less than 1% in Fiscal 2021	
Social	Provide Advanced Materials That Support Lives and Lifestyles P61	Advance development of new technologies and contribute to an IoT/AI society.	Develop advanced materials needed by the IoT/AI society	  
			Build a framework to support technology-based management	
	Create Attractive Workplaces P77	<ul style="list-style-type: none"> Create a healthy, safe, and peaceful working environment for all employees. Create an environment in which diverse employees feel fulfilled and fully express their talents. 	Reduce Serious Occupational Accidents: Less than 0.7 accidents (four days or more of lost work time) per 1,000 workers in fiscal 2021	  
			Increase Annual Leave Utilization Rate: 80% or more in fiscal 2021	
			Implement initiatives to revitalize people and organizations	
			Initiatives for health promotion: cancer screenings for 70% of employees or more in fiscal 2021	
			Maintain and improve hiring rate for disabled persons: 2.3% or more in fiscal 2021	
Respect Human Rights P89	Conduct business activities that respect the human rights of all throughout the supply chain, including local community residents, customers, employees, and business partners.	Percentage of employees taking human rights training (100% in fiscal 2021)	 	
		Conduct survey of human rights in supply chains		
Coexistence and Co-Prosperity With Local Communities P94	Foster relationships of trust with local communities through community-based social contribution activities and communications in every business location in Japan and abroad.	Continue dialogue with local communities	 	
Governance	Strengthen Governance P99	Ensure sound, transparent business management via thorough compliance and risk management activities.	Steady operation of Group-wide risk management	-
			Compliance training tailored to business characteristics and social movements, etc.	

Materiality Identification Process

The following steps were taken to identify the Group's materialities, based on global social issues and the goals set forth by the SDGs, as well as international guidelines (GRI, ISO 26000, etc.), initiatives in Japan and overseas (EITI, ICMM, etc.), and

trends among industry peers. The identified materialities will be periodically reviewed in accordance with future changes in social conditions and needs, management strategies, and other factors.



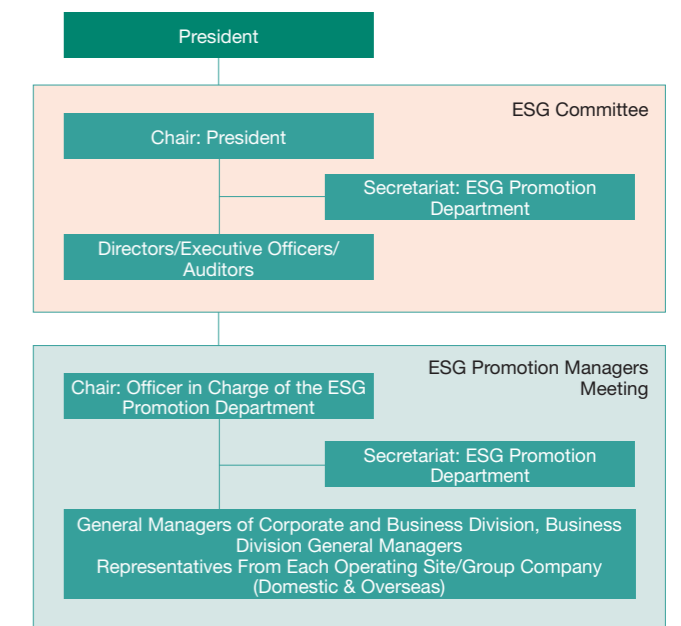
ESG Promotion System

Though the Group has taken a variety of actions over the years toward social contribution and environmental conservation, it has become necessary to strengthen organizational response to global ESG trends and take actions toward ESG management from a Group-wide perspective. Therefore, in October 2020, we established the ESG Promotion Department to oversee ESG initiatives, and created related committees to assist.

The ESG Committee serves as an advisory body to the president, and is responsible for basic policies and activity plans related to ESG initiatives, as well as monitoring of these initiatives. The ESG Committee is chaired by the president of the Company, with members from the Executive Council and with participation by outside directors as observers. This committee meets twice a year in principle. In addition, in order to promote and permeate ESG activities throughout the Group, we have established the ESG Promotion Managers Meeting as a subordinate body to this committee, consisting of the ESG promotion managers from each of the Company's departments and each Group company. Important ESG-related matters are discussed and reported to the Board of Directors and the Executive Council as appropriate.

In fiscal 2021, ESG Committee meetings were held in June and November to discuss activity policies for each priority issue and report on the status of activities.

ESG Promotion System Diagram



Permeating ESG Management

In order to promote the penetration of ESG management, we use the Group's Intranet and internal newsletters for messaging on ESG information, and we hold internal training and e-learning programs to deepen understanding about the importance of ESG and the Group's activities. In April 2021, the ESG Handbook was distributed to all Group employees, and training was initiated to further permeate ESG activities.

In addition, we distribute the Sustainability Report each year and conduct questionnaires available via paper form and online to survey employees about penetration of ESG and CSR mind-sets and status of their involvement with practicing ESG and CSR. In fiscal 2021, 5,347 people of 6,006 eligible employees responded to the survey, a response rate of 89%.

Excerpt of Questionnaire Responses

Q: Do you understand our ESG management initiatives?	
Yes	81.8%
Unsure	14.9%
No	3.2%
No answer	0.1%
Q: Do you understand and agree with the JX Nippon Mining & Metals Group Code of Conduct?	
Yes	92.7%
No	6.7%
No answer	0.6%
Q: Do you think materialities are well understood in your organization and workplace?	
Yes	78.0%
No	21.1%
No answer	0.9%



ESG Handbook

* Respondents have multiple options for answering questions, with affirmative answers categorized as "Yes" and negative answers as "No."

Special Feature 2

The JX Nippon Mining & Metals Group's Climate Change Strategy



With the adoption of the Paris Agreement in 2015, efforts to achieve a decarbonized society are gaining momentum on a global scale. At the JX Nippon Mining & Metals Group, we recognize that addressing climate change risk is a top priority management issue and are taking steps to that end.

Basic Approach and Vision

The Group has made environmental protection part of its corporate DNA since its founding, including when it rectified smoke pollution from the Hitachi Mine by constructing a large chimney stack, and in recent years has worked to continuously improve its environmental performance, including with respect to climate change. In 2020, we were among the first to participate in the Keidanren's Challenge Zero decarbonization project, and in July of the same year, we set the goal to reduce total in-house CO₂

emissions by 50% in fiscal 2030 versus fiscal 2018, achieve net zero by fiscal 2050. Furthermore, in May 2021, in order to become a leading ESG company in the nonferrous metals industry, we decided to bring forward our interim target of 50% reduction to fiscal 2030, in recognition that our reduction rates must be comparable on a global level. All of us at the Group are working to achieve these targets.

Achieving Our Long-Term Goals

In January 2021, as part of our efforts to achieve the aforementioned decarbonization vision, we launched the Carbon Free Project, a more than 60-member team led by members of the ESG Promotion Department, the Facilities Engineering Department, and the Procurement Department. Through this project, we have accelerated our efforts to realize a decarbonized society

by formulating a roadmap toward net zero emissions in fiscal 2050 and studying specific reduction measures. In addition, we have now examined our awareness of climate change risks and opportunities, as well as our medium- and long-term measures and strategies to address them, and have decided to disclose these in our Sustainability Report.

▶The JX Nippon Mining & Metals Group's Decarbonization Vision

Reduce total in-house CO₂ emissions by 50% in fiscal 2030 versus fiscal 2018, achieve net zero by fiscal 2050

Recent Initiatives

Fiscal 2020

- Set net-zero targets for fiscal 2050
- Declared participation in the Keidanren's Challenge Zero project
- Newly established the ESG Promotion Department
- Launched the Carbon Free Project

Fiscal 2021

- Decided to accelerate the interim CO₂ reduction target (50% reduction in fiscal 2040) by 10 years
- Strengthened communication with stakeholders
- Introduced an ESG investment quota

From Fiscal 2022

- Conducting disclosure based on the TCFD recommendations
- Endorsing the Ministry of Economy, Trade and Industry's GX League
- Developing the Sustainable Copper Vision
- Developing a transition-linked loan framework

Disclosure based on the TCFD Recommendations

In accordance with the TCFD's recommendations, the Group will strive to proactively disclose information based on the disclosure framework of Governance, Risk Management, Metrics and Targets, and Strategy. We will also take concrete measures to address climate change.



Governance

The ESG Committee, an advisory body to the president, is responsible for formulating basic policies regarding the Group's response to climate change, setting priority targets, and monitoring these targets. The ESG Committee is chaired by the president of the Company, with members from the Executive

Council and with participation by outside directors as observers. This committee meets twice a year in principle. Matters deliberated and decided are discussed at and reported to the Executive Council and the Board of Directors as appropriate, depending on the content.

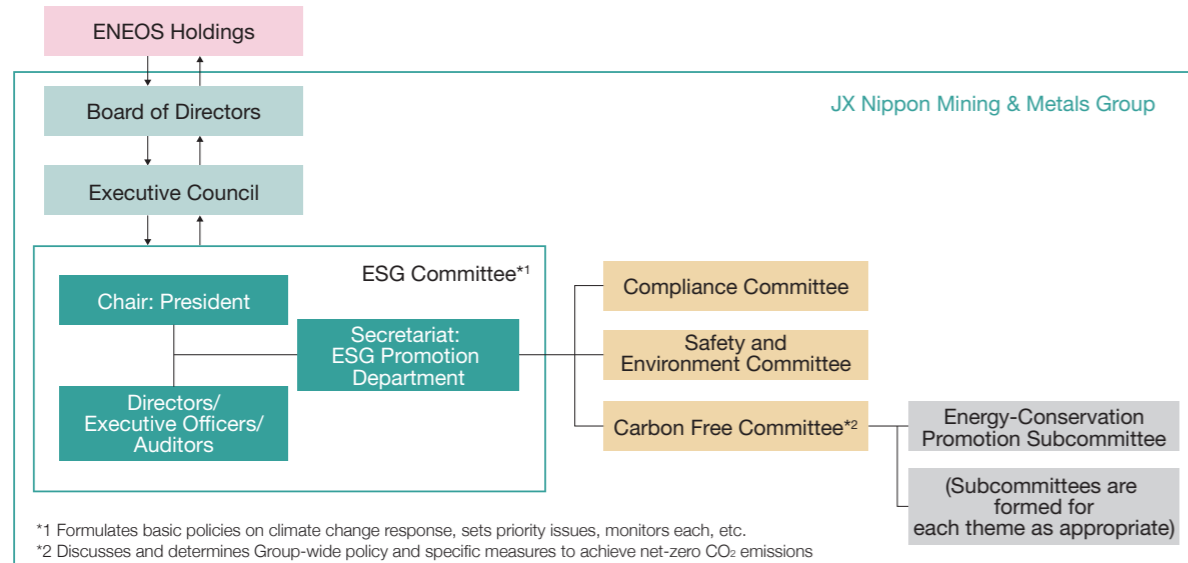
Risk Management

At the Group, the ESG Promotion Department works with each department to assess and identify risks and opportunities related to climate change, including scenario analysis, in accordance with the framework of the TCFD recommendations. The department recently collected and analyzed information on a wide range of risk factors associated with climate change impacts, including regulations and business impacts, and began to identify our own risks and opportunities related to climate change

response, as well as medium- to long-term business strategy measures.

The results of scenario analysis and the status of measure implementation are shared with management through the ESG Committee and other channels. Based on this, each department takes action in these areas in cooperation with the ESG Promotion Department.

Systems for Climate Change Action



Metrics and Targets

The Group has established its in-house CO₂ emissions (Scope 1 and 2) as an indicator of climate change and aims to achieve net-zero emissions by fiscal 2050. We have set an interim target

of a 50% reduction by fiscal 2030 versus Scope 1 and 2 total in-house emissions in fiscal 2018, based on backcasting from our fiscal 2050 goal.

Strategy

1. Recognition of Climate Change-Related Risks and Opportunities

● Analysis of climate change-related risks and opportunities

In identifying the risks and opportunities that climate change poses to our Group and its businesses, and in considering strategies to address risks and capture opportunities, we referred to the World Energy Outlook (WEO) of the International Energy Agency (IEA), the New Policies Scenario (NPS) of the WEO 2018, the Sustainable Development Scenario (SDS) in light of the Paris Agreement, as well as the Net Zero Emissions by 2050 Scenario (NZE Scenario) published in 2021. Furthermore, our analysis adopts global warming scenarios (from RCP2.6 to RCP8.5) from the Fifth Assessment Report (released in 2014) of the United Nations Intergovernmental Panel on Climate Change (IPCC).

● Identification of climate change-related risks and opportunities

Assuming a transition to a decarbonized society in the wake of climate change, the Group's businesses will play a major role in shifting the power generation mix to renewable energy sources, transforming power use in ways such as electrification, and achieving social implementation of the circular economy, and opportunities for increased product demand and evolution of our offerings are expected.

On the other hand, there are risks such as increased costs associated with the Group's own efforts to become carbon neutral on a global basis and lost opportunities due to delays in this process. In addition, there are potentially increased physical risks of extreme weather events damaging production facilities and logistics networks at operating sites in Japan and overseas, resulting in shutdowns.

Identified Risks and Opportunities

Category	Impact	Risk/Opportunity	Measures
Transition Risks	Policies and Regulations	Increased costs to achieve net-zero CO ₂ emissions Introduction and strengthening of carbon taxes, etc. in Japan and abroad	Reducing costs through the use of transition finance, energy-conservation activities, etc. Conversion to electricity derived from renewable energy sources, conversion to low-carbon footprint (low-CFP) and/or decarbonized fuels, and creating innovation and improvements in manufacturing processes
	Reputation	Loss of opportunity due to delayed action toward decarbonization and environmental impact reduction	Developing technology and making capital investments for decarbonization and reduction of environmental impact Disseminating and achieving the Sustainable Copper Vision through the formation of cross-industry partnerships (see page 26)
Physical Risks	Acute	Damage to facilities and shutdowns due to extreme weather events	Enhancement of our business continuity plans (BCPs) and regular training Establishing a Business Continuity Management (BCM)
Opportunities	Products	Increased demand for nonferrous metals needed for a decarbonized society (Base Businesses)	Making businesses more resilient through portfolio review Establishing a stable supply system through the evolution of Green Hybrid Smelting (see page 24)
		Increased demand for high-end electronic materials (Focus Businesses)	Making capital investments to meet demand Engaging in open innovation through industry-academia collaboration and investment in startups
	Circular economy	Realizing circular economy Increased demand for and mandated recycling of automotive LiBs	Making efforts to evolve Green Hybrid Smelting by increasing the recycling raw materials ratio (see page 24) Evolving sustainable copper through the formation of cross-industry partnerships (see page 26) Developing technologies, making capital investments, and engaging in industry-academia-government collaborations for closed-loop recycling of LiBs

2. Scenario Analysis

With the transition to a decarbonized and resource-recycling society, demand for nonferrous metals and advanced electronic materials related to our Group's businesses is expected to grow, and we believe that the key point is how to realize capacity expansion, technology development, and partnership building in order to meet this demand.

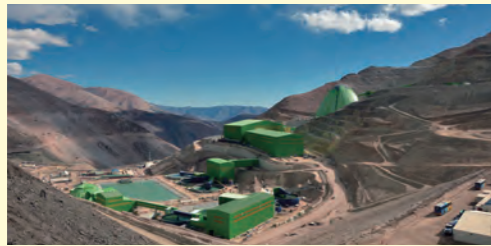
However, the results of the scenario analysis revealed the importance of smoothly transitioning the JX Nippon Mining & Metals Group to carbon neutrality and of evolving our BCPs to mitigate physical risks associated with natural disasters and minimize their impact when they occur.

(1) Transition Risks

(1) Increased costs to achieve net-zero CO₂ emissions

Electricity accounts for approximately 60% of our Group's CO₂ emissions (Scope 1 and 2), and we are switching to CO₂-free electricity at our major operating sites in Japan and overseas. We are also considering measures to generate renewable energy on our own and to address energy sources other than electricity used in our manufacturing processes.

Although additional costs are incurred in the necessary initiatives to achieve this, in the form of capital investment, R&D expenses, and the price difference (premium) between CO₂-free electricity and traditional electricity, we will steadily move toward decarbonization through the use of transition financing, a first in the nonferrous metals industry, and by reducing costs through energy-conservation activities.



Caserones Copper Mine (switched to CO₂-free electricity in January 2021)

(2) Introduction and strengthening of carbon taxes, etc. in Japan and abroad

Carbon taxes are being considered for introduction in Japan and abroad. If these or other systems are introduced, there is a risk of cost increases based on CO₂ emissions. If a carbon tax is introduced, the annual cost increase is expected to be approximately 5 billion yen*.

The Group has established a roadmap toward carbon neutrality and is steadily implementing various initiatives to reduce CO₂ emissions, so the cost burden is expected to be relatively insignificant.

* Fiscal 2018 Scope 1 and 2 emissions x 50% (2030 target) in t-CO₂e x USD50/t-CO₂e x assumed exchange rate

(3) Loss of opportunity due to delayed action toward decarbonization and environmental impact reduction

If CO₂ emission reductions do not proceed according to the roadmap or if other environmental impact increases, there is a risk that the Group may suffer harm to its social credibility. In addition, delays in responding to climate change-related requests from customers could result in reduced sales opportunities.

The Group is not only steadily promoting decarbonization initiatives and responding to individual customer requests, but it is also working to develop technologies and make capital investments to reduce its carbon footprint (CFP) and increase the percentage of recycled raw materials in accordance with the Sustainable Copper Vision (see page 23). We are also building partnerships with external parties to achieve and disseminate the Sustainable Copper Vision.



Physical sorting technology for recycled materials

(2) Physical Risks

(1) Damage to facilities and shutdowns due to extreme weather events

Extreme weather events, including intensifying typhoons, may cause damage to the Group's various facilities at operating sites in Japan and overseas. In addition, damage to our supplier and logistics networks increase the risk that we cannot sustain normal operation.

The Group has conducted analyses using hazard maps and other data at its major operating sites in Japan and confirmed that the risk of damage from extreme weather events is low. In addition,

we have established business continuity plans (BCPs), and conduct periodical training and reviews to promote the establishment of Business Continuity Management (BCM). We believe that these measures will keep the impact on our business to relatively minor levels even if the risk of damage to facilities or shutdowns due to extreme weather events materializes.

(3) Opportunities

(1) Increased demand for nonferrous metals needed for a decarbonized society (Base Businesses)

Needs for renewable energy and electrification of mobility are expected to grow significantly toward the realization of a decarbonized society, and copper and other nonferrous metals will be increasingly used in these areas.

JX Nippon Mining & Metals Group earned operating profit of approximately 113.1 billion yen in fiscal 2021 in the Mineral Resources Business and Metals & Recycling Business, and this growing demand is expected to provide opportunities for further sales and earnings growth for the Group. The Group is working to strengthen its business through portfolio reviews, and is taking various measures to increase the input recycling raw materials ratio and reduce its CFP in Green Hybrid Smelting, which utilizes both copper ore and recycled raw materials, in order to establish a stable supply system.

(2) Increased demand for high-end electronic materials (Focus Businesses)

In addressing climate change, it is essential to significantly improve energy use efficiency using technologies such as IoT, AI, and 5G/6G. Many high-end electronic materials are used in these fields, and demand for these materials is expected to continue to grow. The Group maintains product families with high global market share in the area of electronic materials, including sputtering targets and treated rolled copper foil for FPC, and in fiscal 2021 related businesses generated approximately 54.5 billion yen in operating profit.

Currently, we are constructing several new plants and increasing capacity to meet strong demand (see page 62). In addition, we are working to construct a new plant in Hitachinaka City, Ibaraki Prefecture (see page 71) and acquire a large site in the United States (see page 62) in anticipation of further growth in demand.

In addition to these capital investments, from a longer-term perspective, the Advanced Technology & Strategy Department is taking the lead in open innovation through industry-academia collaboration and investment in startups (see page 64 for specific examples).



Illustration of the completed Hitachinaka New Plant (tentative name)

(3) Realizing circular economy

Though demand for copper will continue to grow over the long term as the world moves toward a decarbonized society, the supply of copper ore and recycled raw materials from existing mines is limited.

The Sustainable Copper Vision we have established aims to build a stable supply system to support growing copper demand through Green Hybrid Smelting that utilizes both copper ore and recycled raw materials. As one of our measures to evolve and gain wider use of sustainable coppers, we are working on technological development to increase the recycled raw materials ratio (input ratio of raw materials or content ratio in products) to 50% or more by 2040. To this end, it is essential to enhance our system for collecting and processing recycled raw materials. Here, we will not only strengthen the supply chain through capital investment and M&A, but also form Green Enabling Partnerships with companies, local governments, universities, and research institutions who work together to promote sustainable copper. Through these partnerships, we engage in product and scrap collection, raw materials reuse, and joint technology development (see page 26).

(4) Increased demand for and mandated recycling of automotive LiBs

Electric vehicles (EVs) are expected to become widespread as part of a decarbonized society. This will increase demand for lithium, cobalt, and nickel used in lithium-ion batteries (LiBs) in EVs. There are also concerns about geopolitical risks and rising resource nationalism surrounding these resources. Future large-scale disposal of LiBs is also expected, requiring their efficient recycling.

The Group is working to develop technologies, conduct demonstration trials, and establish a resource recycling system throughout the supply chain with the aim of realizing closed-loop recycling to extract the aforementioned metals from automotive LiBs reaching end of life (EoL) in as automotive battery materials (see page 48).

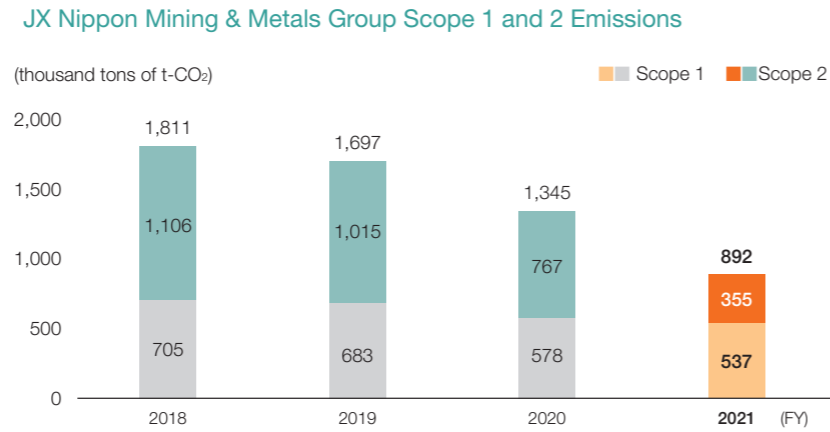


Bench scale equipment for LiB recycling

Initiatives from Fiscal 2021 to Today

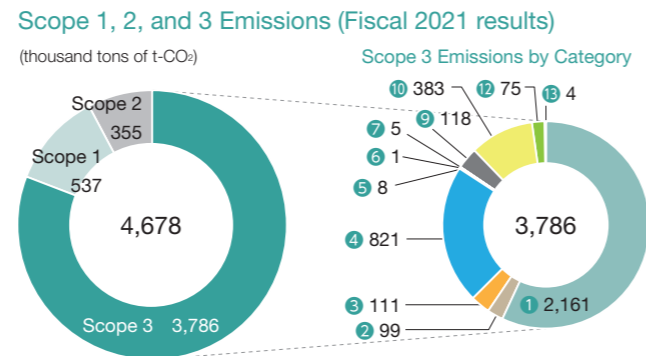
Reduction of CO₂ Emissions (Scope 1 and 2)

Toward the goal of reducing our total in-house CO₂ emissions in fiscal 2030 and fiscal 2050, we are working on four priority activities: (1) introduction of CO₂-free electricity, (2) generation of renewable energy, (3) promotion of zero energy loss activities, and (4) fuel switching and technology development toward decarbonization. As a result, our in-house CO₂ emissions in fiscal 2021 (total of Scope 1 and 2) were 892,000 t-CO₂.



Calculation of CO₂ Emissions (Scope 3)

In addition to existing data for Scope 1 and 2 CO₂ emissions, in fiscal 2021 the Group began calculating indirect Scope 3 emissions in order to determine the overall CO₂ emissions generated by our operations and products. Through a Group-wide initiative centered on the Carbon Free Project, we have calculated emissions results for fiscal 2020 and fiscal 2021, while obtaining insights from outside experts. Going forward, we will study ways to improve calculation methods and accuracy for each category, as well as to establish and implement emission reduction targets.



Scope 1 and 2 emissions are calculated for operating sites of high quantitative importance. Scope 3 emissions are calculated mainly for operating sites where production activities are conducted, and the scope of calculation is different for each category. Categories 8, 11, 14, and 15 were not calculated because the Group has no relevant activities in these areas.

Reference → Special Feature 1: Sustainable Copper Vision > Scope 3 CO₂ Emissions Reduction → Page 25

Scope 3 Categories

- ① Purchased goods and services
- ② Capital goods
- ③ Fuel and energy-related activities not included in Scope 1 or 2
- ④ Upstream transportation and distribution
- ⑤ Waste generated in operations
- ⑥ Business travel
- ⑦ Employee commuting
- ⑧ Upstream leased assets
- ⑨ Downstream transportation and distribution
- ⑩ Processing of sold products
- ⑪ Use of sold products
- ⑫ End-of-life treatment of sold products
- ⑬ Downstream leased assets
- ⑭ Franchises
- ⑮ Investments

Achieving Net Zero

The Group's CO₂ Emissions

In our assumptions for fiscal 2050, emissions are expected to increase due to business expansion over the course of time. In response to this, we aim to achieve net-zero total in-house emissions (Scope 1 and 2) in fiscal 2050 by combining energy conservation, purchase and in-house generation of renewable energy, electrification and fuel switching, process modification, and carbon capture and recycling*, centered on the four priority activities we have already launched.

* Includes the effects of recovery of CO₂ and other forms of carbon (pyrolysis oil, etc.) through combustion, etc. of recycled materials, enhanced physical sorting of recycled materials, increased ratio of biomass plastic in procured recycled materials, and CO₂ absorption through in-house efforts with forests, etc.

Society's Total CO₂ Emissions

Through our recycling business, specifically the evolution of Green Hybrid Smelting, and supply of advanced technological materials and products, we contribute to the reduction of CO₂ emissions in society as a whole. We not only strive to reduce the Group's CO₂ emissions to net zero, but also to reduce the CO₂ emissions of society as a whole.

Priority Activity #1

Introduction of CO₂-Free Electricity

Since approximately 60% of the Group's in-house CO₂ emissions come from electricity, we began introducing CO₂-free electricity* in fiscal 2020. In January 2021, we began with the introduction of CO₂-free electricity at the Caserones Copper Mine, which accounted for approximately 20% of the Group's total electricity consumption in 2018. Then, in fiscal 2022, the switch to CO₂-free electricity was completed at all major operating sites in Japan, except for some sites with contractual restrictions. We are also gradually switching electricity at our operating sites outside Japan.

* CO₂-free electricity: Electricity derived from virtually non-fossil-fuel power sources, etc. and that does not result in CO₂ emissions, with an adjusted CO₂ emission factor of 0.00 t-CO₂/kWh. This may include nuclear power as well as renewable energy such as hydro, wind, solar, etc.



Kurami Works



Isohara Works

Priority Activity #2

Generation of Renewable Energy

Japan and other countries around the world where we operate have set targets to increase the percentage of renewable energy, but these targets are not quantitatively sufficient to achieve carbon neutrality for society as a whole. In addition to purchasing CO₂-free electricity, the Group is also committed to generating its own renewable energy.

To date, we have introduced hydroelectric, binary, and solar power generation facilities at our operating sites in Japan and overseas, and in February 2022, the first on-site solar power generation facility using a PPA* began operation at the Kakegawa Works of JX Metals Precision Technology Co., Ltd. In June 2022, the Isohara Works also started solar power generation via PPA, all of which is consumed in-house. Going forward, we will continue our efforts to expand the generation of renewable energy through various schemes.

* PPA: Power Purchase Agreement. A system in which a company or other facility owner leases its premise, roof, or other space, a power company installs a solar power generation system, and the facility owner uses the power generated and pays a fee



Solar power generation equipment installed on the roof of the Kakegawa Works



Solar power generation equipment installed on the roof of the Isohara Works

Renewable Energy Facilities and Total Electricity Generation (Fiscal 2021) (Thousands of kWh)

Kakinosawa Power Plant, JX Nippon Mining & Metals Corporation	Hydroelectric	25,636
Kakegawa Works of JX Metals Precision Technology Co., Ltd.	Solar	979
Shimoda Hot Springs Co., Ltd.	Binary	340
Nikko Metals Taiwan Co., Ltd.	Solar	235

Priority Activity #3

Promotion of zero energy loss activities

As a Group that operates in an electricity-intensive industry, we have been promoting energy conservation activities at every stage of our business activities for some time. However, we believe it is now necessary to promote zero energy loss activities from new angles in order to achieve net-zero CO₂ emissions. For example, we will take on the challenge of achieving zero energy loss by soliciting ideas from all Group employees, such as updating facilities with a focus

on CO₂ reduction that goes beyond cost reduction focus, and fundamentally reviewing facility operation methods.

In order to promote such initiatives, we have established a 20 billion yen ESG investment quota in the current medium-term management plan. In the ESG investment quota, we have introduced internal carbon pricing (ICP), albeit on a limited basis, to financially support initiatives that contribute to ESG, including decarbonization.

Priority Activity #4

Fuel switching and technology development toward decarbonization

In addition to electricity, our business processes use heavy oil, coke as a reducing agent, and other energy sources, and we are working to reduce CO₂ emissions from these sources. One candidate to achieve this is fuel switching. In the industry, technologies are being developed for new fuels such as hydrogen and ammonia, and we will also consider the use of these fuels.

As an example of technological development, in February 2021 we announced our participation in the second phase of the Japan Technological Research Association of Artificial Photosynthetic Chemical Process (ARPCChem). Artificial photosynthesis is a technology that uses solar energy and catalysts to break down water into hydrogen and oxygen, and then reacts the hydrogen with carbon dioxide to produce fuels and chemical raw materials. Global development of this technology is being pioneered by Japan.

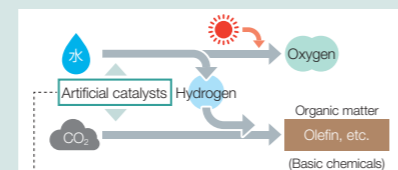
As efforts to achieve carbon neutrality accelerate worldwide, interest is growing in this technology for generating green hydrogen^{*1}. ARPCChem, the association we have joined in this area, is a research consortium formed by the Ministry of Economy, Trade and Industry for the purpose of realizing artificial photosynthesis technology. During the first phase of activities conducted from 2012 to 2021, the association achieved a number of results such as the world's first successful proof of concept of artificial photosynthesis. In the second phase of its activities, which will span the next 10 years, leading Japanese companies and research institutes^{*2} will bring together their specialized technologies to develop catalysts, develop hydrogen separation membranes, and verify safety, with a view to implementing these technologies in society.

By providing high purity metals such as tantalum and titanium, as well as a variety of technologies we have culti-

ivated over time, we will also contribute to the development of catalysts that will help improve the conversion efficiency of solar energy.

^{*1} Hydrogen produced by breaking down water. Hydrogen can be produced without emission of a carbon dioxide by-product by using renewable energy in the breakdown process
^{*2} Participating companies and research institutes in ARPCChem
 Companies: JX Nippon Mining & Metals Corporation, Kyocera Corporation, Dai Nippon Printing Co., Ltd., Dexerials Corporation, Toray Industries, Inc., Toyota Motor Corporation, Nippon Steel Corporation, Furuya Metal Co., Ltd., Mitsui Chemicals, Inc., Mitsubishi Chemical Corporation, INPEX Corporation
 Research Institutes: Gifu University, Kyoto University, National Institute of Advanced Industrial Science and Technology, Shinshu University, The University of Tokyo, Tokyo University of Science, Tohoku University, Nagoya University, Miyazaki University, Yamaguchi University

Illustration of Artificial Photosynthesis Technology



High Purity | Surface Control | Analysis
 We are engaged in the research and development of catalyst materials that are essential for the production of hydrogen. Catalysts for artificial photosynthesis function in the same mechanism as semiconductors and can therefore be applied to our various technologies.

*Prepared by JX Nippon Mining & Metals based on information on the website of the Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry



Test plant for artificial photosynthesis technology (courtesy of ARPCChem)

Column

Sustainable Finance Initiatives

The Group utilizes sustainable finance as part of its efforts to realize a decarbonized, circular economies. Sustainable finance is a method of guiding the promotion of solutions to environmental and social issues from a financial perspective. Our Group pioneered this method in its industry in order to reduce financing costs and expand business opportunities for continuous and systematic activities.

Expectations for Transition-Linked Loans

In recent years, as more emphasis has been placed on sustainable finance, a new financing method called transition-linked loans (TLL), which is different from conventional green bonds and sustainability-linked loans, has been attracting attention.

Traditional approaches have been predicated on the assumption that decarbonization would be achieved in line with the level of the Paris Agreement GHG reduction targets. However, concerns have arisen that GHG-intensive industries, where rapid decarbonization is challeng-

ing, would be delayed in receiving support. However, TLL allows for valuation of even a company's long-term transition strategy itself, making it possible to raise funds for a wider range of projects.

Currently, expectations are growing for TLL to serve as a mechanism to support the implementation of long-term transition strategies by industries with significant GHG emissions, and rules are being developed in Japan and overseas to this end.

The Group Formulates the First Framework in the Nonferrous Metals Industry

Under TLL, sustainability performance targets (SPTs) are set that are consistent with a company's transition strategy, and incentives are provided such as linking interest rate terms to the achievement of these SPTs. In June 2022, the JX Nippon Mining & Metals Group became the first in the Japanese nonferrous metals industry to develop a transition-linked loan framework (TLLF). This framework was developed with the support of Mizuho Bank, Ltd. and has acquired a third-party assessment regarding its applicability to various principles and guidelines, in-

cluding the Basic Guidelines on Climate Transition Finance established by the Ministry of Economy, Trade and Industry, the Ministry of the Environment, and the Financial Services Agency.

We have established two SPTs in our TLLF and linked the achievement of these SPTs to the interest rate terms of the TLL, thereby establishing a mechanism for us to commit to the implementation of our transition strategy.

Specific Targets for TLLF Initiatives

- SPT 1: Maintain 50% reduction of CO₂ emissions by fiscal 2030 (versus fiscal 2018)
- SPT 2: Increase the percentage of recycled raw materials to 25% by fiscal 2030

WEB JX Nippon Mining & Metals Corporation Transition-Linked Loan Framework

https://www.jx-nmm.com/english/newsrelease/fy2022/20220629_02.html



Financing Under the TLLF

Based on the framework we have formulated, the Company entered into a TLL agreement with Joyo Bank, Ltd. in June 2022. This is the first TLL project in the nonferrous industry in Japan, and will be used to cover the environmental costs of the New Hitachi-kita Factory (tentative name), a new production base for sputtering targets for semiconductors currently under construction in Hitachi City, Ibaraki Prefecture.



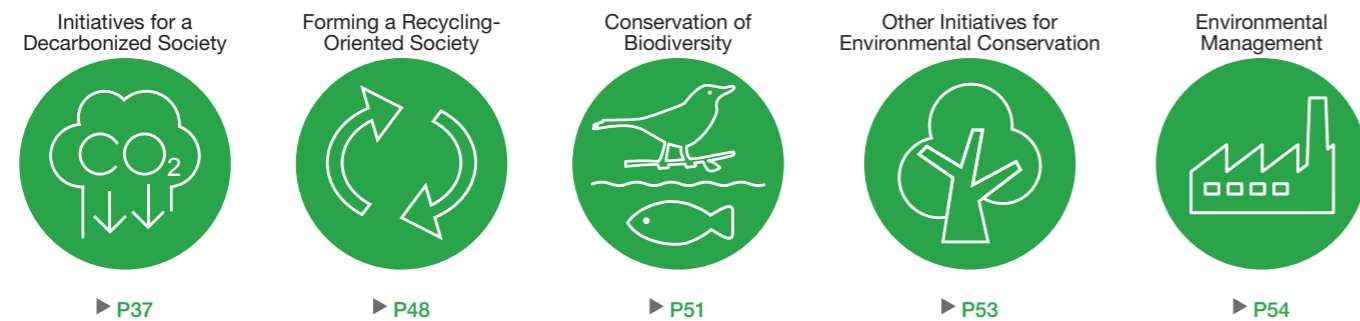
New Hitachi-kita Factory (tentative name)



Environment

Materiality 1 Contributing to Environmental Conservation

The Group maintains a keen awareness of the impact our business activities have on the environment, and our basic policy is to contribute to conservation of the environment on a global scale by promoting the development of technologies that enhance the productivity of resources and materials. Furthermore, as we execute business, we seek to reduce our environmental impact at every stage of the supply chain.



KPIs and Progress

Assessment: 😊 Achieved / Steady Progress ☹️ Not Achieved

KPI	Fiscal 2021 Results/Progress	Assessment
Total in-house CO ₂ Emissions: Promoting initiatives to achieve net zero CO ₂ emissions in fiscal 2050 and 50% reduction in fiscal 2030 (vs. fiscal 2018)	We continued our activities through the Carbon Free Project, which was launched to achieve these targets, and promoted a variety of initiatives for decarbonization, including the introduction of CO ₂ -free electricity at each of our sites and the creation of roadmaps per division toward net zero emissions.	😊
Increase Percentage of Recycled Raw Materials: Expand the Breadth of Recycled Materials to be Treated	We have been working to increase the percentage of recycled raw materials (input ratio of raw materials or content ratio in products) to 50% or more by 2040 used in copper smelting by expanding our facilities for greater treatment of recycled materials and improving logistics efficiency.	😊
Landfill Disposal Rate: Less than 1% in Fiscal 2021	We have set a goal of keeping our landfill disposal rate at no more than 1.0% in order to cut down on waste with the aim of minimizing our impact on the environment. Our landfill disposal rate in fiscal 2021 was 0.68%.	😊

Initiatives for a Decarbonized Society

The JX Nippon Mining & Metals Group views climate change as an urgent issue that must be resolved on a global scale, and in order to contribute to the resolution of this issue, we have set the ultimate goal of achieving net zero CO₂ emissions and are further accelerating our efforts to achieve this goal.

Reference → Special Feature 2: The JX Nippon Mining & Metals Group's Climate Change Strategy ⇒P37

Forming a Recycling-Oriented Society

At the Group, we recognize that the mission of players involved in the materials industry is to minimize resource final disposal through an ongoing cycle while maintaining the maximum value of these resources. Based on this concept, we aim to achieve a circular economy.

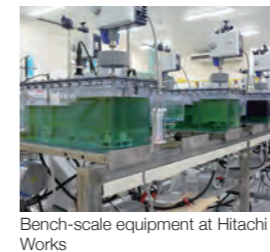
Reference → Special Feature 1: Sustainable Copper Vision ⇒P23

Closed-Loop Recycling of Automotive Lithium-Ion Batteries (LiB)

Minor metals such as nickel, cobalt, and lithium used in LiB are not produced in Japan, but are rather concentrated in a specific set of countries and regions. Reducing the environmental impact and supply chain risk associated with the use and securing of these mineral resources has become a serious social issue.

Since 2020, we have been working to develop technologies for achieving closed-loop recycling. In this process, minor metals are recovered from automotive LiBs reaching end of life (EoL LiBs) and used again as raw materials for automotive batteries, and we have installed continuous processing small-scale testing equipment (bench-scale equipment) for recycling automotive LiB at Hitachi Works. In the first half of fiscal 2021, JX Metals Circular Solutions Co., Ltd. began demonstration trials for high-purity nickel sulfate recovery, beginning similar tests for high-purity cobalt sulfate in the first half of fiscal 2022. Furthermore, we are targeting the launch of demonstration trials for the recovery of high-purity lithium carbonate in fiscal 2023.

Going forward, we aim to increase the recovery rate of metals contained in EoL LiBs waste automotive LiB and establish a process capable of complying with EU battery regulation requirements to meet the global need for a circular economy.



Group company, with a view to collaborating with European automotive manufacturers and others. Going forward, JXCSE will augment our efforts, promoting these as comprehensive action including new material development.

In Japan, JX Metals Circular Solutions Co., Ltd. started operation in October 2021 to promote the development of technologies for closed-loop recycling.



JX Metals Circular Solutions Co., Ltd.

Strengthening our Organizational Structure for LiB Recycling

In August 2021, we established the Battery Material & Recycling Promotion Office, a result of integrating the LiB Recycling Project Office within the Advanced Technology & Strategy Department, Technology Group with the Thin Film Materials Division's general operations related to the development of all solid-state battery materials. In addition, we transferred the all solid-state battery materials development work being conducted at the Isohara Works Product Development Center to the Technology Development Center, establishing the Battery Materials Group there.

We have been developing recycling technologies to realize LiB closed-loop recycling, and at the same time, we have been developing technologies for materials to be used in all solid-state batteries, expected to dominate the next generation of battery technology. With this organizational change, we have established a system to promote LiB recycling and material development in a unified manner. We will accelerate commercialization through this consolidation of internal battery-related resources, which also offers synergies such as improving the quality of recycled materials by leveraging our materials development technology and developing technologies with a view to the entire supply chain. In the future, the Battery Material and Recycling Promotion Office will play a central role in the Group's efforts to realize automotive LiB recycling in cooperation with domestic and overseas sites.

Establishing New LiB Recycling Companies in Japan and Overseas

In August 2021, we established a new company, JX Metals Circular Solutions Europe GmbH (JXCSE), in Frankfurt, Germany. This company's aim is to promote our EoL LiBs recycling and battery materials businesses. In Europe, a draft battery regulation was released in December 2020, part of growing discussions on battery recycling in conjunction with the widespread adoption of EVs. We have been working on the commercialization of LiB recycling through TANIJOBIS, our Germany-based

Participating in a Consortium to Develop LiB Recycling Technology in Germany

Group company TANIJOBIS participates in HVBatCycle, a consortium for joint research and development on the recovery and reuse of LiB materials. In Germany, the Volkswagen Group has been leading a joint research and development effort with industry and academic institutions such as RWTH Aachen University and the Fraunhofer Institution for the closed-loop recycling of cathode materials, electrolytes, and graphite, which are the components that make up batteries. The consortium has now been formed as an extension of these efforts with the support of the German Federal Ministry for Economic Affairs and Climate Action.

In this consortium, we will newly establish a hydrometallurgy process R&D facility in the town of Goslar, the home of TANIJOBIS's main site, based on the technologies developed by the Group. Here, we will work with project partners to optimize this process to recover high-quality battery materials in high yield using battery powder provided by Volkswagen. In Europe, where industry-government-academia efforts to expand the use of EVs are booming, we will take further steps toward the social implementation of automotive LiB recycling.

Harnessing Green Loans to Build an Automotive LiB Recycling Facility in Germany

In April 2022, JXCSE entered into an agreement with Mizuho Bank, Ltd. for the formation of a green loan. A green loan is a loan made in accordance with the Green Loan Principles, which are international guidelines for financing, to finance projects that contribute to solving and mitigating environmental problems. This green loan is to be used to invest in R&D facilities for the recycling of spent automotive LiB in Germany.

Selected as a NEDO Green Innovation Project

The Green Innovation Fund operated by the New Energy and Industrial Technology Development Organization (NEDO) was established to create a virtuous circle between the economy and the environment as part of the Green Growth Strategy for carbon neutrality in 2050. The fund aims to provide long-term, continuous support for initiatives by corporations and other organizations, from research and development and demonstration to social implementation.

The JX Nippon Mining & Metals Group proposed the Recycling of Automotive LiBs through Closed-Loop Recycling project, which was selected as a fund project in May 2022. We will take this opportunity to more actively promote developing technologies toward effective use of precious metal resources.

Strengthening the Functions of our Recycling Center in Taiwan

Group company Nikko Metals Taiwan Co., Ltd.'s Changpin Recycle Center has increased its collection and processing capacity by 2.4 times, from 500 to 1,200 tons per month, by adding a new building and additional recycling equipment in order to increase its capacity for handling recycled raw materials. This new equipment began operation in April 2021.

Taiwan has clusters of cutting-edge electronics industries and a well-developed collection system for waste electrical and electronic equipment. It is expected to continue to generate increasing amounts of recycled raw materials going forward. In Taiwan, we will utilize the rapid and accurate analysis and evaluation technologies we have cultivated so far to increase the collection of raw materials.



New crusher and automatic sampling equipment

Launching Operations at the Oita Recycling Logistics Center

At the Saganoseki Smelter & Refinery of JX Metals Smelting Co., Ltd., we newly established the Oita Recycling Logistics Center in the Oita Port Ozai Nishi-ku area of Oita City, Oita Prefecture. This center launched operations in October 2021. The Saganoseki Smelter & Refinery, which aims to strengthen its business by pursuing an optimal mix of copper concentrates and recycled raw materials, has positioned the center as a collection site for recycled raw materials. Harnessing this center as a central driver in recycling mineral resources, including copper and minor metals, we are working to enhance functionality by efficiently analyzing raw materials, installing a storage building and a raw material compressor to improve transportation efficiency, and taking other measures.

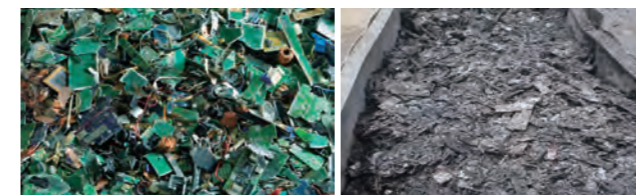


Opening ceremony held in September 2021

Launching Operations of a Large-Scale Pre-Treatment Calcining Furnace (Kiln)

Recycled raw materials contain a large amount of combustible materials such as resin substrates and housing plastic. If these materials are treated as-is in the copper smelting process, the violent combustion causes an increase in exhaust gas emissions, destabilizing operations. Therefore, more advanced pre-treatment technologies and facilities are needed to efficiently smelt a greater number of recycled raw materials.

At the Saganoseki Smelter & Refinery, we added a large pre-treatment calcining furnace (kiln), which launched operations in April 2022. This has made it possible to efficiently remove resins and other materials adhering to the recycled raw materials, and increase pre-treatment capacity by 50% over previous levels to just under 10,000 tons per month.

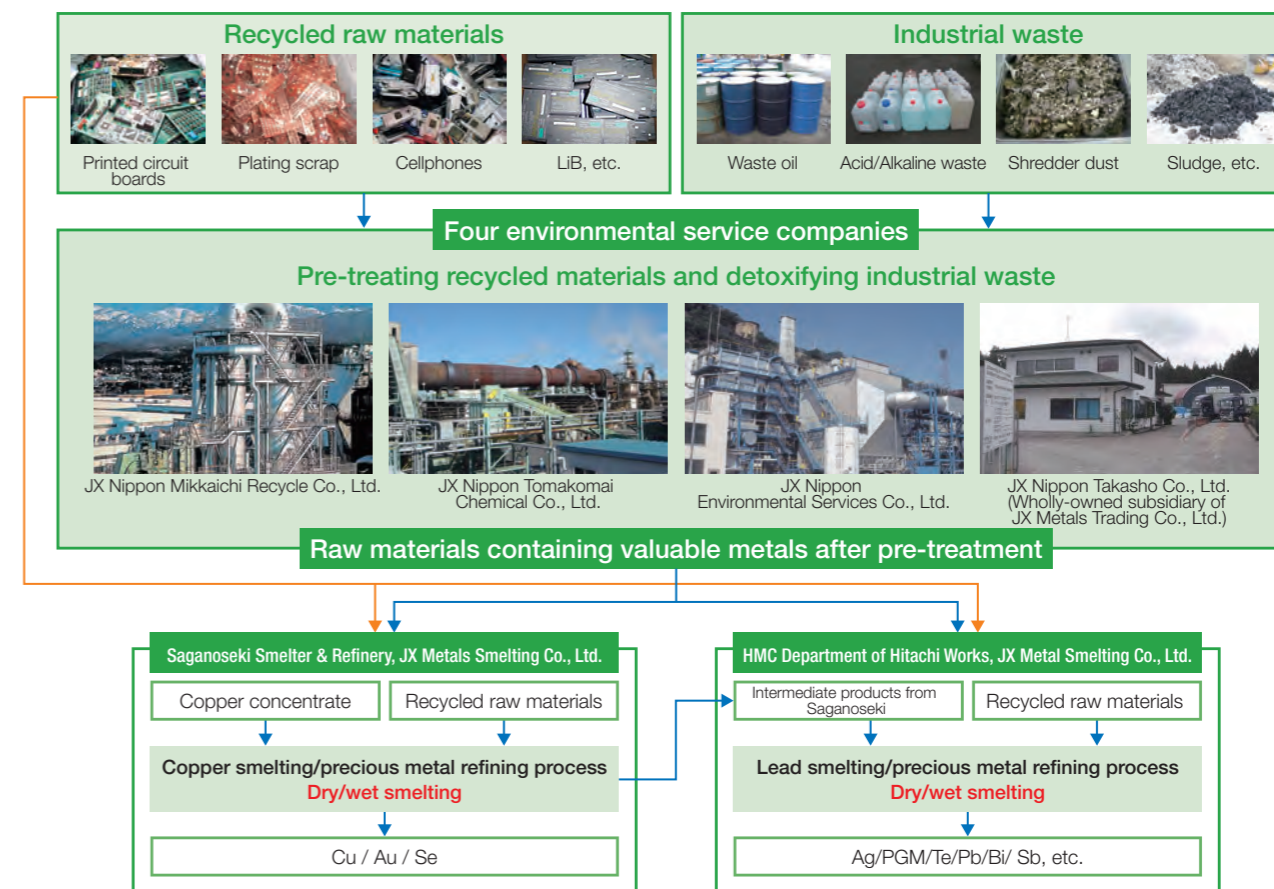


Before and after incineration of recycled raw materials

Initiatives for Zero Emissions

The Group's Smelting, Refining, and Recycling Business aims to recycle valuable metals such as copper and precious metals contained in scrap produced by factories and in used electrical and electronic equipment generated in daily life, etc. Here, environment-related Group companies work in unison to realize a recycling-oriented society.

On industrial waste disposal, secondary waste such as incinerator ash and residue is often generated, much of which is landfilled at final disposal sites. In the Group's Recycling and Environmental Services Business, we have established a recycling system under the slogan "never discard, never bury" and pursue industrial waste treatment and non-ferrous metal recycling with zero emissions so that this secondary waste is also recycled.



Conservation of Biodiversity

The Group recognizes that biodiversity conservation is an important management issue. Mining operations in particular are strongly linked to local ecosystems and require due care, which is why we are implementing a variety of initiatives in Japan and overseas.

Activities at the Caserones Copper Mine

At the Caserones Copper Mine, 48,200 seedlings from 15 native flora species are being planted in an area spanning 1.43 square kilometers to protect biodiversity. The areas where these are being planted are Ramadilla on the mine site and around the off-site areas of Maitencillo and Amolanas. In addition to reforestation, we are monitoring the development of plants native to the area and conducting research on the impact of climate and other factors on the propagation and distribution of plants native to the high altitudes around the Caserones Copper Mine. In 2021, 6,000 new seedlings were planted, with total of 24,500 planted in an area of 0.98 square kilometers so far.



Plants native to the Caserones Copper Mine area

Forest Maintenance Activities in Japan

The Group has been promoting reforestation activities throughout Japan, especially at the sites of closed mines. Employees and their families participate in these activities to communicate the importance of protecting the local environment through contact with nature.

Activities in Japan



Formulating Mine Closure Plans

The Group believes that it is important to minimize the impact on the environment and society in the surrounding areas when closing a mine. Overseas, we have formulated a mine closure plan for the Caserones Copper Mine through dialogue with the

relevant authorities, local communities, and other stakeholders, and have made financial and other preparations to implement the necessary measures, thereby ensuring appropriate responses in the event of its closure.

Column

Closed Mine Initiatives

From its founding in 1905, the JX Nippon Mining & Metals Group has been engaged in mining operations across Japan. By ensuring a steady supply of nonferrous metals and other resources, we contributed to Japan's economic growth. In Japan, however, operations have ceased in nearly all mines as their mineral resources have dried up. Still, in closed mines we provide acid mine drainage (AMD) treatment and work to maintain and preserve the natural environment.

* Currently, the Kasuga Mine (Kagoshima Prefecture) is the Group's only operational mine in Japan

Management Operations at Closed Mines

JX Nippon Mining Ecomanagement, Inc. oversees the closed mines managed by the Company. The work mainly consists of detoxifying acid mine drainage (AMD) and maintaining and preserving the tailings dams and galleries of the mining sites.

AMD occurs when rainwater or other water comes into contact with materials such as copper concentrates remaining after the mine is closed or the rubble and slag of tailings dams. Since AMD contains metals and is highly acidic, treatment facilities have to operate 365 days a year.

As for tailings dams, construction is underway to handle the recent flooding in areas of frequent rainfall, and to adapt to large earthquakes. Through the management of these closed mines, we are striving to preserve the natural environment.



(Upper left) Installation of a new catchment basin at Mitate Mine
(Upper right) Site improvements at the stone tailings dams at Toyoha Mine
(Lower right) Autumn leaves around Toyoha Mine

Construction Work at Tailings Dams Against Earthquakes and Flooding

The Great East Japan Earthquake that occurred in March 2011 damaged the tailings dams at both the Oya Mine and Takatama Mine. The seismic resistance of both sites met the construction standards effective at the time of the earthquake, and should have been able to withstand a Level 1 earthquake, which is the earthquake level anticipated by the government. However, the earthquake damaged these sites because its extent far exceeded the earthquake resistance standards anticipated to be needed by the government. After reflecting on this incident, we organized a committee of experts (scholars and specialists) to review the seismic standards of the tailings dams. As a result, we voluntarily established a standard that our sites have seismic resistance capable of withstanding a Level 2 earthquake.* At the same time, we have established strict voluntary standards for stability against flooding that has occurred in several areas over

the past few years, caused by climate change.

We used these voluntary standards for seismic resistance and heavy rainfall in risk assessments conducted for all 51 tailings dams in Japan. For those tailings dams determined to require countermeasures, we established priorities and have been carrying out construction work against potential damage since fiscal 2013, with plans to complete all countermeasure construction by fiscal 2024. This construction work includes ground improvement (to ensure seismic stability) and channel augmentation (to ensure drainage capacity during floods).



Countermeasure construction: Installation of check dams (driftwood stopper)
Countermeasure construction: Upgrading drainage channels

* The maximum intensity of seismic vibrations that can be expected to occur in the target region at present and in the future. Subsequently, the government's earthquake resistance standards were changed to levels similar to our voluntary standards.

TOPICS

Initiatives at Hitachi Works

The city of Hitachi is the Group's place of origin. Approximately 500 Oshima cherries and wild cherries planted in the early days by Hitachi Mine are growing on Mt. Kurakake, next to our Hitachi Works. Since 2008, the Mt. Kurakake Cherry Centennial Committee of Hitachi City has sponsored activities to protect these trees and create a place of rest and relaxation for the local community, as well as a place for environmental education of the children of the future. In fiscal 2021, we once again were forced to cancel forest maintenance activities to help prevent the spread of COVID-19. Activities are scheduled to resume in fiscal 2022, to be implemented in November 2022.



Forest maintenance activities

Other Initiatives for Environmental Conservation

Conservation of Water Resources

In the Group's business activities, we use large quantities of water in our copper mining operations, as well as for cooling water (mainly seawater) used in smelters. We recognize that water resources are not only essential for our Group's business activities, but also important resources for the local communities where our production sites are located. With this in mind, we are doing our best to make sure that these sites make effective use of water resources by properly monitoring water consumption and exploring methods for reduced use or reuse.

One example comes from the Caserones Copper Mine in Chile, a mine where we have operations. Here, we have set limits on water use that are stricter than those set by the local authorities, and we monitor the balance of water intake and discharge. In areas downstream from the mine, we desalinate seawater, providing water supplies used by local residents for agriculture and general home use.

Water Risk Assessments at In-house Plants

The Group assesses and confirms how water risks, such as water shortages, water pollution, and flooding associated with climate change, affect each of the Group's production sites and its supply chain. We use Aqueduct, a water risk assessment tool provided by the World Resources Institute (WRI), to identify what water risks are present. In fiscal 2021, we assessed six of our main production sites in Japan. None of the sites were found to have high water risk in the assessment.

Proper Management of Chemical Substances

The Group has voluntarily established chemical substance management standards, and we strive to mitigate the harmfulness of these substances by controlling their use. In addition, the Green Procurement Guidelines clearly identify substances that must not be included in manufacturing processes, materials, or equipment, and we ensure our suppliers are aware of these. Furthermore, we strive to provide safety information to our customers and all other product stakeholders.

Detoxification Treatment of Equipment Containing PCBs*

The Group contributes to environmental conservation by detoxifying hazardous waste through our treatment businesses for low-concentration PCBs and asbestos. In 2014, JX Nippon Tomakomai Chemical Co., Ltd. became the first firm in Hokkaido to receive certification from the Minister of the Environment as a detoxification facility for treating low-concentration PCB waste. In addition, JX Nippon Environmental Services Co., Ltd. is engaged in the melting and detoxification of asbestos. The company treated approximately 3,409 tons of waste asbestos in fiscal 2021.

We are also proceeding with treatment of Group-owned equipment with high-concentration PCBs at the Japan Environmental Storage & Safety Corporation (JESCO). We have completed treatment of this equipment at sites outside the Tokyo metropolitan area, and plan to complete treatment at sites in the Tokyo metropolitan area by the disposal deadline. In addition, we are planning disposal of equipment with low-concentration PCBs through licensed low-concentration PCB treatment contractors such as JX Nippon Tomakomai Chemical Co., Ltd.; this disposal is scheduled to be completed by fiscal 2024, two years before the disposal deadline.

* Polychlorinated biphenyls (PCBs): Substances that were often found in insulating oils for transformers and capacitors, as well as in pressure-sensitive photocopiers, due to their excellent electrical insulating properties. However, their toxicity has now led to a ban on their new manufacture and import.



Rotary kiln incinerator at JX Nippon Tomakomai Chemical Co., Ltd.

Environmental Management

JX Nippon Mining & Metals Group Basic Environmental Policy

As a comprehensive manufacturer of nonferrous metals and advanced materials, the JX Nippon Mining & Metals Group is rising to the challenge of innovation in the productivity of resources and materials. Committed to compliance with environmental regulations, we carry out the following initiatives in order to proactively strive for environmental conservation on a global scale, including measures against global warming, and contribute to building a sustainable society.

1. We will contribute to achieving a decarbonized society by promoting technological innovation and energy transition and aiming for zero greenhouse gas emissions.
2. We will supply environmentally-friendly advanced materials to support the growth and advancement of society.
3. We will promote resource recycling and aim for zero emissions in all our business activities.
4. We will thoroughly raise each employee's awareness of environmental conservation through environmental education, leading to business activities with less environmental impact.
5. We will share information on environmental conservation activities with stakeholders and seek to operate in harmony with society.

Compliance with Environmental Laws and Regulations

Through steady operation of environmental management systems, the Group works to ensure compliance with environmental laws and regulations. The Environment & Safety Department at the Head Office monitors and supervises the state of compliance and reports to the ESG Committee through the Safety and Environment Committee. At their annual meeting, environmental management supervisors work to strengthen our compliance system by providing information on legal and regulatory trend sand reporting on the status of compliance at each operating site. We additionally reinforce employees' knowledge of laws and regulations by holding rank-specific education and training regularly at the Head Office and operating sites.

In fiscal 2021, there were no adverse dispositions from regulatory authorities (including license revocation, orders to cease operations, orders to cease use of facilities, orders for improvement, fines, etc.) for violations of environmental laws and regulations.

Establishing an Environmental Management System

The JX Nippon Mining & Metals Group has established environmental management systems in line with ISO 14001 standards for ensuring achievement of the Action Plan for Environmental Protection, which was drawn up to reflect the Basic Environmental Policy. A multilevel organizational structure has been created, including various committees and subcommittees, in which everyone, from senior management headed by the president to employees at operating sites and affiliated companies, works together to promote environmental conservation and mitigate environmental risk. No environmental accidents occurred in the Group in fiscal 2021.

Operating Sites That Have Obtained ISO 14001 Certification (as of March 31, 2022) **41 Operating Sites** (Japan: 29, overseas: 12)

Environmental & Safety Auditing

Individual operating sites implement internal environmental audits at least once a year. In addition, they periodically undergo environmental and safety audits by the Environment & Safety Department of the Head Office. Audits were conducted at 20 sites in fiscal 2021.

Activities in the areas of health and safety and environmental conservation are planned, promoted, and reviewed by the Safety and Environment Committee, an organization under the ESG Committee. The Safety and Environment Committee meets once every six months.



An environmental & safety audit at Isohara Works

Promoting CSR Purchasing

The Group has set a Green Purchasing Policy, aimed at reducing environmental and other social impacts when procuring materials and equipment. Based on this policy, we have drawn up Green Purchasing Guidelines setting out specific requirements for choosing suppliers. This Guideline contains "mandatory conditions (minimum requirements)" for mandatory compliance, and "preferred conditions (preferences)" that we ask our business partners to consider. These conditions are applied to all of our suppliers. Supplier compliance with these guidelines is checked in our CSR Procurement Questionnaire survey.

Special Feature 3

Further Accelerating our Digital Transformation (DX) Strategy

Since 2017, the JX Nippon Mining & Metals Group has been promoting the IoT 5+1 Year Plan with the aim of establishing a business foundation to realize our ideal state of being a technology-based company, as envisioned in our 2040 Long-Term Vision. We are working to utilize IoT and AI to improve productivity and quality, evolve preventive maintenance, improve safety, and reduce environmental impact in all areas of our business.

Reference → The JX Nippon Mining & Metals Group Long-Term Vision 2040 ⇒ Page 11

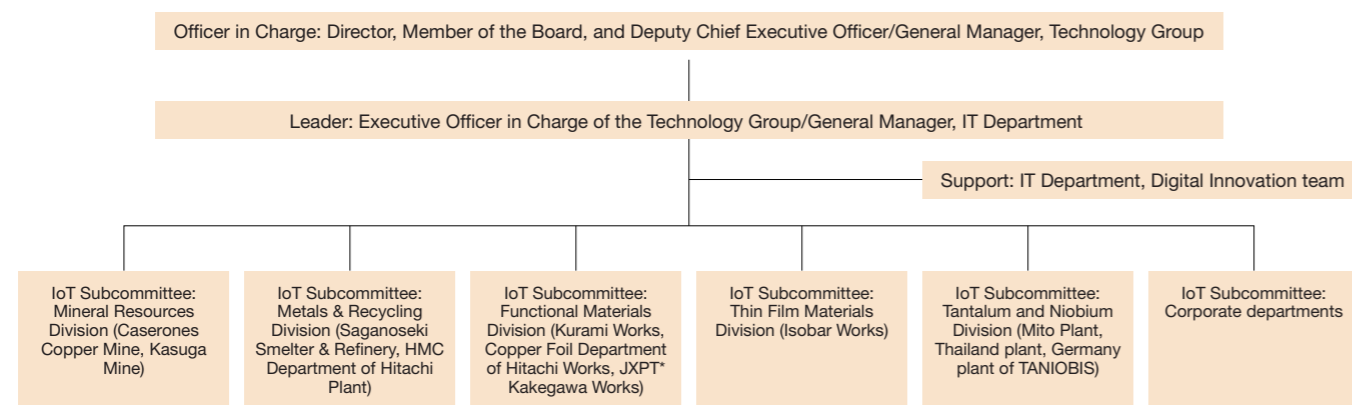
Envisioning an ideal state and driving process innovation in all areas of our business

Nonferrous metal materials, comprising core products for the Group, require constant creation and innovation in response to changes in society, industry, and technology. The Group must keep up with the pace of these changes and continue to innovate its own processes. To do so, it is essential to introduce and implement cutting-edge digital technology, and we must execute our plans by closely sharing awareness of the issues at hand with people in the field, who are the primary drivers of innovation.

In the IoT 5+1 Year Plan, the Technology Group has been established as the controlling organization, and the IoT Subcommittee established within each division leads measures, with the IT Department's Digital Innovation team serving as the promotion

secretariat and providing technical support. Each measure was to automate processes (reductions in costs, lead-times, etc.) by introducing IoT and AI technologies, and to digitize analog information (paper documents, forms, etc.) regarding processes, and to stock this information across all businesses. In doing so, we have also been working on new technologies in the pre-practical stage in verification tests. In addition, we are also engaged in verification tests of highly promising elemental technologies, such as technology for optimization calculations using quantum annealing computers, and topographical change and landslide monitoring using satellite-based SAR survey technology.

DX Strategy and Promotion System



* JX Metals Precision Technology Co., Ltd.

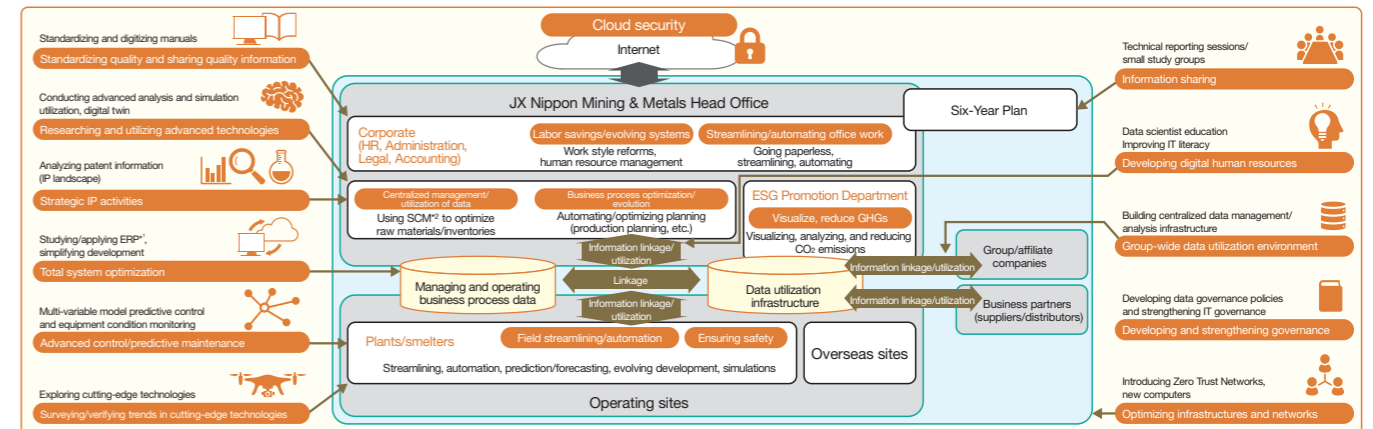
Aiming to create a digital twin value chain unique to the JX Nippon Mining & Metals Group

The measures promoted under the IoT 5+1 Year Plan have resulted in approximately 120 demonstration tests. Several of these have been converted to practical application and we are currently establishing databases in related departments. In fiscal 2021, we began formulating the IoT/AI Six-Year Plan (2023 - 2028) to further deepen and accelerate DX.

In this plan, new issues have been identified in light of changes in the business environment, and its new measures include

attempting to utilize collected data as feedback in manufacturing processes, solving issues in sales and logistics domains, and introducing IoT technology for the purpose of decarbonization. In addition, we aim to promote DX throughout the supply chain to create value for our customers and more proactively utilize digital technology to address the issues of securing and training human resources and addressing work styles.

JX Nippon Mining & Metals' Six-Year Plan and Technology Initiatives to Support DX



Activities that had been conducted by subcommittees have been restructured for total optimization. In the six years through 2028, we will develop an infrastructure base for data integration using the new network, and will also utilize the digital twin model, leading to a new value chain.
 *1 Enterprise Resource Planning
 *2 Supply Chain Management

DX in Base Businesses (Mineral resources, Smelting, Recycling)

Installing Automatic Control Systems at Copper Concentrates Processing Plants

Caserones Copper Mine

At the Caserones Copper Mine in Chile, we are engaged in a wide range of initiatives to introduce advanced technologies, with a focus on IoT. This includes condition monitoring for mining heavy equipment and ore filtering-related equipment (data collection and reporting), early detection of problems by installing cameras, and evolving machinery operation control.

By building a system that makes use of the ideas of the highly-talented staff on the Chilean side, and by ensuring strong teamwork with engineers seconded from Japan, we aim to further improve the performance of the copper concentrates processing plant and further stabilize operations. We are also



Copper concentrates processing plant at the Caserones Copper Mine

working to adopt and roll out these success stories to other sites, such as the Saganoseki Smelter & Refinery.



Strengthening Supply Chain Management (SCM) for Green Hybrid Smelting

Saganoseki Smelter & Refinery, JX Metals Smelting Co., Ltd.

The JX Nippon Mining & Metals Group aims to establish hybrid smelting technology that significantly increases the ratio of recycled raw materials by leveraging its accumulated strengths in material recycling technologies. In order to cope with the increase in the amount of recycled raw materials collected, we are improving the efficiency and strengthening the management of the series of processes from raw material procurement to operation. By establishing a system that aggregates data on raw

materials and each process and provides feedback with the necessary information, we will pursue total optimization and improve productivity by collecting raw materials in a timely manner and improving the accuracy of production forecasts. Furthermore, in order to realize our Sustainable Copper Vision, we will continue to strive toward the percentage of recycled raw materials (input ratio of raw materials or content ratio in products) to 50% or more by 2040.



Saganoseki Smelter & Refinery (Oita Prefecture)



A converter furnace at the Saganoseki Smelter & Refinery

DX in Focus Businesses (Advanced Materials)

Developing Image- Based Inspection Technology for Micro-Connector Injection Molding Processes

Nasu Works, JX Metals Precision Technology Co., Ltd.

We are working to automate production processes for advanced materials at the Nasu Works through the use of image processing technology. In the inspection process of micro-connectors and other precision components, defective products are sorted and identified in detail based on multiple images. Since it is important to capture images that enable precise and stable identification of the subject during image analysis, we conducted a series of tests of the image capture environment and methods by installing numerous cameras at various positions and angles in the actual process.

For one product (an electronic component about 1.5 mm long), we developed a device that can capture 34 close-up images with 10 cameras for each item. The resulting images are processed to determine whether the item passes inspection or

not. This enables mid-process determination and removal of defects such as surface chipping and irregularities that could not be detected until visual inspection in the final process. In addition to reducing manpower and increasing efficiency in inspections, feedback on defective products has become faster, and process improvements have not only reduced the defect rate itself, but are also being used to analyze defect factors that were previously unknown.

Illustration of inspection system



Production line at Nasu Works

Impact of DX Promotion
Implementing the new inspection system
improves defect rate:
23.1% ▶ 2.9%

Reducing Target Defect Rates by Utilizing Data, Automating with Image Analysis and Introduction of Arm Robots

Thin Film Materials Division, Isohara Works

In the process of manufacturing semi-finished sputtering targets from raw powder, the relationship between raw powder conditions and the occurrence of defects is analyzed and provided as feedback to the manufacturing department to reduce the defect rate. In the process of shaping semi-finished sputtering targets, pressure is applied to these semi-finished products. Traditionally, these semi-finished products weighing several tens of kilograms had to be manually set on the shaping equipment, a task that was extremely burdensome for operators. Therefore, by using image analysis to determine the shape of deformed semi-finished products, we calculated the appropriate processing method and combined this with an arm robot to automate the setting process. This not only reduced operator workload

and improved work safety, but also enabled unmanned operation, contributing to increased productivity.



Automated inspection system utilizing an arm robot

DX in R&D

Exploring New Materials with Advanced Computational Science Harnessing Deep Learning

Simulation Team, Advanced Technology & Strategy Department, Technology Development Center

Our R&D units use molecular simulation software, a cutting-edge deep learning technology that accelerates quantum chemical calculations, as well as materials informatics technology to explore new materials in the areas of copper alloys, ceramics solid-electrolytes, and more. The simulation team conducts interviews with the Material Development Group and customizes

algorithms for each material topic to aid in research and prediction of new materials.



A simulation in progress

Building a Digital Twin Infrastructure Applicable from Development to Manufacturing

The JX Nippon Mining & Metals Group will actively incorporate cutting-edge real-time simulation technologies and artificial intelligence methods to utilize a variety of simulations not only in material exploration, but also in design and manufacturing pro-

cesses. By doing so, we aim to build a digital twin infrastructure that can be applied from R&D to manufacturing, sales, and even to the customer's premises in the future.

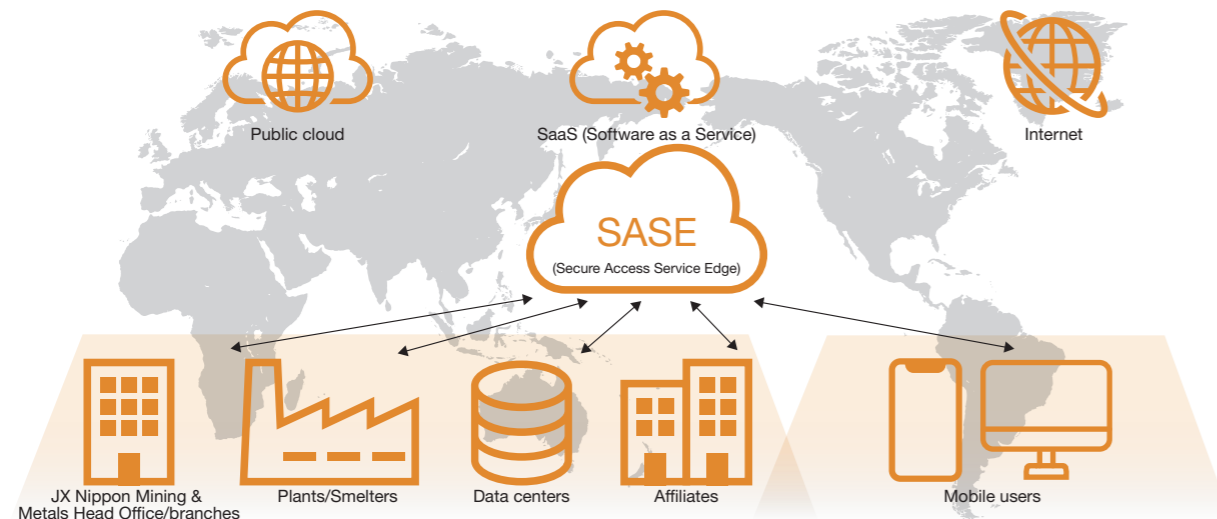
Strengthening DX Infrastructure

Implementing a New IT Infrastructure Based on the Zero Trust Approach

In response to changes in work styles amid the COVID-19 pandemic and requests from business partners to strengthen security measures, the Group has been upgrading its own network based on the concept of zero trust. This is the most advanced cloud-based security service available today, enabling security management at the terminal and user level that cannot be

achieved with conventional perimeter security networks, thereby raising the security level of the entire Group in a uniform manner. This system is already in operation at JX Nippon Mining & Metals' Head Office and operating sites, and will be rolled out to Group companies in Japan and overseas in stages.

Next-Generation IT Infrastructure Using a Zero Trust Model



Enhancing DX Human Resources and Strengthen Training

Beginning in fiscal 2019, we have been working to enhance our digital resources and strengthen their training. In data scientist education, we have expanded our training programs according to the level of each employee, such as beginner programs for young employees and intermediate programs for mid-career employees. We also launched follow-up education via e-learning in fiscal 2021, and plan to start literacy education for all employ-

ees in fiscal 2022.

We are also working to improve the level of our DX education by strengthening cooperation with educational institutions, such as joint research with Tohoku University and dispatching employees to the Shiga University Graduate School of Data Science.

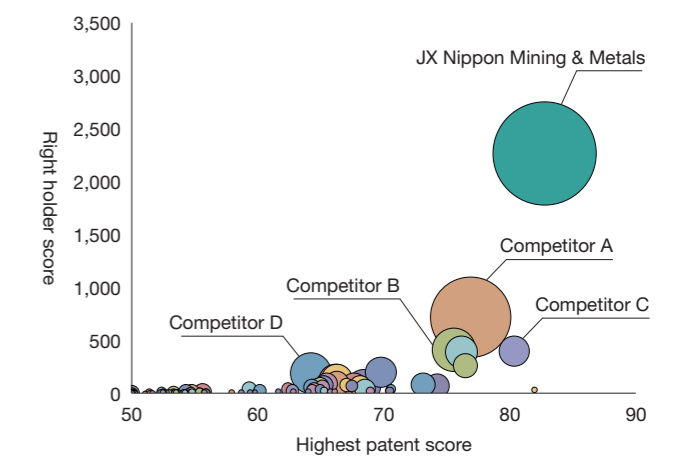
Promoting Strategic IP Activities

The Group regards patent information as big data useful for understanding technological trends, and utilizes it not only for the purpose of preventing infringement and determining patentability, but also for various other purposes. For example, by combining IP information from our Group and others with business and market information, we conduct research and analysis (IP landscape) to anticipate changes in customer needs and technology trends, and contribute to the creation of development themes and the search for partners. In fiscal 2021, we held workshops to promote internal IP landscape activities, creating a mock IP landscape with IP and marketing personnel.



A workshop in progress

Our Patent Analyses



* Drafted by JX Nippon Mining & Metals based on data from the Biz Cruncher® website by Patent Result Co., Ltd.

Message From the Officer in Charge

In the next IoT/AI Six-Year Plan, we will develop measures aimed at total optimization instead of individual optimization.

The reason why our Group was quick to take the helm in promoting DX in all areas throughout the organization was a clear sense of urgency. We believe that, in order to respond to rapid changes in the business environment, it is essential to utilize cutting-edge digital technology, and unless we start working on this at an early stage, even at the risk of failure, it will be impossible to remain a leader in the non-ferrous metals industry.

The members of the subcommittees for each division have played a central role in supporting the introduction of new technologies in close cooperation with field engineers at each plant. However, we believe that the introduction of a system for advancing demonstration tests so that we can actively tackle entirely new technologies has led to significant results. Although some of the 120 demonstration tests conducted over a period of five years, did not result in practical application, I believe that a positive mindset was fostered among field stakeholders toward investigating the causes of these failures and applying their findings in future action. This, I believe, has helped a culture of challenge without fear of failure take root throughout the Group.

In the past, planning has focused on bottom-up, plant-by-plant, individual optimization activities. However, as we have worked to automate and streamline, analog data is being replaced by digital data, and we have been solidifying an infrastructure for aggregating information. In the IoT/AI Six-Year Plan to begin in fiscal 2023, we will think beyond the boundaries between plants and operating sites for each business and develop measures aimed at total optimization, with a primary focus on data utilization throughout the supply chain.

Copper, a mainstay product for the Group, is an indispensable material for promoting DX in society, and we must meet the demands of our customers and the market as a technology-based company. We intend to further accelerate the Group's DX strategy and quickly establish a rapid technology development system and a highly efficient profit structure.



JX Nippon Mining & Metals Corporation
Executive Officer, General Manager, IT
Department Technology Group
Senior Executive Engineer, Administration Department
Ebihara Hiroyuki



Social

Materiality 2 Provide Advanced Materials That Support Lives and Lifestyles

The excellent properties of the major base metal of copper and a variety of minor and precious metals have supported the evolution of electronic devices. The JX Nippon Mining & Metals Group continues to pursue technical rationality and efficiency, as well as make improvements in product quality and properties of these materials, so we can rapidly offer society products and technologies supporting the coming data society and IoT/AI society.

Developing Advanced Materials  ▶ P62	Promoting Open Innovation  ▶ P64	Building a Development Framework and Fostering Development Personnel  ▶ P67	Efforts to Cultivate the Next Generation  ▶ P69
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KPIs and Progress

Assessment: 😊 Achieved/Steady Progress ☹️ Not Achieved

KPI	Fiscal 2021 Results/Progress	Assessment
Develop advanced materials needed by the IoT/AI society	In order to capture growing demand, we have announced a series of production capacity expansion plans, including the construction of new plants and site acquisition, as well as measures to strengthen our supply chain. Continuing from the previous fiscal year, we have promoted open innovation through collaboration with companies and universities to develop advanced materials needed by the IoT/AI society.	😊
Build a framework to support technology-based management	With the goal of continuously generating innovative technologies and products for technology-based management, we have built a framework for development and worked to foster development personnel to generate new innovations and diversify human resources.	😊

Developing Advanced Materials

In order to contribute to the development of a sustainable society, the Group relentlessly pursues innovation by advancing and utilizing core technologies accumulated to date, and through co-creation with outside resources.

WEB JX Nippon Mining & Metals' Core Technologies
https://www.jx-nmm.com/english/rd_sp/core_tech/



Two New Plants in Hitachi City Expanding Production Capacity of Advanced Materials

The balance of supply and demand for advanced materials such as sputtering targets for semiconductors and treated rolled copper foil has been tight in recent years, making it an urgent issue to build a supply system that can fulfill strong market demand. Under these circumstances, we have decided to construct two new plants in Hitachi City, Ibaraki Prefecture, to expand our production capacity of advanced materials.

This will increase our capacity for sputtering targets for semiconductors by a total of 32 billion yen, or approximately 80% versus fiscal year 2020. In addition to strengthening existing sites, we plan to invest approximately 14 billion yen to construct a new plant in the HITACHI HOKUBU Industrial Park to handle melting and rolling processes.

For treated rolled copper foil, we plan to establish a new plant in the Shirogane district, to be part of the Hitachi Works, with a total cost of 16 billion yen. Until now, the Hitachi Works has been handling surface treatment as the final process. With the production line for the rolling process also being installed in the new plant, production capacity will increase by approximately 25% versus fiscal year 2020.



Rendering of the New Hitachi-kita Factory (tentative name) (scheduled to start operation in the second half of fiscal 2023)



Image of the New Hitachi Factory (tentative name) (scheduled to start operation in the first half of fiscal 2024)

Acquisition of a Building Site for Expansion of Production Capacity in Arizona, U.S.

Accelerated moves towards digital transformation and decarbonization are currently driving rapid expansion in the semiconductor industry. As part of the trend, leading semiconductor manufacturers, among the Company's major customers, are planning successive investments in the United States. The Company had already established JX Nippon Mining & Metals USA, Inc. in Arizona, which is a U.S. semiconductor industry hub, and it is necessary to expand production capacity further to fulfill customer needs.

Therefore, in March 2022 we acquired approximately 260,000 m² of land, roughly six times the area of the existing site, in Arizona. Construction of a new sputtering target plant is planned to begin in the second half of fiscal year 2022, with operations to commence in fiscal year 2024 or onward. As a result, production capacity in the U.S. is expected to increase by 2.5 times, compared to the previous capacity. We will also utilize the site not only as a base for production of sputtering targets for semiconductors, but also as a site for new business development, and we aim to make it the center of our business in the advanced materials field in the US.



Rendering of the new base



Strengthening the Tantalum Target Business Supply Chain

In April 2022, the Company made tantalum and niobium smelter Tokyo Denkai Co., Ltd. into a wholly owned subsidiary. Tokyo Denkai was founded in 1950, and possesses outstanding technology and production capabilities in the fields of smelting high-melting-point metals. Today, its main business is producing ingots for tantalum sputtering targets, which are used as a protective material for semiconductor interconnects.

Tokyo Denkai procured high-purity tantalum powder from TANIOBIS, a Group company, and used it as raw material to smelt ingots, which were then sold to our Isohara Works. Since April 2021, we had invested in Tokyo Denkai together with Mercuria Investment Co., Ltd. and through this new acquisition of shares, we have further strengthened our partnership. We will further strengthen our supply chain in the tantalum sputtering target business and aim to create synergies with the JX Nippon Mining & Metals Group in the minor metal area in general, with a focus on niobium.

Established the Crystalline Material Business Promotion Office

It is anticipated that demand for compound semiconductor substrates used in optical devices and other high-functionality crystalline materials will grow in a variety of fields, including light receiving and emitting devices, which are essential amid the significant increase in data communications and the practical application of advanced sensing technology in the 6G era, and power semiconductors, critical for achieving a decarbonized society. Moreover, the Company has the advantage of technologies in the crystalline materials field such as high-purity refining, in which it excels.

Against this backdrop, in October 2021, we established the Crystalline Material Business Promotion Office within the Advanced Technology & Strategy Department, Technology Group in anticipation of future business expansion in this field. With this new organization that will be centrally responsible for supporting the planning and execution of expansion strategies for existing businesses and promoting the development of next-generation materials, we will aggressively promote the development of next-generation crystalline materials.



Compound semiconductor substrates (indium phosphide, cadmium zinc telluride)

Exhibited at the 8th Metal Japan (highly-functional metal expo)

We presented an exhibit at the 8th Highly-functional Metal Expo (Metal Japan) held at Makuhari Messe (Chiba Prefecture) from December 8 to 10, 2021. Our exhibit presented metallic and ceramic materials, including various high-performance copper alloys and various developed products, centered on a series of themes including metal powder for additive manufacturing and controlling heat. In addition, we once again prepared a special website, as in the previous year, to provide easy-to-understand information on products and technologies that could not be presented in panels.



At our exhibition booth

WEB Exhibition Special Website
<https://nmmjx-dc.com/en/>



Received the EPIC Distinguished Supplier Award from Intel Corporation

The award recognizes a consistent level of strong performance across all performance criteria. To qualify, suppliers must exceed expectations, meet aggressive performance goals, and score 80 percent or higher in performance assessments throughout the year. In 2022, only 26 suppliers in the Intel supply chain network earned this award.

“As one of only 26 Distinguished Supplier Award recipients across the Intel global supply chain, JX Nippon Mining & Metals Corporation has been crucial to Intel’s success while offering agility and flexibility during the ongoing volatile supply chain environment,” said Keyvan Esfarjani, EVP and Chief Global Operations Officer at Intel. “They have provided exceptional collaboration and commitment toward safety, quality, diversity & inclusion, and exceeded our expectations in support of Intel’s supply chain operational excellence. Earning this award speaks to their dedication to Intel values and their partnership.”

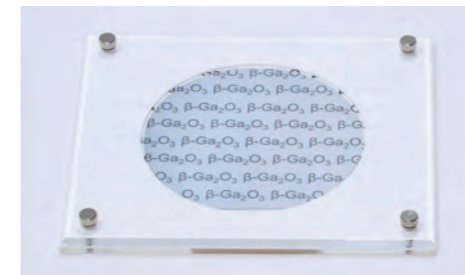
Promoting Open Innovation

We are promoting co-creation in a variety of formats, including collaboration with unique technologies held by Group companies, joint research with universities and other research institutions, and partnerships with external companies. These activities have the aim of building a system capable of generating new technologies and value.

Additional Investment in Novel Crystal Technology, Inc., a Developer of Gallium Oxide Crystals

Novel Crystal Technology, Inc. is a start-up engaged in development aimed at commercializing gallium oxide crystals, which are expected to be adopted in future generations of power semiconductor devices. The Company first took a capital stake in Novel Crystal Technology in June 2020, and has since collaborated in efforts such as development of raw materials. Novel Crystal Technology has made a new third-party allocation of shares aimed at procuring funds to augment its manufacturing capabilities with a view to product development of high voltage diodes scheduled for this year. The Company has taken part of this allocation and increased its stake in Novel Crystal Technology.

As a material for use in future generations of power semiconductor devices, gallium oxide will enable innovation in the design of power sources for electric vehicles and other applications and of electric power transmission systems, and is expected to contribute to effective energy use. The Company and Novel Crystal Technology will combine their technologies and knowledge to contribute to swift commercialization of this material.



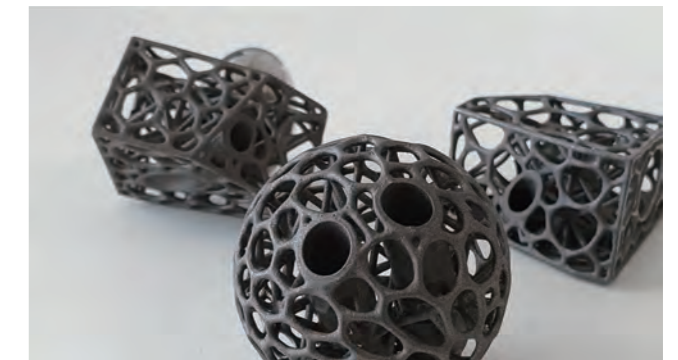
Gallium oxide 100mm epitaxial wafer/substrate

Alloyed Develops a Titanium Alloy Artificial Bone

U.K.-based Alloyed Limited, in which the Company has a stake, is a start-up from Oxford University whose business includes designing alloys and molds for metal additive manufacturing. As one application for metal additive manufacturing, Alloyed is developing medical implants (artificial bones) in cooperation with

the Company and Group member TANIOBIS.

Alloyed has now successfully designed and manufactured ankle joint implants using metal additive manufacturing, and the first surgery using these implants was performed in September 2021. Alloyed intends to increase the use of its ankle joint implants in the future, and will also expand development into the design of implants for other areas of the body to assist those suffering from bone cancer.



Ankle implants (artificial bones) designed and formed using metal additive manufacturing

Final Selection Carried Out for Accelerator Program

On March 29, 2022, the Company, in collaboration with France-based Agorize, conducted the final selection for the Innovation Challenge for the Next Generation 2021-2022 accelerator program, with the aim of creating new businesses. The program received a total of 65 proposals for a rich variety of ideas from start-ups and the academic community around the world. In carrying out the final selection of the seven companies shortlisted after interviews, we selected the top three companies based on evaluations from the perspectives of technology advancement, attractiveness of the business, and synergy with JX Nippon Mining & Metals Group’s business. In addition, the winner of the Audience Prize was selected by votes from Company employees. Going forward, we will explore the potential for a wide range of partnerships with the winning companies, including joint development, funding assistance, capital alliances, provision of materials, and provision of sales channels.

Selection Results for the Accelerator Program

Rank	Company name	Location	Business plan
Grand Prize	Additive Flow	United Kingdom	Multi-scale design optimization software for metal additive manufacturing
Runner-Up	PrintCB	Israel	Copper ink for printed electronics
Second Runner-Up	Outsense Inc.	Japan	Modeling new shapes of copper foil using automatic shape generation and simple analysis tools
Audience Prize			



The final selection meeting (held online)

Invested in an Israeli Battery Materials Development Company

In February 2022, we invested and took a stake in Addionics Limited, an Israeli company that develops smart 3D electrodes used in lithium-ion batteries. Addionics is a start-up developing 3D electrodes for lithium-ion batteries, and is using AI technology to develop 3D-shaped electrodes with porous structures. Compared to ordinary electrodes, 3D electrodes enable increased loading of active material, which improves energy density while reducing battery internal resistance. For this reason, they are expected to contribute to extended EV driving range, miniaturization of IoT devices, and reduced charging time.

The Company's investment will provide a springboard to build a stronger relationship with Addionics, and we will move forward with business development related to battery materials, while considering future collaboration with Addionics. We also believe that the investment will provide an opportunity to build networks with outstanding start-ups and academic institutions in Israel, which is a hub for tech companies. This will lead to generation of new business.

Established a Material and Technology Cooperative Research Laboratory with the National Institute of Advanced Industrial Science and Technology

In November 2021, we established the JX Metals-AIST Advanced Material and Technology for Future Society Cooperative Research Laboratory. By merging and further developing materials development technologies and manufacturing process technologies possessed by AIST and JX Metals, the Coopera-

tive Research Laboratory aims to achieve rapid practical deployment of materials for highly functional next-generation devices. To establish platform technologies for next-generation wireless telecommunications, research will target development of new manufacturing methods for flexible circuit boards, technologies for bonding copper foil and resin, and assessment of high-frequency conductivity of copper foil and materials bonding copper foil and resin. The laboratory will also go beyond these fields to develop materials and technologies in various domains relating to nonferrous metals.



JX Metals President Murayama Seiichi (left) and AIST President Ishimura Kazuhiko (right)

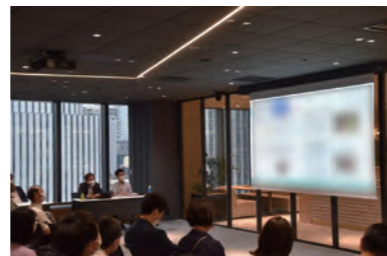
Invested in Venture Capital Fund

The Company decided to invest 500 million yen in the MIRAI SOZO 2 Limited Partnership venture capital fund managed by Innovations and Future Creation Inc. Innovations and Future Creation is a venture capital firm that works with the Tokyo Institute of Technology. As well as investing in start-ups at the seed stage*1 and early stage*2 in fields such as materials, chemicals, semiconductors, IoT, space, and robotics, the firm also provides management support to help start-ups to move to the next stage. To date the fund has invested in 31 companies, several of which are now publicly listed.

Traditionally, we have invested in and collaborated with start-ups mostly at the early stage. However, in order to further broaden the scope of our efforts, we decided to invest in venture capital funds. Through this investment, we will support the commercialization of outstanding research produced by the Tokyo Institute of Technology, and develop collaborations built on this research.

*1 Seed stage: Generally denotes a start-up around the time of its establishment, when it is solidifying the ideas and concepts of its business

*2 Early stage: Generally refers to a start-up that has passed the seed stage and entered the development stage



Exchange meeting with Innovations and Future Creation

Activities of the JX Metals Endowed Unit (Phase 2 to Phase 3)

Despite growing needs for a stable supply of nonferrous metal materials in recent years, the pool of researchers and engineers in Japan working in fields related to smelting, refining, and recycling nonferrous metals has been on the decline. In response to this situation, JX Nippon Mining & Metals, in collaboration with the Institute of Industrial Science, The University of Tokyo, launched the Endowed Research Unit for Nonferrous Metal Resource Recovery Engineering (JX Metals Endowed Unit) in 2012. The purpose of this organization is to develop new environmentally friendly recycling technologies for nonferrous metals while also developing the human resources responsible for the work in this field.

To prevent the spread of COVID-19, major activities in fiscal 2021 included symposiums held online, like in the previous year. These symposiums were attended by many people from Japan and abroad.

Against this backdrop, the unit began Phase 3 (five years) in January 2022. In Phase 3, we plan to further develop our activities to promote understanding and awareness of the importance and future of the nonferrous metals industry, as well as focus on activities for realizing the SDGs and for STEAM education* to nurture the next generation.

* STEAM education: An educational concept that combines the initial letters of five words: Science, Technology, Engineering, Art, and Mathematics. This concept aims to develop logical thinking and creative skills that lead to problem solving in the real world



At the press conference for the start of Phase 3
From left to right: Executive Officer Suwabe, Senior Executive Officer Tani, Project Professor Kurokawa, Project Professor Tokoro, Deputy Chief Executive Officer Sugawara, Director General and Project Professor Okabe, Project Professor Sugano, Project Lecturer Ouchi

Received 2022 Shokumon Award from The University of Tokyo

In recognition of these activities at the JX Metals Endowed Unit, we received the 2022 Shokumon Award* from the University of Tokyo. The University of Tokyo's Shokumon Award was established in 2002 to recognize individuals, corporations, and other organizations that have made major contributions to the growth of The University of Tokyo, either through volunteer work, or endowed courses and research centers. The award was given in recognition of our outstanding contributions to creating a center for research, exchange, and education that has attracted outstanding human resources and advanced information from all over the world for many years.

* Shokumon is the name of the castle gate in the capital of the ancient Chinese state Qi (now Shandong Province) during the nation's civil war era (403-221 B.C.). It is derived from a legend that the king of Qi treated scholars well, which led to the gathering of the wisest minds in the capital of Qi and the flourishing of academic activities.



Presentation of the Shokumon Award plaque (Prof. Fujii Teruo, President of the University of Tokyo (left) and President Murayama Seiichi, JX Nippon Mining & Metals (right))

Members (Fiscal 2021) * Positions and other information are as of fiscal 2021

- Project Professor** Okabe Toru H.
Director General, Institute of Industrial Science, The University of Tokyo
Professor, Integrated Research Center for Sustainable Energy and Materials, The University of Tokyo
- Project Professor** Tokoro Chiharu
Professor, Faculty of Science and Engineering, Waseda University
Professor, Graduate School of Engineering, The University of Tokyo
Project Professor, Institute of Industrial Science, The University of Tokyo
- Project Professor** Kurokawa Harumasa
Project Professor, Institute of Industrial Science, The University of Tokyo
- Project Professor** Sugano Tomoko
Professor, Institute of Industrial Science and Deputy Director General, Division of University Corporate Relations, The University of Tokyo
Deputy Director, Public Relations Strategic Planning Office, Division for Strategic Public Relations, The University of Tokyo
Patent Attorney
- Project Lecturer** Ouchi Takanari
Lecturer, Institute of Industrial Science, The University of Tokyo
Lecturer, Integrated Research Center for Sustainable Energy and Materials, The University of Tokyo

Main Activities in Fiscal 2021 * Positions and other information are as of fiscal 2021

- July 2021
The 96th Rare Metal Workshop: "General Discussion: How Should LIB Recycling Be?"
- November 2021
The Science Council of Japan Open Symposium: "Why SDGs? - SDGs and Carbon Neutrality in Resource and Material Circulation-" (Co-sponsor)
JX Nippon Mining & Metals Director & Senior Executive Officer Yasuda Yutaka gave a lecture titled "Current Status and Prospects of Nonferrous Metals Companies' Contribution to the SDGs: SDGs in Resource and Material Circulation," where he introduced our initiatives
- January 2022
Press conference for Commencement of the Third Period
Held the 9th Precious Metals Symposium: "Frontier of Extraction and Recycling Technology for Precious Metals," for which this unit is a joint organizer, in conjunction with the press conference

Building a Development Framework and Fostering Development Personnel

The Group is working to build a framework for the continuous generation of innovative technologies and products, such as decarbonization technologies, by promoting DX support in the areas of production and development, developing platforms for the creation of new development ideas, and strengthening development process management. In addition, we are fostering personnel responsible for technology development and technology-based business development.

Strengthening Internal Processes for New Business and Technology Development

We have introduced the Stage-Gate Process as our management system for business development. In addition, we practice Idea Seed Bank activities as a platform for generating topics and ideas. These efforts are handled by the Advanced Technology & Strategy Department, a department dedicated to the planning and formulation of Group-wide technology strategies.

● Introduction of the Stage-Gate Process

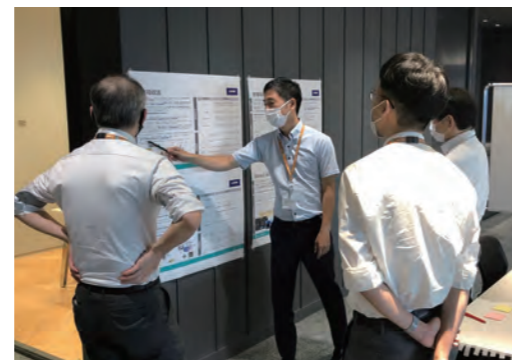
In promoting new development themes, we have introduced the Stage-Gate Process, which divides the development process into multiple stages. We use Stage-Gate Process for applications from discovery of medium-to long-term topics to commercialization for new products and technologies. The effective functioning of this Stage-Gate Process promotes activities that continuously generate innovative technologies and products, such as decarbonization technologies.

● Development of Platforms for Generating Ideas

The Idea Seed Bank (ISB), one of the Advanced Technology & Strategy Department's initiatives, is a platform to encourage employees to generate and cultivate ideas. It provides support for the conception of ideas, support for internal reviews, and discussions among members. It also offers a forum for employees from different departments and sites can interact with each other, providing them stimulus to give shape to their own ideas. One of these ideas generated at the ISB has even been approved as a development theme for one of our divisions in August 2021. The scope was expanded to the corporate departments and the Tantalum and Niobium Division in fiscal 2021, and to all divisions in fiscal 2022.

Internal Training Held by the Advanced Technology & Strategy Department

In addition to human resource development through the Idea Seed Bank, our Advanced Technology & Strategy Department holds cross-organizational study groups to help each individual member of the Group understand the Company and products outside of their responsibility, and to promote cooperation between divisions beyond their own. At these cross-organizational study groups, all employees learn about each division's business lines, products, and services. Through active Q&A and discussion, each employee gains a better understanding of the Group, which in turn leads to wider communication with external stakeholders. Through these efforts, we are developing human resources who can play an active role in finding potential co-creation partners, exploring new development themes, and further expanding existing businesses.



A discussion at a workshop held by the Advanced Technology & Strategy Department

Column

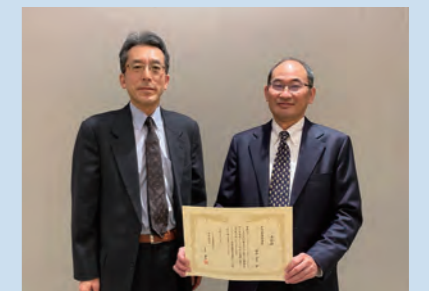
Intellectual Property Initiatives

Intellectual property is an important asset for the technology-based company that we, the JX Nippon Mining & Metals Group, aim to be. Our intellectual property, technology, and business department work together to strategically protect and utilize intellectual property with the goal of maintaining our competitiveness and a stable supply of materials. We also respect the valid intellectual property of other companies and respond appropriately to the risk of intellectual property infringement.

Initiatives for Promoting Invention

In accordance with the Patent Act, the Group has established the Regulations Concerning Handling of Employee Inventions. In addition to incentives at the time of application and registration, we have established our own unique system to award inventors of profitable patents and inventors of outstanding inventions to encourage development and invention and promote activities as a technology-based company.

In fiscal 2021, nine inventions were eligible for awards, including improvements in sputtering target quality, increased copper foil productivity, and the development of a valuable metal recovery process. In addition, we also recognize inventions that are kept secret as expertise, as well as patents.



Fiscal 2021 award ceremony

Developing Intellectual Property Human Resources

The development of intellectual property human resources is important to carry out our intellectual property strategy. In the interest of appropriate acquisition, protection, and utilization of intellectual property and management of intellectual property risks, the Group provides all employees, including clerical staff, with intellectual property education based on a systematic program and using its own teaching materials, as shown on the right.

In addition, in order to address intellectual property work that is becoming more sophisticated every year, the Intellectual Property Department encourages the acquisition of patent attorney qualifications and conducts study groups within the department to further improve practical skills and enhance expertise.

■ Educational programs implemented in FY2021

- Education by job function enabling employees to acquire necessary knowledge in accordance with intellectual property skills
Carried out multiple programs, including new employee education, third-year education, and fundamental education for technical employees
- Specialized intellectual property training by external lecturers
Carried out programs such as seminars on drafting strong patent specifications
- Workshops on the IP landscape
Carried out workshops on simulated IP landscapes with marketing and intellectual property staff

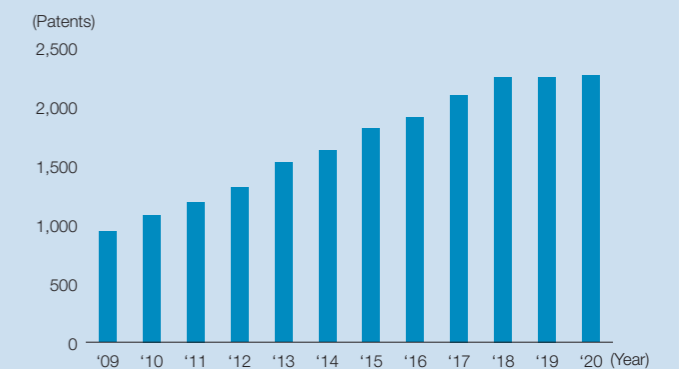
Status of Held Patent Rights

Our Group is actively promoting research and development to become a technology-based company. The intellectual property department collaborates with the business and research department to appropriately protect and utilize inventions generated in the course of research and development as intellectual property, thereby contributing to our businesses.

Reference

Special Feature 3: Further Accelerating our Digital Transformation (DX) Strategy > Promoting Strategic IP Strategies ⇒ Page 60
Activities Related to COVID-19 > Participation in the IP Open Access Declaration Against COVID-19 ⇒ Page 97

Number of Patents Held in Japan



Efforts to Cultivate the Next Generation

In order to keep stability in securing and supplying irreplaceable nonferrous metal resources and materials, it is essential to develop human resources who can take on future challenges. Our Group provides young people, mainly from elementary school to high school, with opportunities to gain experience and hands-on practice in a variety of areas, and to learn about nonferrous metals.

Social Studies Field Trip Program for Elementary School Students

On February 6, 2022, we held the Getting to Know the Copper Around Us program as a social studies field trip program for elementary school students. This program was hosted by the Shiba Regional City Office in Minato City for the second consecutive year. Three parent and child groups totaling nine participants joined the program. Participants took part in quizzes and watched videos about copper, learning about the characteristics of copper and how it is useful in our lives. They also participated in an experiment on cleaning a 10-yen coin with seasonings and an experiment on heat conduction using different types of metal rods.

Participating elementary school students commented that the 10-yen coin experiment was fun and that they would like to try another experiment next time, while parents said that they learned a lot about copper through the experiment and that they are looking forward to next year's event. The positive attitudes displayed by the children toward the experiments and the enjoyable conversations they engaged in reaffirmed the importance of continuing to provide opportunities for interaction with the local community.



The program was held with thorough measures against the spread of COVID-19

Held the Rikochallenge Summer of 2021

We support the Rikochallenge (science and engineering challenge) program to help girls experience work in science and engineering, an initiative led by the Gender Equality Bureau of the Cabinet Office. Rikochallenge is an initiative aimed at supporting future career choices for female students interested in science and engineering fields. As part of this initiative, the Group has held plant tours and hands-on experiment sessions every year since 2015 (sessions were canceled in fiscal 2020

due to the COVID-19 pandemic).

In fiscal 2021, events were held for junior high students (male and female), and were limited to the Kurami Works (Kanagawa Prefecture) and the Saganoseki Smelter & Refinery (Oita Prefecture) of JX Metals & Smelting Co., Ltd. In addition to providing an opportunity to experience the unique sensations of being on-site at each location, we introduced the social contributions of copper and other nonferrous metals and thoughts from science and engineering employees about their work. Through these events, we will continue to communicate the role of nonferrous metals in supporting society and the possibilities that science and engineering jobs create.



Kurami Works (August 2, 2021)



Saganoseki Smelter & Refinery (August 2 and 10, 2021)

VOICE

Comments from a Rikochallenge Organizer

Students from nearby junior high schools toured our plant and conducted experiments such as electrorefining and solvent extraction. Many participants commented that the event sparked greater interest in science and science-related occupations. They expressed enjoyment in learning about the properties of copper and other nonferrous metals and actually experiencing these, making them like science even more. The content was designed to help students realize the fun of science through hands-on experience of what they have learned in class. For myself, I also enjoyed learning alongside the students on the organizing side.



JX Metals Smelting Co., Ltd.
Administration Department (as of the event)
Natsuhara Miyu

University of Tokyo Faculty of Engineering Students Invited to Head Office Tour

In December 2021, 14 students from the University of Tokyo's Department of Systems Innovation, part of its Faculty of Engineering, along with Professor Tokoro Chiharu and Associate Professor Takaya Yutaro of the same department, were invited to visit our head office and attend a workshop. Through a tour of the showroom and a simulated experience of the Saganoseki Smelter & Refinery's operations using virtual reality (VR), participants learned about the processes by which copper and other nonferrous metal materials are provided to society and contribute to its development. In addition, a workshop was held on the theme of product development, where active discussions were held on the topic of what parts of daily life copper's antimicrobial properties can be utilized in. Many students who participated in the seminar commented that it gave them an understanding of how nonferrous metals are utilized in various fields.



Participants touring SQUARE LAB



Simulated experience of an operation site using VR

Popularizing STEAM Education

We have been a regular member of the Platform for Learning Innovation - Japan (PLIJ) since its establishment. PLIJ aims to be a groundbreaking organization that brings together industry, academia, government, and public education with a mission to accelerate innovation, primarily in elementary and secondary education, focused on the pillar of STEAM education. Through our membership in the PLIJ, we will continue our efforts to nurture the next generation for as many children as possible, and to help cultivate the future leaders of our society.

Materiality 2

Provide Advanced Materials That Support Lives and Lifestyles

Providing Educational Content

We provide content on our website that allows children to learn about copper in the form of quizzes and games in order to increase the interest of the next generation in nonferrous metals.

● Webpage for Kids: What's Going on With Copper-kun?

Based on the three concepts of learning, having fun, and participating, this content allows children to learn about copper while having fun.



WEB What's Going on With Copper-kun?
(Japanese only)
<https://www.jx-nmm.com/copper/>



WEB A quick and easy-to-understand story about copper (Japanese only)
<https://www.jx-nmm.com/copper/profile/>



● Webpage for Junior High and High School Students: Nonferrous Metals Creating the Future

While surprisingly few people have a firm grasp on the basics of nonferrous metals and its manufacturing process, this website presents the world of nonferrous metals in an easy-to-understand manner.



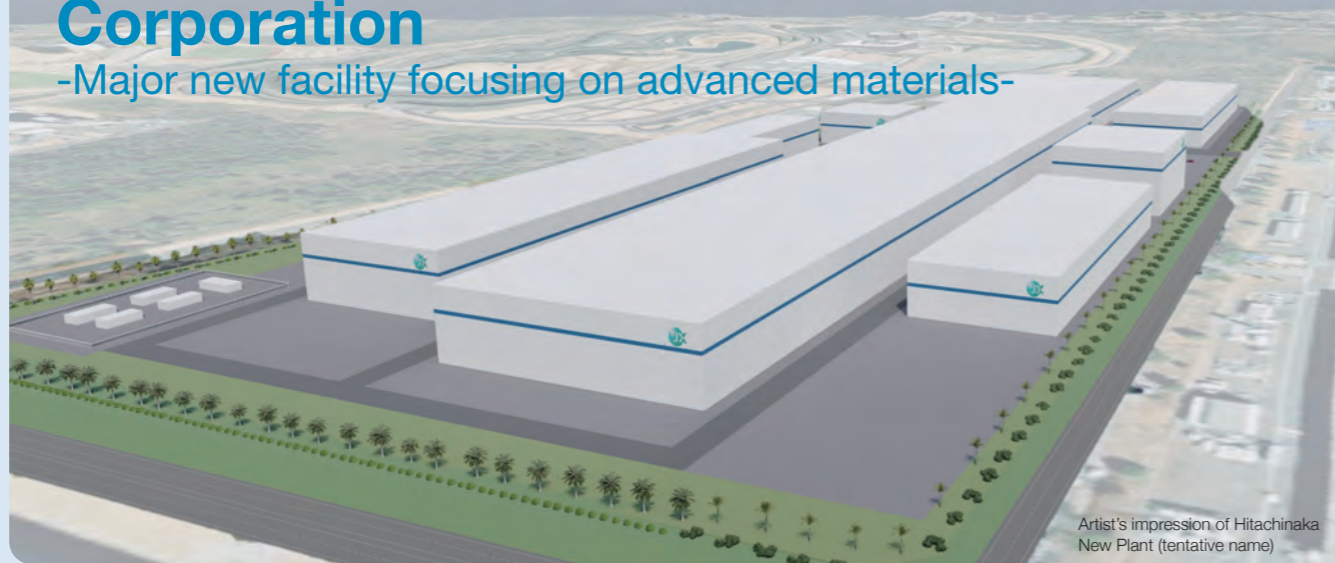
WEB Nonferrous Metals Creating the Future (Japanese only)
<https://www.jx-nmm.com/future/>



Column

Relationship between Ibaraki Prefecture and JX Nippon Mining & Metals Corporation

-Major new facility focusing on advanced materials-



Artist's impression of Hitachinaka New Plant (tentative name)

JX Nippon Mining & Metals Corporation traces its roots back to the start of operations at the Hitachi Mine in Hitachi, Ibaraki Prefecture, in 1905. Since then, we have contributed to the development of the city and industry of Hitachi by supplying copper resources. We continue to provide a stable supply of a variety of products to our customers around the world. Today, we have several production facilities in the prefecture. These include our main Hitachi Works, a combined facility for manufacturing and recycling advanced materials, and Isohara Works, where we manufacture materials used for semiconductors and flat panel displays. In addition, we are constructing three new facilities, including the Hitachinaka New Plant (tentative name), which is mentioned on the next page. We have a very close relationship with Ibaraki Prefecture, and the area is very important to our business.



Ibaraki Prefecture Basic Information

- **Prefectural Government Office:** Mito City
- **Population:** Approximately 2.85 million people (11th in Japan)
- **Area:** Approximately 6,097km² (24th in Japan)
- **Main rail connections:** JR Joban Line, JR Mito Line, Tsukuba Express, Kashima Rinkai Railway-Oarai Kashima Line, and Hitachinaka Kaihin Railway-Minato Line
- **Out-of-prefecture companies located in prefecture:** largest number of any Japanese prefecture
- **Professional sports teams:** Kashima Antlers (soccer), Mito HollyHock (soccer), and Ibaraki Robots (basketball)

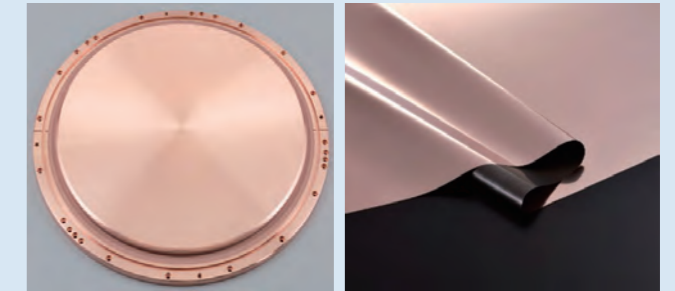
* Source: Ibaraki Prefecture official website

Large-scale new plant in Hitachinaka City under construction

In March 2022, we acquired a large site in Hitachinaka City for the construction of a new plant. In addition to being involved in existing areas of growth, such as sputtering targets for semiconductors, treated rolled copper foil, and high-performance copper alloys, the new plant will be a core center of our Group for new business related to advanced materials. Underlying the construction of the new plant is our desire to satisfy the highly anticipated growth in demand for our advanced materials that will come with ever-increasing global digitization and electrification. To that end, we fully intend to establish new manufacturing and R&D facilities here and expand our supply capacity.

The new plant will be our largest investment to date in advanced materials. It is scheduled to start operations in stages beginning in fiscal 2025, and it will contribute to the reliable supply of advanced materials, regional economic development,

and job creation. In addition, the location is easily accessible from our existing plants in Ibaraki Prefecture and our Tokyo headquarters. This will allow us to further strengthen inter-group cooperation and build a more efficient operational structure.



Sputtering target for semiconductor

Treated rolled copper foil for smartphones and other devices

Contributing to the Community

Since our establishment, the JX Nippon Mining & Metals Group has always conducted business in the spirit of coexistence and with a desire to share our prosperity with the local community. So as we look ahead, with the construction of our new plants and the importance of reliable supply chains growing, we are promoting activities to further develop the region and increase our visibility.

One such specific initiative is becoming an official partner of Mito HollyHock, a soccer team in the Japan Professional Football League (J-League), in April 2022. In addition, we have made

ourselves more visible in the local community by sponsoring the LuckyFM Green Festival, a music event organized by Ibaraki Broadcasting Corporation at the National Hitachi Seaside Park, and the Hitachinaka Festival, which is held at various locations in Hitachinaka City. We are also advertising on station billboards and on the outside of trains in the region. These events have also led to more contact among our facilities in the prefecture as well as increased employee motivation.



Joint press conference on the construction of the Hitachinaka New Plant (tentative name) (Left: Kazuhiko Oigawa, Ibaraki Prefecture Governor Right: Seiichi Murayama, Group President)



Mito HollyHock JX Nippon Mining & Metals Group "Thanks Match"



Sponsorship of firework display at LuckyFM Green Festival



In-prefecture advertising (Mito Station)



In-prefecture advertising (Kashima Rinkai Railway-Oarai Kashima Line)

Column

Joint course with Kyoto University Graduate School of Advanced Integrated Studies in Human Survivability (*Shishu-Kan*) toward achieving the SDGs.



On the basis of the Comprehensive Collaborative Research Promotion Agreement for Achievement of the SDGs signed in January 2020 between JX Nippon Mining & Metals and Shishu-Kan, the Joint Chair of Global Social Resilience for the Achievement of SDGs, was established in May of the same year. With central focus on the keyword “SDGs,” this program aims to identify, extract, and research issues in all domains and provide solutions to global issues related to the SDGs.

Four Areas of Activity

Program-Specific Professor Hashimoto Michio and Program-Specific Associate Professor Shimizu Mika, two Shishu-Kan professors, have been appointed to lead the joint course. Its first event (held online in May 2020), an online lecture held on May 2020, covered the program’s two faculty members’ research fields and content, with participation from our Company directors and employees. This lecture serves as the starting point for our work to advance the following four core activities from fiscal 2021 onward. (See table on right.)

Activity	Details
1. Metals Business Study Group	Company employees and Shishu-Kan students work together to study and plan solutions to various issues facing our business
2. Resilience Workshop	Workshops for Company employees on various resilience topics
3. SDGs Future Vision Study Group	Lectures by Shishu-Kan faculty members and research presentations and discussions by students in each of Shishu-Kan’s eight academic fields*.
4. Decarbonization Workshop	Discussion on net zero CO ₂ emissions from the perspectives of both academia and business

* Humanities and Philosophy; Economics and Management; Law and Politics; Linguistics; Science and Engineering; Medical and Life Science; Informatics and Environmental Studies; and Art

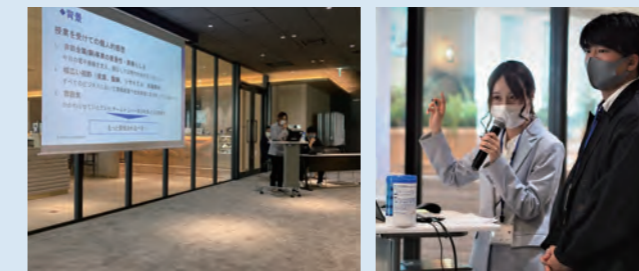
Metals Business Study Group (Led by Program-Specific Professor Hashimoto Michio)

After a presentation giving an overview of the JX Nippon Mining & Metals business by our employees, Shishu-Kan faculty and students visited the Saganoseki Smelter & Refinery of JX Metals Smelting Co., Ltd., Hitachi Works, and Nippon Mining Museum. This was followed by a presentation from the vice president of our company on developing the nonferrous metals business in a way that achieves SDGs. After the presentation, our employees and Shishu-Kan students engaged in joint workgroups. Starting in fiscal 2021, presentations of the results of this joint

work have been held. Shishu-Kan’s faculty members attend—including Shishu-Kan deans Professor Takara in 2021 and Professor Sekiyama in 2022—as well as our company president and other executives. In addition, they have engaged in active discussions. In fiscal 2022, eight students attended, including two international students, with some of the presentations given in English, making it a study group that embodies its diversity. Participation in the study group earned student’s academic credits at Shishu-Kan.

■ Presentation Themes

- Analysis of nonferrous metal price trends using financial engineering, and utilization of mines post-closure
- Study of contributions to the local community in the Hitachi area
- HR strategy for 2050 (secure, train, and utilize talent; give back to society; and public relations)
- Hitachi Copper Museum Project (Proposal for renovation and improvement of Nippon Mining Museum)
- Establishment of new recycling systems and development of space mineral resources
- Opportunities to provide materials for healthcare industry
- Development of comprehensive SNS strategies



Presentation of results



Lecture at Shishu-Kan



What is Shishu-Kan?

It is a graduate school that offers a five-year integrated doctoral program to foster global leaders who are ready to take on the various challenges facing modern society. These challenges include climate change; natural disasters, regional conflicts; super-ageing societies; poverty; inequality; energy, food, and water issues; and harnessing artificial intelligence. The school is developing a unique curriculum that transcends the barriers between the humanities and sciences to nurture talented people with overarching views. (Note: *Shishu-Kan* is the Japanese acronym for this graduate school.)



Resilience Workshop (Led by Program-Specific Associate Professor Shimizu Mika)

Program-Specific Associate Professor Shimizu Mika held series of workshops on resilience for our employees. By experiencing resilience thinking through workshops, employees were provided with opportunities to reflect their own insights and work styles. This way of thinking includes acting as a *middleman* in bringing about change and being able to think the whole and details in a continuum (as a metaphor, “*looking at the forest and trees in a continuum*”). The workshops have been held more than 15 times since fiscal 2021, being attended by a wide range of participants, from junior employees to newly appointed managerial staff.

In addition, Program-Specific Associate Professor Shimizu gave a lecture titled “To link is to live” to students from Saganoseki Elementary School and Saganoseki Junior High School in Oita City. These are two schools near the Saganoseki Smelter & Refinery of JX Metals Smelting Co., Ltd. To commemorate the 100th anniversary of the Saganoseki Smelter & Refinery in 2016, JX Nippon Mining & Metals and JX Metals Smelting began a painting and essay contest every three years for students from nearby elementary and junior high schools. This lecture provided an opportunity for students to receive inspiration and insights for working on their paintings or essays toward the third contest to be held this summer.



Workshop for new managerial staff



Lecture at Saganoseki Junior High School

SDGs Future Vision Study Group (Led by Shishu-Kan faculty)

Eight members of faculty gave special lectures to our board members and employees on cutting-edge trends in each of the eight academic fields covered by Shishu-Kan. Many employees participate in these sessions, giving them opportunities to encounter topics they would not normally come across in their regular work. It is also a chance to see things from different perspectives.

Eight Academic Fields	Lecture Themes
1. Informatics and Environmental Studies	Overview of Shishu-Kan and its Disaster Risk Research
2. Medical and Life Sciences	Preventing dementia from the perspective of research on intervention
3. Economics and Management	Sustainable development in developing countries and challenges related to making renewable energy available
4. Linguistics	Global human resources necessary going forward
5. Science and Engineering	Global issues from perspective of natural sciences and encouraging cross-disciplinary research
6. Humanities and Philosophy	Philosophy of attention in the information age and mindfulness and inherent wisdom of Buddhism
7. Law and Politics	Toward sustainability transformation (SX) and beyond ESG management
8. Art	Innovations in art



Lecture and Q&A session



Decarbonization Review Workshop (Led by Professor Dimiter Ilnazov)

Discussions were held from the perspectives of both academia and business on the fiscal 2050 net-zero CO₂ emissions goal of JX Nippon Mining & Metals. Members of the Carbon Free Project and our employees and JX Nippon Research Institute for Technology and Strategy Co., Ltd. participated in a lively discussion with faculty and students from Shishu-Kan on the following topics.

1. Procurement of electricity from renewable energy sources
2. Side effects of decarbonization
3. Renewable energy development and its coexistence with local communities



Participants touring the Square Lab

VOICE

Comment from a Course faculty member

There are many examples of industry-academia collaboration, but more often than not the academia of industry-academia only means faculty, not students. We wondered if students, especially doctoral students with their cutting-edge expertise and fresher minds, could be new partners with industry. With this in mind, we began this initiative. When we tried it, it was a real eye-opener—and some raw nerves were hit, but we became aware of a lot of different things. And it was a valuable opportunity for students to exchange knowledge with the real world.



Program-Specific Professor at Kyoto University, Shishu-Kan
Hashimoto Michio

Comment from a Course faculty member

While the resilience thinking and approach I promote came from the academic world, it is very relevant to human resources development, SDGs, and innovation in business. It is no exaggeration to say that resilience thinking is one of the essences for a company to survive in symbiosis with various elements in global society. It is really great to witness the synergy among different elements and the dynamic changes among participants that arise through this series of workshops. By organizing these workshops, I hope to create a collaborative path toward achieving the SDGs.



Program-Specific Professor at Kyoto University, Shishu-Kan
Shimizu Mika

Comment from participant in Metals Business Study Group

My research field is tissue engineering, and I chose the Advanced Study of the Metals Business class because of its unique curriculum and the positive feedback I received from senior students. In fact, I learned from JX Nippon Mining & Metals employees not only upstream and downstream business operations, but also efforts toward environmental and social impacts. By learning from JX Nippon Mining & Metals in terms of how the company has grown and evolved while facing numerous challenges, such as the depletion of mineral resources, environmental pollution, advancement into overseas markets, and intensified global competition, I hope to identify my own *core technology*, to repeatedly challenge myself, and to brush up my decision-making capabilities.



Kyoto University, Shishu-Kan (2nd year student)
Mutsuda Kaori

Comment from participant in Metals Business Study Group

I'm very grateful to have had the opportunity to collaborate with JX Metals company as part of Kyoto University's exchange program. It was a very rewarding experience, both personally and professionally. I would love to have more opportunities to collaborate in the future.



Kyoto University, Shishu-Kan (2nd year student)
Sebastian Escobar

Materiality 3 Create Attractive Workplaces

Dynamic workplaces where employees can demonstrate their unique capabilities and be healthy in mind and body are essential for any enterprise seeking sustained growth. The JX Nippon Mining & Metals Group strives to create workplaces that are attractive from many perspectives. Examples include our work to ensure occupational health and safety, provide an appropriate personnel evaluation system, and offer human resources training.



KPIs and Progress

Assessment: 😊 Achieved/Steady Progress ☹️ Not Achieved

KPI	Fiscal 2021 Results/Progress	Assessment
Reduce serious occupational accidents: Less than 0.7 accidents (four days or more of lost work time) per 1,000 workers in fiscal 2021	The occupational injury rate per 1,000 Employees in fiscal 2021 was 1.71. With solemn consideration for the accidents that have occurred, we constantly strive to improve our health and safety management system and prevent occupational accidents by improving the effectiveness of our risk assessments and enhancing the ability of employees to investigate the causes of accidents.	☹️
Increase annual leave utilization rate: 80% or more in fiscal 2021	Thanks to our ongoing efforts to create a work environment that encourages employees to take vacation days and to provide more days where employees are encouraged to take leave, the annual leave utilization rate improved versus the previous fiscal year, although it only reached 77.9%. Moving forward, we will continue to take actions to encourage employees to take more vacation.	☹️
Implement initiatives to revitalize people and organizations	We enhanced a variety of measures for Activity-Based Working (ABW) and vitalizing communications. In addition, we took action to build an environment in which diverse human resources can play an active role through securing and utilizing highly specialized and senior citizen talent, as well as introducing a new personnel system.	😊
Initiatives for health promotion: Cancer screenings for 70% of employees or more in fiscal 2021	Each operating site formulated measures to increase the screening rate and held seminars on cancer prevention by medical specialists. These and other efforts tailored to their respective environments resulted in a 63.1% screening rate, a significant improvement from the previous year (54.7%). For fiscal 2022, we are promoting activities aimed at further increasing the screening rate by carrying out e-learning for all employees, distributing leaflets recommending cancer screening, and holding cancer prevention seminars.	☹️
Maintain and improve hiring rate for disabled persons: 2.3% or more in fiscal 2021	In fiscal 2021, employees with disabilities comprised 2.21% of our total number of employees. We will continue to maintain and improve the hiring rate for disabled persons through bolstering the newly-established Cheerful Support Office in fiscal 2021. Furthermore, we will actively provide support and roll out measures for enabling disabled persons to lead fulfilling social lives.	☹️

Ensure Safety and Promote Health

Recognizing that the safety and health of its employees is the foundation for sustainable growth, the JX Nippon Mining & Metals Group is committed to creating a workplace environment that ensures safety and promotes health.

JX Nippon Mining & Metals Basic Policy on Health and Safety

We place the highest priority on ensuring the health and safety of people working in all areas of business operations at the JX Nippon Mining & Metals Group and create attractive workplaces by providing safe, secure, and healthy working environments.

1. We will comply with all laws and regulations relating to health and safety, establish voluntary standards required to achieve compliance, and rigorously manage and adhere to such standards.
2. We will strive to continuously improve and enhance industrial health and safety management systems and achieve health and safety goals.
3. We will actively provide information and education in order to develop human resources that think and act spontaneously, and raise health and safety awareness throughout the organization.
4. We will identify hazards in all areas of business operations, work to eliminate such hazards and reduce risk, steadily achieve annual accident reduction targets, and ultimately aim to ensure no accidents ever occur.
5. We will work to maintain and improve employees' mental and physical health by ensuring good communication and comfortable working environments and taking steps to maintain health and prevent sickness.

Organization for Occupational Health and Safety Management

The Group maintains health and safety committees and other bodies at operating sites and Group companies in keeping with the Industrial Safety and Health Act. We have also established a system to have discussions with workers, including those from subcontractors stationed permanently, within the framework of our management system. At our head office, the Central Health and Safety Committee meets once a year, attended by representatives (key safety managers and labor union branch committee chairs) from the divisions and operating sites. The Central Health and Safety Standing Committee meets five times a year, attended by standing committee members of the former (safety managers at each division and the three officers from the Central Labor Union). We also hold joint labor/management health and safety visitations (once a year) and Group safety supervisors' meetings (twice a year) to exchange information on health and safety. In fiscal 2021, in light of the impact of the spread of COVID-19, our basic posture was to hold hybrid in-person/online meetings, and joint labor/management health and safety visitations were held in person at operating sites with infection control measures in place.

Environment and safety audits are conducted periodically by a team under direct supervision of the president at operating sites directly run by the Company (including Group companies within the sites) and major domestic Group companies. Issues discovered in the audits are reported to the president, and also notified to the respective operating sites. Audits were to be conducted at 16 sites in fiscal 2021, including eight sites for which on-site audits were postponed in fiscal 2020 due to the spread of COVID-19. However, due to the spread of the virus,

on-site audits were only completed at 12 of these locations, while all locations underwent document audits through online channels. No major issues were identified. For those locations only undergoing document audits, on-site audits are to be postponed to fiscal 2022.

We had acquired OHSAS 18001 certification at 11 of our domestic operating sites and two overseas operating sites, and has been preparing for the introduction of ISO 45001 (JIS Q 45100) following the abolition of OHSAS in March 2021. Compared to ISO 45001 (JIS Q 45001), ISO 45001 (JIS Q 45100) enables the promotion of Group-wide occupational health and safety activities that involve more on-site workers. We are revising and creating new management documents including OHS manuals, and are systematically converting and acquiring new certifications, aiming to further improve health and safety levels. In fiscal 2021, we will complete conversion at these sites. From fiscal 2022 onward, we will promote the introduction of this occupational health and safety management system at more sites, with the aim of obtaining new certification at yet-uncertified sites.

Management Policy on Health and Safety for 2021

The Group formulates the Management Policy on Health and Safety each fiscal year. The goals and key policy measures are set based on analysis of health and safety performance in the previous year. The policy is discussed and approved by the Central Health and Safety Committee and then promulgated across the Group.

<p>[Goals] [Safety and Disaster Prevention Items]</p> <ol style="list-style-type: none"> Accidents with lost work days or worse: Zero Targets for managing the number of accidents for the entire Group (1) (Shared domestic/overseas sites) Accidents without lost work days or worse: Reduction of 50% or more of the previous year's results (2) Occupational injury rate per 1,000 employees, domestic Group (four or more lost workdays): 0.7 or less (5 injuries or less) Fires and explosions: Zero <p>[Key Measures]</p> <ul style="list-style-type: none"> Promoting inherent safety (strengthening activities to prevent serious accidents from occurring) Expanding health and safety education Strengthening systems for safer construction execution 	<p>[Health and Other Items]</p> <ol style="list-style-type: none"> Occupational diseases: Zero Rate of lost work days due to ordinary illnesses: Reduction by 10% or more from the average in the previous three years Statutory regular health checkups: 100% Cancer screening rate: 70% or more Influenza vaccination rate: 100% Traffic accidents (as perpetrator or victim): Reduction by 10% or more from the average in the previous three years <ul style="list-style-type: none"> Maintaining and promoting mental and physical health Continuing to implement traffic accident prevention (including work-related traffic accidents)
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Safety Education at a Safety Education Center

In order to raise the sensitivity to hazard for each and every employee and enhance their safety awareness, the Group has established the Safety Education Center, where we conduct experience-oriented safety education, in Hitachi City, Ibaraki Prefecture. Here, sensitivity to hazards refers to sensing danger correctly. Sharpening this sensitivity leads to workers being able to avoid danger.

Since many of the occupational accidents that have occurred are recurrences of past cases (similar accidents), the center has prepared a program to help workers see that potential accidents are always present, and to improve worker understandings of danger and their sensitivity to hazards through simulated experiences of past occupational accidents. In addition, we have implemented a new educational curriculum that utilizes VR technology, enabling students to have hands-on experience as a victim of an accident or disaster, a situation not easily simulated in real life. In recent years, while the number of occupational accidents among employees has been decreasing, the number of occupational accidents among employees from Subcontractors has become an issue. To address this, we have introduced midsize education facilities at our core operating sites to improve the sensitivity to hazards and safety awareness of not only our Group employees but also those of our Subcontractors. The Safety Education Center and the midsize education facilities work in unison to eradicate occupational accidents among workers.



VR experiential education

Accident Dramatization Videos

In addition to setting up safety training facilities at each operating site, we produce videos based on actual past accidents that teach safety by reproducing these accidents in a visual medium. We take opportunities such as our safety lectures to use these materials and raise safety awareness and sensitivity to hazards. These videos are based on accidents that have occurred both within the Group and outside the Group. They offer viewers an emotional understanding of how disastrous an accident can be and teach the viewer what causes accidents, as well as countermeasures against them, and they facilitate communication at Group companies.

Raising Safety Awareness Through E-Learning

The Group strives to ensure the safety and health of all persons connected to our business, and to elevate safety-first awareness and sensitivity to hazards. We periodically conduct safety training programs held via e-learning for all employees at domestic and overseas Group companies. Training consists of safety basics and knowledge that people can absorb in a short time. In fiscal 2021, 2,865 persons, or 73% of our workforce, completed training on the topic of occupational accidents.

Producing and Displaying Safety Awareness Posters and Digital Signage*

The Group produces safety awareness posters based on actual accidents that have occurred in the Group and externally. These posters are displayed mainly at manufacturing sites to raise safety awareness and prevent the recurrence of accidents. The posters provide at-a-glance information on key safety points, related laws and regulations, and disaster case studies for each topic, and are designed to bring awareness to both young and experienced employees. We also use monitors installed in several office spaces on each floor to display digital signage for raising safety awareness among employees at the head office.

* Digital signage: Electronic display monitors



Actual safety awareness posters in use

Activities in 2021 to Ensure Safety (Domestic Operating Sites)

● Risk assessments

Each of the Group's operating sites carries out its own risk assessment activities based on our occupational health and safety management system. Risks at operating sites are managed by implementing PDCA cycles, consisting of hazard identification, devising accident scenarios, risk assessments, necessary measures to mitigate risk (beginning by considering tangible measures first, and then intangible measures only if tangible measures are unapplicable), and evaluation of the effectiveness of those measures.

In fiscal 2021, we aimed to further strengthen these risk assessment activities by focusing on significant residual risks at each operating site and reinforcing management aspects to prevent serious occupational accidents. Improving the level of our risk assessments is an issue that we will continue to work on in the future. Our measures going forward include visualizing the progress of residual risk management and other risk mitigation, further promoting intrinsic safety measures that incorporate the concept of machine safety, and training risk assessment promoters and instructors at each operating site.

● Preventing accidents involving collisions between heavy machinery and people

One of the most important safety issues for our Group is to prevent accidents involving collisions between heavy machinery and people. In order to prevent these collisions, which can easily lead to serious accidents, we not only introduced RFID* in fiscal 2018, but, in fiscal 2021, we conducted demonstration tests and launched operation of a human detection system using AI cameras at Kurami Works. This system is designed to alert a forklift operator when a worker approaches the machine, and this testing is part of our measures to implement IoT and AI. In fiscal 2022, we will press forward with these actions even further, working with manufacturers to develop an automatic braking

system linked to our human detection system using AI cameras.

* RFID (Radio frequency identification): Technology that uses radio waves or electro-magnetic waves to read and write information on IC tags in a contactless manner



Cameras installed on forklifts

Activities in 2021 to Ensure Safety (Overseas Operating Sites)

At overseas Group companies, priority issues are set for each of the responsible divisions, and activities are implemented accordingly.

● Mineral Resources Division

In order to improve safety performance, we are continuing our efforts to ensure compliance with safety standards and to improve safety in terms of technology and awareness. We also provide services for workers at the Caserones Copper Mine, such as an accommodation camp, cafeteria, gym (currently closed due to the spread of COVID-19), and a shop. Furthermore, we are taking thorough measures to prevent the spread of COVID-19, including checking body temperature before entering the premises, antigen tests before starting work on-site, cleaning premise facilities, and ensuring social distancing in the cafeteria and on shuttle buses.



Partitions installed to stop infection from droplets at the Caserones Copper Mine

● **Functional Materials Division**

Based on our safety activities in Japan, we are actively promoting safety activities elsewhere in accordance with the laws and frameworks of each country. Specifically, we are promoting risk assessments focused on hazards, and we have established a Safety Education Center tailored to the actual situation in the relevant area. These centers are based on our Safety Education Center in Japan and are used for safety education.



Experiential risk training equipment (demonstrating puncturing safety shoes)
(Nippon Mining & Metals (Suzhou) Co., Ltd.)

● **Thin Film Materials Division**

In addition to focusing on activities to systematically implement specific countermeasures through risk assessments focused on hazards, we also focus on 5S activities, which are the basis of safety. In addition, some operating sites have implemented virtual reality (VR) systems loaded with content matching actual site conditions and used them for safety education.



VR experiential education (Nikko Metals Taiwan Co., Ltd.)

● **Tantalum and Niobium Division**

Focusing on thorough compliance with rules as the fundamental principle, we provide safety education using DVDs depicting accident cases to prevent similar past accidents from occurring again, strengthen safety patrols at each operating sites, and promote activities to identify conceivable near-miss scenarios. We also focus on reviewing risk assessments and 5S activities, which are the basis of safety. This information is shared at monthly safety meetings attended by representatives from each operating site.

Health Management System Project

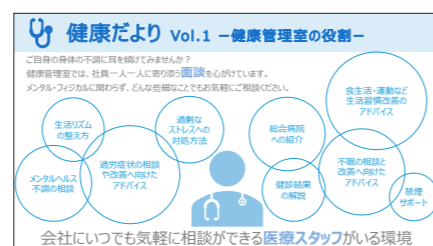
We are promoting a variety of measures to improve the mental and physical health of our employees through a project system in which all of our operating sites participate. With regard to improving the cancer screening rate, we engage in a range of messaging to employees with the aim of helping them learn about the characteristics of cancer, strive to prevent it, and as part of these efforts, get them to undergo screenings for early detection. As a result, the Group-wide average screening rate in fiscal 2021 was 63.1%, up 8.4% from the previous fiscal year. In the future, we will also offer e-learning to further foster cancer prevention awareness.

In addition, in order to keep all employees motivated to maintain and improve their physical fitness, we are conducting physical fitness tests to help them first understand their current fitness state. Regarding mental health, we work to build an environment in which employees feel comfortable consulting with industrial physicians. We do this by providing regular opportunities for employees to meet with these physicians and providing education to responsible parties at each operating site.

As the underlying mechanism for these activities, we have introduced a health management support system that enables centralized management of various health checkup results and working hour records, and are also making preparations for the assignment of public health nurses to all operating sites.



An interview with an industrial physician



Health bulletin

Promote Diversity

In compliance with relevant laws and regulations in Japan and overseas, the JX Nippon Mining & Metals Group is pursuing initiatives including the continued employment of workers aged 60 and older, hiring of persons with disabilities, women's empowerment, and hiring of non-Japanese employees. We are also developing a personnel system with consideration for sexual minority employees (LGBTQ+). Here, we are working to create an environment in which diverse employees feel fulfilled and display their abilities fully.

Measures for Diverse Work Styles

As part of our efforts to energize individuals and organizations, we are actively working to create an environment where a diverse range of people can work with a sense of motivation. Our efforts include the creation of an environment where people can work fully demonstrating their capabilities even if they are pregnant, raising a child, or caring for a family member. We provide legally mandated systems to support having and raising children, and offer our own unique systems as well. Our handbook on the support available for employees offers tips on balancing work with childcare or family care, provides an overview of the public services and company systems available for their use, and describes the roles managers should play in this context. In fiscal 2019, we also acquired the "Kurumin" certification mark related to our action plan for raising next-generation children.

With particular respect to the success of our female employees, we formulated and followed through on a plan for the five-year period to fiscal 2020 in accordance with Japan's Act on Promotion of Women's Participation and Advancement in the Workplace. In fiscal 2020, the final year for this plan's targets, we made improvements to the working environment by expanding remote work, introducing a flextime system without mandatory core hours, and expanding the use of childcare centers. We have formulated a new action plan for fiscal 2021 and beyond, and will focus on creating more opportunities for women to play an active role.



● **Remote work system**

As part of our efforts to create an environment where a diverse range of people can work with a sense of motivation, we introduced a remote work system in January 2018. During the COVID-19 pandemic, our employees have been working from both home and office to ensure the safety of our business partners, local communities, employees, and their families, while taking into account the state of the virus and requests from government agencies, etc. We have also been striving to maintain our business to fulfill our social responsibility to deliver essential products to society. Even after the COVID-19 pandemic subsides, we will continue to utilize our remote work system so that a wide range of diverse employees, not limited to those with circumstances such as childcare or nursing care, can play an active role in the Group.

● **Introduction of a flextime system without mandatory core hours**

In addition to the current flextime system with core hours, we have introduced a flextime system without mandatory core hours at the head office and for a portion of Isohara Works, with the aim of promoting more autonomous work styles among employees. We have also defined our flextime system as covering 5:00 a.m. to 10:00 p.m., excluding late-night hours, to create a system where employees can flexibly choose their work hours.

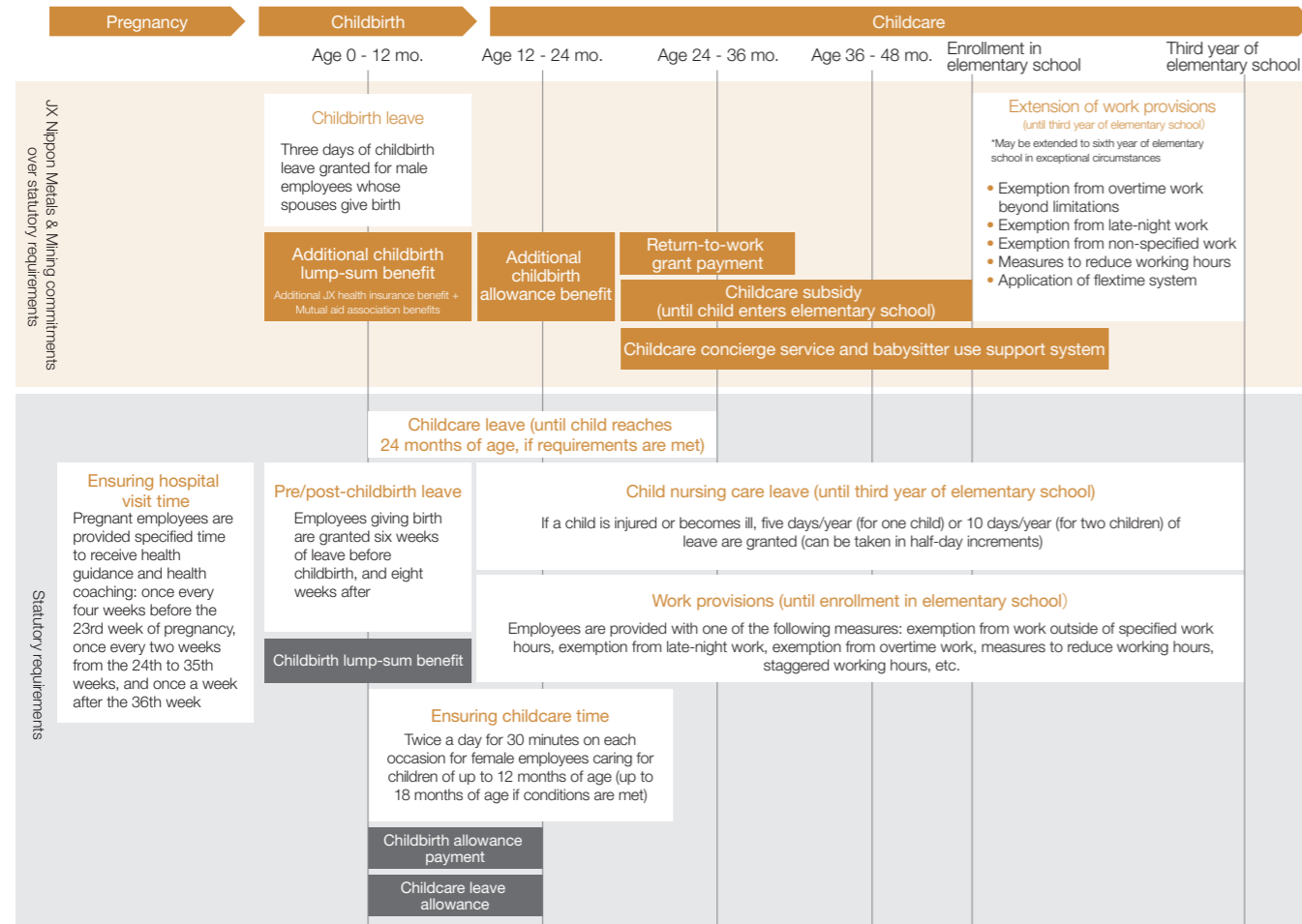
● **Securing and utilizing highly specialized and senior citizen talent**

With the establishment of JX Nippon Research Institute for Technology and Strategy Co., Ltd., we introduced a flexible employment system that is not bound by the Group's existing personnel system, and launched efforts to secure and utilize highly specialized and senior citizen personnel. In fiscal 2021, we hired a number of senior citizen employees with a high level of expertise and a broad range of knowledge to launch our business.



● **Systems for Childbirth and Childcare**

The Group provides legal standard systems related to childbirth and childcare, and offer our own unique systems as well.



● **Support system for male employees taking childcare leave**

We have provided support for childcare for some time, and in recent years the percentage of male employees taking childcare leave has been increasing. In addition to providing presentations

about our system, we are working to spread awareness of support measures by holding panel discussions with employees who have taken childcare leave or are balancing work with childcare in our Career Design Training that has been held since fiscal 2020.

VOICE

Comments From a System Beneficiary

Since joining my company, I have always been engaged in administration and human resources work, but despite that I honestly was unable to imagine myself using this system. Still, in order to raise my children with my spouse, I have taken childcare leave and successfully returned to work twice, most recently for almost a year in fiscal 2021. I was able to do this with the support of the people in my workplace. One good thing about taking leave was that I got into the habit of managing tasks better than ever before, but most importantly, I feel that the best thing to come out of it was the sense of camaraderie I gained with my spouse as we raised our children together.



JX Nippon Mining & Metals Corporation
Hitachi Works, Administration Department
Koyanagi Takuya

● **Systems for family care**

The following programs are available if an eligible family member requires constant care.

	Statutory Requirements	Additional Benefits from JX Nippon Mining & Metals
Time Off	<ul style="list-style-type: none"> For one family member requiring care: five days/year (can be taken in half-day increments) For two or more family members requiring care: 10 days/year (can be taken in half-day increments) 	
Leave	<ul style="list-style-type: none"> Maximum of 93 days may be taken in up to three periods 	<ul style="list-style-type: none"> A total of up to 730 days may be taken over the course of four leave periods Family care subsidy and leave allowance (financial support)
Work Provisions	<ul style="list-style-type: none"> Exemption from overtime work beyond limitations (exemption from overtime work in excess of 24 hours/month and 150 hours/year) Exemption from late-night work (exemption from work during late night hours except when a family member 16 years of age or older and capable of providing care lives in the same household) At least two times in three years (measures to reduce working hours) Application of flextime Exemption from non-specified work 	<ul style="list-style-type: none"> Reduction of working hours to a minimum of two hours per day, multiple times in three years

Promoting the Hiring of employees with disabilities

We are creating a workplace that understands and fulfills the desire of disabled people to go out and play an active role in society.

In the head office, we have worked to improve environments as well as assign and train dedicated staff in order to hire not only those with physical disabilities but also those with mental disabilities (intellectual and developmental). As a result of these efforts, we welcomed four new team members in January 2022 (this number has since increased to six). These team members' main duties are internal mail reception and distribution, as well

as cleaning. Going forward, we will continue to expand their range of activities. The name of the team was chosen as Cheerful Support Office, selected in an open submission process from employee suggestions. This name is designed to impart the team's nature as a group supporting the workplace with brightness and energy.

We will continue to actively support and develop various measures to enable disabled persons to lead fulfilling social lives, and by welcoming people with various disabilities as colleagues, we will enhance our corporate culture of caring and mutual support among employees.

VOICE

Comments from a Cheerful Support Office Supervisor

Each member is working with a strong desire to be useful and active as a member of society and a friend to the Company, and the speed of their growth amazes me every day. They are able to check each other's work thoroughly, confirm with their mentors what they do not understand, and proceed with their work carefully one by one to ensure that there are no mistakes. Going forward, they are planning to take on new challenges, including creating business cards for the entire Group, expanding their cleaning responsibilities at the head office building, and operational support requested from various departments.

Our members have every potential for growth. We hope you will look out for their further success in the future. We are committed to supporting our members so that they can lead fulfilling social lives and enjoy their work for the organization for many years to come.



JX Nippon Mining & Metals Corporation
Administration Department
Fukuodori Naoya

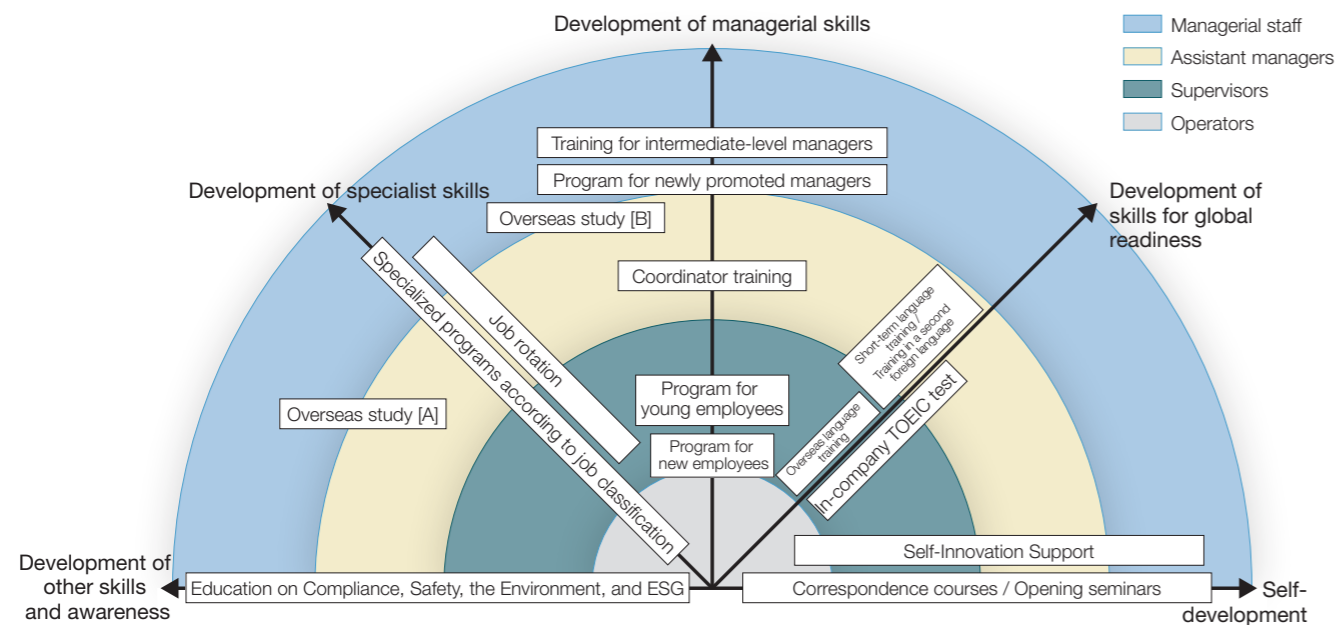
Human Resources Development

In order to achieve becoming a technology-based company set forth in the 2040 Long-Term Vision, the JX Nippon Mining & Metals Group is working to secure and develop human resources capable of creating added value.

Training System to Energize Individuals and Organizations

Since fiscal 2016, our basic policy for human resources development has included the primary goal of energizing individuals and organizations, and we have been striving for broad-based human resource development by providing various educational

programs to develop five key areas: managerial skills, specialist skills, skills for global readiness, self-development, and other skills and awareness. In addition, in order to raise awareness and improve capabilities for each employee, we offer Career Design Training as well as training to learn about our company's DNA, and various other support programs.



● Training for young employees (university and graduate school graduates)

We provide a wide range of training programs in stages for university and graduate school graduates up to five years after they are hired, including New Employee Training for teaching basic businessperson skills, and Fifth Year Training to help them gradually build a vision for their career

● Development of skills for internationalization

We promote education to globalize our talent so that they can play an active role on a global scale. In our Overseas Language Training program for second-year employees with undergraduate and graduate degrees, employees are sent to overseas language schools for about eight weeks, not only to learn the local language but also to experience different cultures and values, and to develop flexible thinking that can be applied globally. Although some of the training sessions in fiscal 2021 were postponed due to COVID-19, we are preparing to resume this training.

● DNA-related training

DNA Training: Training for employees in their third year to understand our DNA, cultivated from our founding to the present, and to recognize the role they should play as leaders of change in the future.

Education for mid-career employees: Mid-career employees are given a tour of the Nippon Mining Museum to learn about JX Nippon Mining & Metals' history.



A DNA Training session



A tour of the Nippon Mining Museum

● Self-Innovation Support

Employees may apply to any eligible external training program. On completing the program, half of the expenses will be subsidized (up to 500,000 yen per program). This is a highly flexible system because we want to address employees' wishes for self-development more than ever before.

● Career Design Training program

In fiscal 2020, we launched our systematic career development education. As part of this effort, we provide Career Design Training for young employees to learn how to envision their future careers.

VOICE

Comments from a DNA-Related Training Participant

As part of a training program for mid-career hires, we visited the Nippon Mining Museum, located on the site of the former Hitachi Mine. Since the founding of JX Nippon Mining & Metals, the organization has a history of working together with local residents to protect the environment in keeping with the Sustainable Development Goals. Visiting the site where we were founded, seeing up close the ruins of the large smokestack and rows of cherry trees that have become a symbol of environmental protection measures, and experiencing the many exhibits and detailed presentations in the memorial museum, I felt that we had faced extraordinary difficulties and made great effort in our history.

There was a deep, moving sense of reverence that reassured me that our continued commitment to "community involvement and development" and the idea of "the mine as one big family" comes with a historical context and pride built through the accumulated desires of many people involved, including generation after generation of employees and local residents. I felt that this was the foundation for continuing to face the difficult challenges that lie ahead.



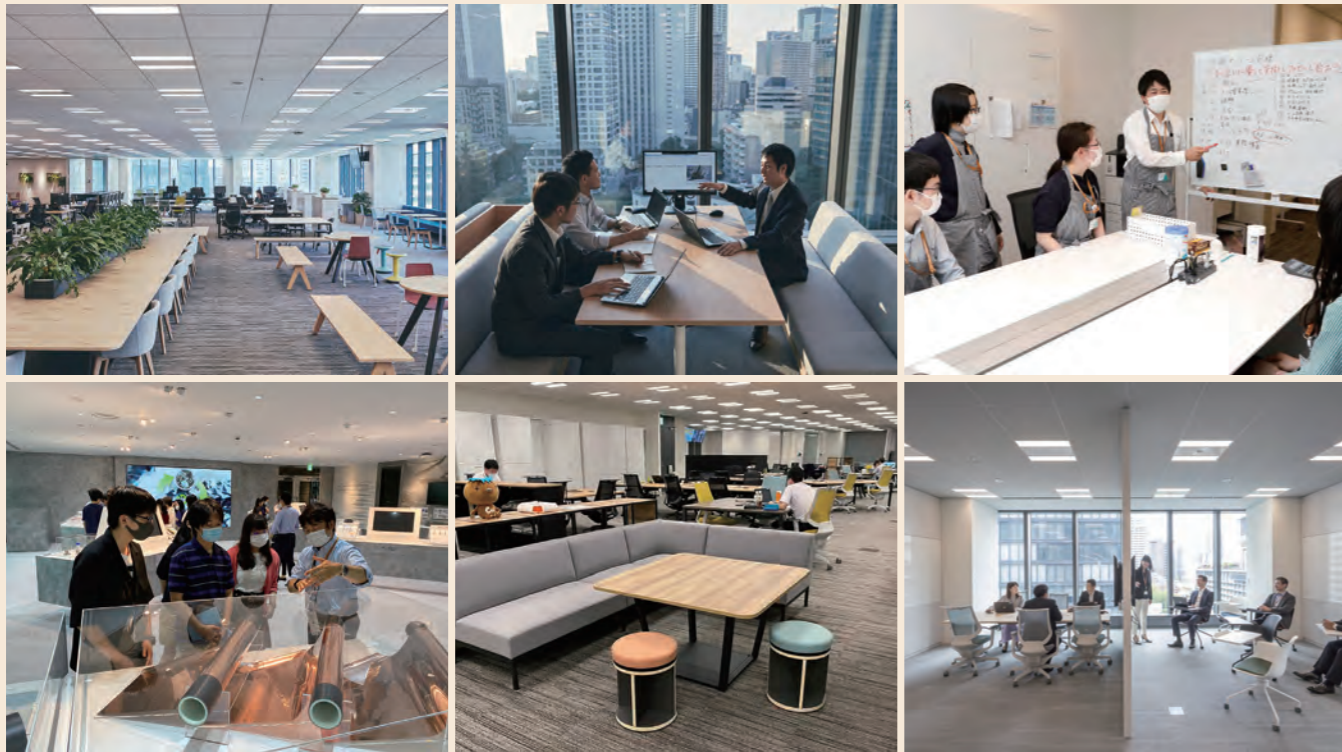
JX Nippon Mining & Metals Corporation
Internal Auditing Department
Sekiyama Aya

Column

Achieving an Office Worth Coming To



In June 2020, we relocated our head office to the Okura Prestige Tower (Toranomon 2-chome, Minato-ku, Tokyo). In order to transform ourselves into a technology-based company as stated in our 2040 Long-Term Vision, it is important to create mechanisms for making flexible organizations and people without being bound by conventional frameworks, and the purpose of this head office relocation is precisely to realize that goal. Expanding shared space, setting up places where people can greater interact with technology, and promoting communication among employees—these are just a few examples of our goals. With these intentions in mind, a variety of mechanisms have been set up at the new head office.



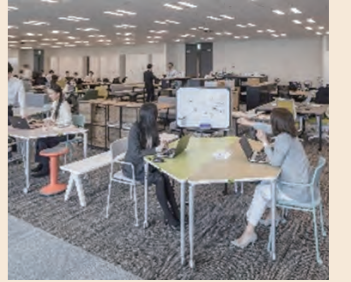
Three Concepts at the Head Office

Increase Productivity

Increasing individual autonomy and, by extension, the productivity of the entire organization by introducing ABW^{*1}, using advanced ICT tools, utilizing BPO^{*2} services, etc.

<Openness in Discussion and Focus on our Core Work>

- Layout configuration that encourages meetings and work in open, rather than confined, spaces
- Establishing the Concierge Counter^{*3} to create an environment in which employees can focus on their core work
- Smartphones equipped with business applications are provided to support location-independent work styles



Greater Interaction with Technology

Increasing sensitivity to new value creation by presenting the organization to visitors in a way that exposes them to the changing environment around the organization and industry

<Greater Interaction with Technology, Learning from History>

- Establishing a showroom equipped with panels, videos, etc. presenting business overviews and cutting-edge technologies, as well as hands-on exhibits that enable a more intuitive understanding of technical characteristics, etc.
- Establishing an event space to hold study groups for employees, share past case studies, etc.
- Unified operation of the showroom and event space under the SQUARE LAB name



More Interpersonal Connections

The penetration of ABW will naturally increase opportunities for employee interactions between various departments, creating the foundation for flexible response to major changes in the organization and business format, etc. In addition, we began operating the Group Portal Site to contribute to Group-wide optimization by fostering a sense of unity and improving productivity not only at the head office but also among Group members, and promoting the deployment of ICT tools such as digital signage, electronic approval, and business card management systems at each operating site

<Knowing People>

- Installing free coffee machines in the lounge, designing the space for people to mingle and interact during the 50-second wait for the beans to be ground and brewed, creating natural greetings and small talk
- Introducing the *Choinomi*^{*4} free drink system to promote cross-departmental interaction



VOICE

Comments from an Administration Staffer

With our relocation in 2020, we have made significant changes to our office. At the beginning of the relocation, many employees expressed confusion about the new working style and facilities, but through the support of our concierge counter teammates, they became accustomed to the new environment and found it easier to work there than ever before. Two years after the relocation, office improvement efforts are still ongoing on a daily basis. Especially with regard to facilities, we have reflected employee opinions and social changes, installing private booths, adding decorative plants, and revising the layout. The office as it is today is not in its final form, and we will continue to make improvements in order to create an office worth coming to.



JX Nippon Mining & Metals Corporation
Administration Department
Yumoto Teppei

*1 Activity-Based Working (ABW): A way of working that eliminates fixed seating and allows workers to choose where they work based on the nature of their work

*2 Business Process Outsourcing (BPO): Outsourcing office-related operations (high-volume printing, equipment management, systems consultation, travel arrangements, external warehouse management, etc.) to outside vendors

*3 Concierge Counter: A place with BPOs always on hand to help employees deal with any difficulties they may have

*4 *Choinomi*: A program offering a free drink, including alcohol, for groups of two or more employees after 3:00 p.m. (after working hours) to stimulate communication

Materiality 4 Respect Human Rights

The JX Nippon Mining & Metals Group sees maintaining sound business practices while respecting the human rights of local residents, customers, employees, business partners and all others involved in the supply chain as a major premise for our continued operation. Based on this belief, we aim to conduct our business with due consideration for human rights, using opportunities like briefings and interviews, and to create a corporate climate where human rights are respected.



KPIs and Progress

Assessment: 😊 Achieved / Steady Progress ☹️ Not Achieved

KPI	Fiscal 2021 Results/Progress	Assessment
Percentage of employees taking human rights training (100% in fiscal 2021)	In addition to stipulating respect for human rights in the Group Code of Conduct and other internal rules, we continue to carry out human rights training and e-learning programs at Group companies to raise awareness of human rights and prevent human rights violations. In fiscal 2021, 100% of officers and employees participated in our ongoing human rights training programs.	😊
Conduct survey of human rights in supply chains	We have established and operate a supply chain due diligence management system in accordance with OECD guidance for procurement of raw materials. In fiscal 2021, we underwent external audits related to gold, silver, and tantalum, as well as new external audits for platinum and palladium. These audits determined that we were taking appropriate action. We also conducted a CSR Questionnaire of suppliers at the Caserones Copper Mine in Chile.	😊

Respect Human Rights Principles

The Group is committed to advancing human rights due diligence and addressing human rights issues in accordance with internationally-recognized guidance and the fundamental principles of the International Council on Mining and Metals (ICMM), and in keeping with the intent of the RBA Code of Conduct.

Initiatives for Human Rights in the Supply Chain

In accordance with the Basic Policy on Procurement, the Group conducts checks with its suppliers about issues such as ensuring worker rights, the presence of discrimination in hiring and work, forced labor and child labor, and compliance with prohibition against purchasing conflict minerals. In addition, from fiscal 2019, we launched the CSR Purchasing Questionnaire

Surveys to ensure that our entire supply chain practices respect for human rights, occupational health and safety, compliance, environmental conservation, and other initiatives to fulfill our social responsibilities.

In fiscal 2021, we conducted a CSR Procurement Questionnaire for 17 overseas suppliers. We provide feedback to our suppliers based on the results of this survey, taking care to prevent infringements of human rights in our supply chain.

JX Nippon Mining & Metals Group Basic Policy on Procurement (excerpt)

- Follow the below principles regarding conflict minerals
 - Do not engage in raw materials procurement that contributes to illegal activities in conflict-affected regions or to human rights violations resulting from such activities.
 - Respect the guidance of the Organisation for Economic Co-operation and Development (OECD) related to raw materials procurement from conflict-affected areas, and control supply chains in an appropriate manner.

Policy for Selecting Procurement Partners

In the conduct of the JX Nippon Mining & Metals Group's business operations, it is necessary for not only the Group but also our business partners' supply chains to fulfill their responsibility to society. Therefore, we also require our business partners to operate in accordance with the items below. Going forward, we will confirm the process of improvement with respect to business partners who violate the items below and receive an adverse disposition from the government, and business partners revealed not to be complying with the items below. Furthermore, in the case that a business partner is not complying with the items below, we will consider whether it is necessary to review (or cancel) the contract with the business partner.

- Comply with laws, regulations, and social norms, such as those below, and place priority on human rights and environmental impact. In the event of any inconsistencies between internationally-recognized human rights principles and the laws, regulations, social norms, etc., respect the international human rights principles.
 - Obey laws and regulations related to manufacturing and sales, etc.
 - Abide by laws and regulations related to safety and health and develop a proper labor environment
 - Prohibit discrimination based on race, gender, etc. and respect the human rights, personality, and individuality of employees
 - Prohibit bribery and other unfair conduct
 - Preclude all relations with "antisocial forces" (the term used to refer to organized crime groups in Japan)
 - Comply with labor-related laws and regulations
 - Prohibit child labor and forced labor
 - Comply with environmental laws and regulations
 - Do not engage in conflict minerals procurement or use that contributes to inhumane acts
- Engage in sound and fair business management.
- Based on the JX Nippon Mining & Metals Group's Green Purchasing Guideline, build environmental management systems and properly manage specified chemical substances.
- Offer stable supply capacity and satisfy the quality, price, delivery, and service requirements of the JX Nippon Mining & Metals Group.
- Possess technological capabilities that meet the requirements of the JX Nippon Mining & Metals Group.

Underwent VAP Audit by RBA*

In order to appropriately address increasing corporate social responsibility and demands from client companies, the Group is actively pursuing initiatives in line with international standards. In fiscal 2019, the RBA's Validated Audit Process (VAP) audit was conducted at the Chigasaki Plant of Toho Titanium Co., Ltd. and at the Mito Plant of TANIJOBIS Japan Co., Ltd. It was also conducted at Isohara Works in fiscal 2020.

The RBA VAP audit is an assessment of maintenance and compliance with standards and management systems related to labor, safety, health, environment, and ethics, in accordance with the RBA Code of Conduct. This audit's assessment resulted in acquiring Platinum status, the highest in the RBA certification program, for Isohara Works and the Chigasaki Plant of Toho Titanium Co., Ltd. Going forward, we will explore expanding the number of sites subject to audits and, by undergoing audits and implementing PDCA (Plan-Do-Check-Act) cycles to continuously improve our performance, we will contribute to the realization of a sustainable society throughout the global supply chain.

* Responsible Business Alliance (RBA)
A business alliance created with the goal of realizing responsible behavior in the electronics industry supply chain. This organization establishes standards to ensure safe working environments, dignity and respect in worker treatment, and responsible business activities vis-a-vis the environment.



RBA-issued VAP audit certificates
(Left) Isohara Works, (Right) Chigasaki Plant of Toho Titanium Co., Ltd.

Began Procedures to Obtain Copper Mark* Certification

In March 2022, JX Metals Smelting Co., Ltd. began procedures to obtain Copper Mark certification for its Saganoseki Smelter & Refinery and Hitachi Works. Both sites play a role in producing raw materials used in our advanced materials, which are indispensable for the development of society. They are also promoting Green Hybrid Smelting that boasts an even higher ratio of recycled raw materials and introduction of CO₂-free electricity to reduce energy consumption and make effective use of resources. With the acquisition of Copper Mark certification, we will further promote initiatives related to responsible production at both sites.

* Copper Mark
A framework established by the International Copper Association (ICA) in 2019 to demonstrate the copper industry's contribution to responsible production and the SDGs created by the United Nations. Copper Mark certification is based on an independent, third-party assessment of compliance with environmental, human rights, community, and governance standards. Evaluations are conducted by an independent third-party organization, and after certification, an evaluation of the target's achievements is conducted every three years.

Confronting the Problem of Conflict Minerals

"Conflict minerals" is the general term for minerals that are mined (illegally, in most cases) in conflict-affected regions, providing a source of funds for local armed groups. The use of these minerals may lead to increasing human rights abuses and inhumane acts. In response to the international trend for stronger information disclosure and monitoring by stakeholders, industry organizations relevant to the Group (including the LBMA^{*1}, LPPM^{*2}, and RBA) have established monitoring programs for eliminating conflict minerals, and require each business operator to undergo investigations and external audits.

^{*1} London Bullion Market Association (LBMA)
An industry association composed of financial institutions and others that deal in gold and silver ingot. Inclusion on this association's Good Delivery List is viewed as a guarantee of high quality and reliability.
^{*2} London Platinum and Palladium Market (LPPM)
An industry association composed of financial institutions and others that deal in platinum and palladium ingot. Inclusion on this association's Good Delivery List is viewed as a guarantee of high quality and reliability.

Initiatives in the Gold, Silver, Platinum, and Palladium Supply Chains

JX Metal Smelting Co., Ltd., as a producer of gold, silver, platinum, and palladium ingots, has established and operates a management system for supply chain due diligence that calls confirmation of the origin of raw materials, risk assessments, and confirmation of distribution routes. Operational status is reported to the LBMA and LPPM after undergoing an external audit by a third-party organization designated by the association. As a result of these processes, the LBMA has included gold

ingots produced at the Saganoseki Smelter & Refinery of JX Metal Smelting Co., Ltd. and silver ingots produced at the Company's Hitachi Works on its Good Delivery List. At the same time, they have been included on the RMAP Conformant Smelters list for gold compiled by the RBA and GeSI* — recognition that they are taking proper measures to exclude conflict minerals.

* GeSI: Global e-Sustainability Initiative
A global trade association of information and communications businesses focused on achieving digital sustainability



LBMA and LPPM-issued external audit certificates

Initiatives for the Tantalum Supply Chain

TANIOBIS GmbH, a producer of tantalum powder, implements a strict program of purchasing checks based on international standards for procuring raw materials from conflict-affected and high-risk areas. For example, it purchases materials guaranteed by the ITSCI* to have no involvement in infringements of human rights, and it conducts supply chain due diligence. As a result of these efforts, TANIOBIS has been included in the RMAP Conformant Smelters list in recognition of its appropriate measures taken to exclude conflict minerals.

In addition, as of fiscal 2019, TANIOBIS began use of a supply chain due diligence system similar to the ITSCI, by means of the Better Sourcing Program (BSP) provided by the RCS Global Group, an international auditing organization for the raw materials supply chain.

* ITRI Tin Supply Chain Initiative (ITSCI)
An initiative by the International Tin Research Institute (ITRI), a global industry group for tin. Based on OECD Due Diligence Guidance, it works to enable due diligence from mines to smelters, and to encourage procurement from mines in conflict-affected areas that is free of involvement with local armed groups.

Initiatives for Local Residents

Development and operation of mines can have a particularly significant impact on the surrounding environment. It is therefore essential to pay due consideration to the human rights of local residents. SCM Minera Lumina Copper Chile, the operator of the Caserones Copper Mine, applies a basic three-point policy for supporting local communities: respect for the lifestyles of local residents, protection of the community and environment, and respect for applicable laws. In keeping with this policy, since the launch of this project in 2007, the operator has held briefings and engaged in dialogue with the Collas, indigenous people living in the area around the mine site, endeavoring to build trust. As in earlier years, we found no violations of the rights of local residents in fiscal 2021.



Briefing session for residents

White Logistics Activities

At the end of April 2020, we announced our participation in the *White Logistics* movement launched by the Japanese government. We are promoting activities to resolve various issues based on our voluntary declaration of support for this movement. For example, in contracts with logistics providers, we are promoting appropriate action for contract reviews, such as separating driving from ancillary work, studying and introducing fuel surcharges, and reaffirming compliance with labor-related laws and regulations and trucking business-related laws and regulations.

Activity Content in our Voluntary Declaration of Support

Activities	
1	Making suggestions and cooperating in logistics improvements
2	Separating driving from ancillary work
3	Studying modal shifts for CO ₂ reduction
4	Establishing fuel surcharge agreements
5	Incorporating legal compliance considerations when selecting contracting parties
6	Taking safety measures during loading and unloading
7	Cancelling/suspending service during abnormal weather, etc.

TOPICS

Reinforced Sulfuric Acid Transportation in Hokkaido

In August 2021, we acquired a 34% stake in Hokuho Unyu Co., Ltd. (Tomakomai City, Hokkaido), a liquid transportation company and wholly-owned subsidiary of Maruwn Corporation. Hokuho Unyu is responsible for the transportation of sulfuric acid handled by the JX Group in the Hokkaido region, and we intend to further strengthen our transportation infrastructure through this investment.

In the copper smelting process, our Group produces sulfuric acid from the sulfur contained in copper concentrates. Sulfuric acid is used in a wide range of fields, including industrial and agricultural applications.

Human Rights Education and Internal Awareness Raising

The Group provides and makes known guidelines on human rights issues including discrimination, harassment, forced labor, and child labor, for the prevention of these issues. We also create opportunities for periodic training to ensure retention of human rights awareness.

JX Nippon Mining & Metals Group Compliance Regulation (excerpt)

Prohibition of unjust discrimination

JX Nippon Mining & Metals Group companies and their officers and employees shall not discriminate in their business operations relating but not limited to hiring, salary, working hours, work conditions, and business terms due to reasons that include but are not limited to race, nationality, sex, age, religious belief, social status, or physical characteristics.

Prevention of harassment

JX Nippon Mining & Metals Group companies and their officers and employees shall work proactively to prevent sexual harassment (including gender harassment) and power harassment.

Protection of personal information

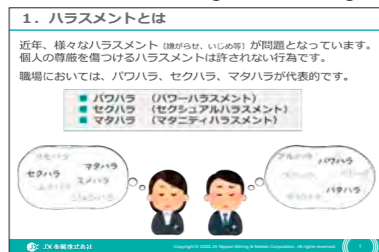
JX Nippon Mining & Metals Group companies and their officers and employees shall comply with personal information protection laws, regulations, and internal rules, adequately of parties including but not limited to customers, business partners, and employees, and in situations where personal information needs to be managed for business purposes, manage it with the utmost care.

Prevention of child labor and forced labor

JX Nippon Mining & Metals Group companies and their officers and employees shall not be involved with child labor or forced labor and shall work to help solve these issues.

Human Rights Education

We provided human rights training to all Group employees in fiscal 2021, themed on harassment prevention. This theme was established given the clear provisions in the JX Nippon Mining & Metals Group Compliance Regulation that we shall not engage in discrimination or harassment, to raise employee awareness of human rights and understanding of harassment. Based on the concept that “anyone can be a perpetrator or a victim of harassment,” the program provided a good opportunity for each participant to gain an awareness of how harassment affects both companies and employees, and to re-evaluate our own words and actions, as well as our work environment. We will continue our work to ensure an understanding of human rights concepts in our global business operations and to do business in consideration of human rights.



E-learning materials

Total Hours Spent in Human Rights E-Learning Training Fiscal 2021
(Number of trainees x course hours) **1,691 hours**

Human Rights Consultation and Remedies

The Group has established the JX Nippon Mining & Metals Group Hotline as an internal consultation service for human rights violations and other issues. Employees are able to anonymously use this hotline to discuss any issues related to human rights—from those that may crop up on a day-to-day basis to significant infringements. All reports to this hotline are presented to the president, including a report on our response to each. Information about the establishment of the hotline is posted on our intranet and disseminated through various training programs, including human rights training. No one using the hotline for consulting or reporting shall be subjected to disadvantageous treatment for its use. Eight reports were made to the hotline in fiscal 2021.

In regard to remedies, no restrictions have been made on resolving issues for consultation through external remedies, and therefore consulting parties may seek other remedies according to the legal system of the country in question.

Materiality 5 Coexistence and Co-Prosperity With Local Communities

Since the inception of our business at the Hitachi Mine, the JX Nippon Mining & Metals Group has emphasized the spirit of maintaining good relations with local communities in conducting its business. Keeping alive that spirit today, we have written coexistence and co-prosperity with society into our Code of Conduct. We additionally set an action plan for each fiscal year and work day to day to fulfill it.



KPIs and Progress

Assessment: 😊 Achieved/Steady Progress ☹️ Not Achieved

KPI	Fiscal 2021 Results/Progress	Assessment
Continuing dialogue with local communities	Despite the impact of COVID-19, we endeavored to understand the needs of local communities, building trust with stakeholders related to corporate activities through ongoing dialogue.	😊

Social Contribution Activities

With the goal of further strengthening relationships with local communities through social contribution activities, the JX Nippon Mining & Metals Group conducted community-based initiatives at each of our operating sites in Japan and overseas. While the impact of COVID-19 resulted in restrictions or limitations on our activities, we endeavored to create opportunities for communication with local communities, valuing the spirit of coexistence and co-prosperity that we have pursued since our founding.

Results of Main Social Contribution Activities in Fiscal 2021

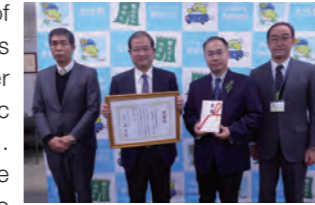
	Activity	Location	Date	Description
Environmental Conservation Activities	Cleanup around plant areas	Various group locations	Year-round	Cleanup activities on roads and local river basins surrounding our plants
	Participated in cleanup activities around the Miyata River	Hitachi Works	June and October 2021	Participated in cleanup activities organized by a local resident-led association for cleaning up the Miyata River. A total of 320 people participated in two sessions
Educational Activities	Plant tours	Various group locations	Year-round	Organized plant tours for area students (elementary, junior high, and high school), explaining plant facilities and the nature of the work performed
	Internships	Various group locations	Year-round	Internships for industrial high school, technical college, and university students; practical training and presentations
	Held educational programs for the hearing impaired	SCM Minera Lumina Copper Chile	July 2021	Held an educational program for the hearing impaired living in the surrounding areas, helping them to obtain a driver's license
	Held the Rikochallenge (science and engineering challenge)	Kurami Works, Saganoseki Smelter & Refinery, JX Metals Smelting Co., Ltd.	August 2021	Held plant tours, experiments on the characteristics of copper, and interactions with science and engineering employees for junior high students (→ Page 69)

	Activity	Location	Date	Description
Educational Activities	Job skills training	SCM Minera Lumina Copper Chile	January 2022	Job skills training for residents of Tierra Amarilla in seven courses, including nursing, caregiving, sewing, cooking, welding techniques (approximately 180 participants)
	Held an event in collaboration with the Shiba Regional City Office in Minato City	Head Office	February 2022	Held the Getting to Know the Copper Around Us program as a social science field trip program for elementary school students (→ Page 69)
Community Development	Film festival	Frankfurt Office	May 2021	Screened <i>A Town and a Tall Chimney</i> at Nippon Connection, the Japanese Film Festival in Germany
	Participated in Kurobe Fair 2021	JX Nippon Mikkaichi Recycle Co., Ltd.	September 2021	Set up an online company booth to introduce our business at a regional industrial event hosted by Kurobe City
	Covered security camera installation costs	Saganoseki Smelter & Refinery, JX Metals Smelting Co., Ltd.	December 2021	Covered a portion of the costs for a nearby neighborhood association installing security cameras. Received a letter of appreciation from Oita Prefecture
	Participation in Christmas event	SCM Minera Lumina Copper Chile	December 2021	Distributed 3,400 Christmas gifts to children in schools and kindergartens, as well as to senior citizen groups and neighborhood associations in Copiapó Province
	Sales event for local crafts	SCM Minera Lumina Copper Chile	December 2021	Held a sales event for local crafts such as textiles, leather goods, herbal products, jewelry at the Caserones Copper Mine cafeteria
Donations to Local Communities	Donations to and sponsorship of local festivals and events	Various group locations	Year-round	Provided donations to and sponsored local festivals, fundraisers, fireworks displays and other events
	Donated plastic bottle caps, used stamps	JX Nippon Exploration and Development Co., Ltd., JX Metals Trading Co., Ltd.	Year-round	Collected and donated plastic bottle caps and used stamps
	Donations to the fire department	TANIOBIS GmbH	2021	Provided donations to the local fire department where the plant is located. The money was used to purchase weather sensors
	Donations for train derailment victims	Nikko Metals Taiwan Co., Ltd.	April 2021	Provided donations to the victims of the Taroko Express train derailment
	Donations of vending machine sales	Saganoseki Smelter & Refinery, JX Metals Smelting Co., Ltd.	January 2022	Provided donations of a portion of the proceeds from vending machines on the premises to a traffic accident orphans relief fund. Received a letter of appreciation from Oita Prefecture
Sports Promotion	Collaboration with Mito HollyHock	Head Office	From April 2022	Concluded an official partner agreement (→ Page 72)
	Kendo Club becomes a Corporate Sport	Head Office, etc.	From April 2022	Strengthening the activities of the Kendo Club as a corporate sport going forward

Activity Highlights

● Donations to a Traffic Accident Orphans Relief Fund Saganoseki Smelter & Refinery, JX Metals Smelting Co., Ltd.

For a number of years, we have donated a portion of the proceeds from vending machines installed on the premises of the Saganoseki Smelter & Refinery to a traffic accident orphans relief fund operated by Oita Prefecture. This relief and support fund provides various grants to help children orphaned by traffic accidents, in the hope that they will grow up healthy and strong. The Saganoseki Smelter & Refinery also engages in a wide range of traffic safety activities, including raising awareness of traffic safety among employees through education and other means, and supporting traffic safety promotion groups. Through these activities, we will continue to contribute to local communities.



Receiving a letter of appreciation from Oita Prefecture

● Support Program for People with Disabilities Near Caserones SCM Minera Lumina Copper Chile

As part of our community contribution activities, we held a driver

training program for nearby residents with hearing impairments to obtain their driver's licenses. This training program was the first of its kind in northern Chile. A total of 21 people with hearing impairments participated in the program and completed 100 hours of training.



Participants in the driver's license training program

Contributing to Local Employment

As a global business enterprise, we believe that contributing to the development of local economies and communities through local employment plays an important role in building good relationships with local communities. The ratio of senior managers among locally hired employees at important overseas locations is 8.9% for men and 12.8% for women.

TOPICS

Launched the Kendo Club as a Corporate Sport

In April 2022, we designated the Kendo Club as a corporate sport in strengthening its activities. Kendo is a sport that we have been involved in for many years since the founding of the Hitachi Mine (Hitachi City, Ibaraki Prefecture), and it continues to be an in-house club activity. In order to position this historical kendo club as a corporate sport and to significantly strengthen the club's activity system, we have invited Ishida Toshiya, one of the greatest kendo instructors in Japan and a kendo instructor with the highest possible rank of hanshi 8th dan, to serve as the club's instructor. This is aimed at building a strong team that can compete in the All Japan Businessman's Kendo Championship. In addition, in order to actively contribute to society through kendo, we have secured a dedicated kendo hall in the vicinity of our head office as a venue for its activities, and will make effective use of it to support local sports and other activities.

Alongside strengthening the Kendo Club, we will actively promote efforts to contribute to the community and cultivate the next generation through sports, including support for community-based sports activities.



Kendo hall completed in September 2022

VOICE

Comments from Ishida Toshiya, Kendo Club Instructor

After retiring from the National Police Academy, I struck out on a new path as instructor of the historic JX Nippon Mining & Metals Kendo Club. I strongly agree with the Company's policy of strengthening the Kendo Club as a corporate sport and contributing to society through kendo. To help achieve this goal, I will do everything in my power to bring together all parties concerned, both internally and externally, while cherishing the bonds that are built through kendo.



Kendo Club Instructor Ishida Toshiya

*Pictured in the front row, fourth from the left

Community Development



Exhibition and sales event for local crafts held at a cafeteria

Donations to Local Communities



Children enjoying their Christmas gifts

Sports Promotion



Mito HollyHock

Activities Related to COVID-19

Activities to Protect Employees and Their Families

We newly established a special leave system to return to Japan for expatriates stationed at overseas bases of the Company and their accompanying family members, helping them to reduce stress caused by the COVID-19 pandemic and to receive vaccinations in Japan. So far, a cumulative total of around 50 employees and family members have utilized this system.

Workplace vaccinations were administered up to the third shot at the head office and several operating sites, not only to employees and their families, but also to employees of subcontractors and neighboring companies as we expanded the scope of this program.

The Hitachi Works donated one ultra-low temperature freezer, enabling ultra-low temperature storage of vaccines, to Hitachi City. This freezer is used to store vaccines at a medical institution located in the city.

Hoping that COVID-19's spread will be brought under control as soon as possible, we will continue to engage in support activities both internally and externally.



The ultra-low temperature freezer provided for this project and its being unloaded

Participation in the IP Open Access Declaration Against COVID-19

In June 2020, JX Nippon Mining & Metals Corporation endorsed the purpose of and participated in the IP Open Access Declaration Against COVID-19 to support the fight against COVID-19. Under this declaration, companies promise to not exercise patent rights, utility model rights, design rights, or copyrights against any entity using said rights for the purpose of ending the spread of COVID-19. An announcement was made in May

2022, following the one in June 2021, to extend the term of the declaration in light of the ongoing pandemic.



WEB Participation in the IP Open Access Declaration Against COVID-19 (Japanese only)

<https://www.gckyo.com/covid19>



Donation of COVID-19 Prevention Equipment to Local Communities (Chile)

In February 2022, SCM Minera Lumina Copper Chile, the operator of the Caserones Copper Mine, donated 2,000 simple antigen test kits for COVID-19 to the Atacama Health Department in response to the resurgence of COVID-19 in Chile. In response to this donation, The director of Atacama Health Service, Claudio Baeza, expressed his appreciation for the company's continued support during the pandemic.



COVID-19 test kits donated to Atacama Health Service

Stakeholder Engagement

The Group believes that understanding the demands of various stakeholders accurately, responding in good faith, and building relationships of trust will lead to an increase in corporate value. To this end, we take advantage of opportunities for dialogue with each stakeholder and engage in active two-way communications.

Key Stakeholders and Responsibilities	Main Means of Communication	Main Topics
Customers We will contribute to achieving a more affluent society by improving satisfaction and fulfilling our social responsibilities through the stable and efficient supply of high-quality products.	<ul style="list-style-type: none"> • Communication in sales activities • Dissemination of information via website and SNS • Exhibited at the 8th Highly-functional Metal Expo • Invitation to SQUARE LAB 	<ul style="list-style-type: none"> • Stable supply of highly-functional products • Improve economic efficiency and added value of products • Improve environmental performance of products • Appropriate disclosure of product information
Shareholders and investors As a major operating company of the ENEOS Group, we will strive to disclose information in a timely and appropriate manner through ENEOS Holdings, a listed company.	<ul style="list-style-type: none"> • Publication of Sustainability Report • Disclosure of information on website • IR news email distribution • General meeting of shareholders, financial results briefing, business office information 	<ul style="list-style-type: none"> • Stable profit return • Easy-to-understand information disclosure on management strategies • Full disclosure of ESG information
Employees We will promote the creation of a rewarding workplace, focusing on the improvement of the work environment and the enhancement of training systems. And we will strive to improve the motivation of each individual.	<ul style="list-style-type: none"> • Publication of the group newsletter Cuprum • Preparation and distribution of the <i>ESG Handbook</i> and the <i>Handbook for Supporting Balancing Childcare or Nursing Care</i> • Implementation of self-assessment system • Hold online workshops • Dialogue between labor unions and management • Prevention of occupational accidents 	<ul style="list-style-type: none"> • Creation of diverse work styles • Penetration of Group ESG activities • Achieving diverse work styles • Enhancement of training system • Fair and equitable personnel evaluation • Maintaining and promoting mental and physical health
Business partners We will conduct business with our partners built on relationships of trust. We are working to achieve fair and equitable transactions throughout the supply chain.	<ul style="list-style-type: none"> • Communication through purchasing activities (CSR Procurement Questionnaire) • Operation of an inquiry desk • Conducting surveys with business partners • Invitation to SQUARE LAB 	<ul style="list-style-type: none"> • Equal and fair trade • Management of occupational safety
Local communities We will pursue coexistence and co-prosperity at each of our bases by creating understanding of our business and building cooperative relationships through various exchange opportunities.	<ul style="list-style-type: none"> • Creation of cooperation agreements with universities and establishment of joint research courses • Conducting factory tours, office tours, and visiting classes • Participation in and sponsorship of community events • Conduct briefings for local residents • Participation in local volunteer activities 	<ul style="list-style-type: none"> • Strengthening cooperation with local communities for their revitalization • Cultivation of a new generation and educational support • Reduce the environmental impact of the region
International community We pay close attention to trends in global warming and other international issues. We engage with issues proactively and comply with laws and regulations.	<ul style="list-style-type: none"> • Implement business practices that support the SDGs • Engage in activities as an ICMM member company • Agreement with and support for EITI • Response to TCFD / Endorsement of Challenge Zero / Response to CDP / Participation in WIPO GREEN / Response to the RBA Code of Conduct 	<ul style="list-style-type: none"> • Establishment of a resource-recycling society • Climate change adaptation and mitigation • Progress in the Digital Society

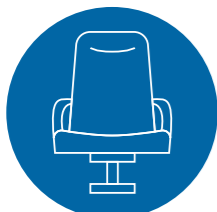


Governance

Materiality 6 Strengthen Governance

It is essential for companies to gain and maintain stakeholder trust to conduct business and increase long-term corporate value in a drastically changing society. The Group promotes strict compliance with laws and risk management to increase the soundness and transparency of management and reinforce governance.

Corporate Governance



▶ P100

Rigorous Compliance



▶ P101

Risk Management



▶ P103

Quality Control in the Supply Chain



▶ P106

KPIs and Progress

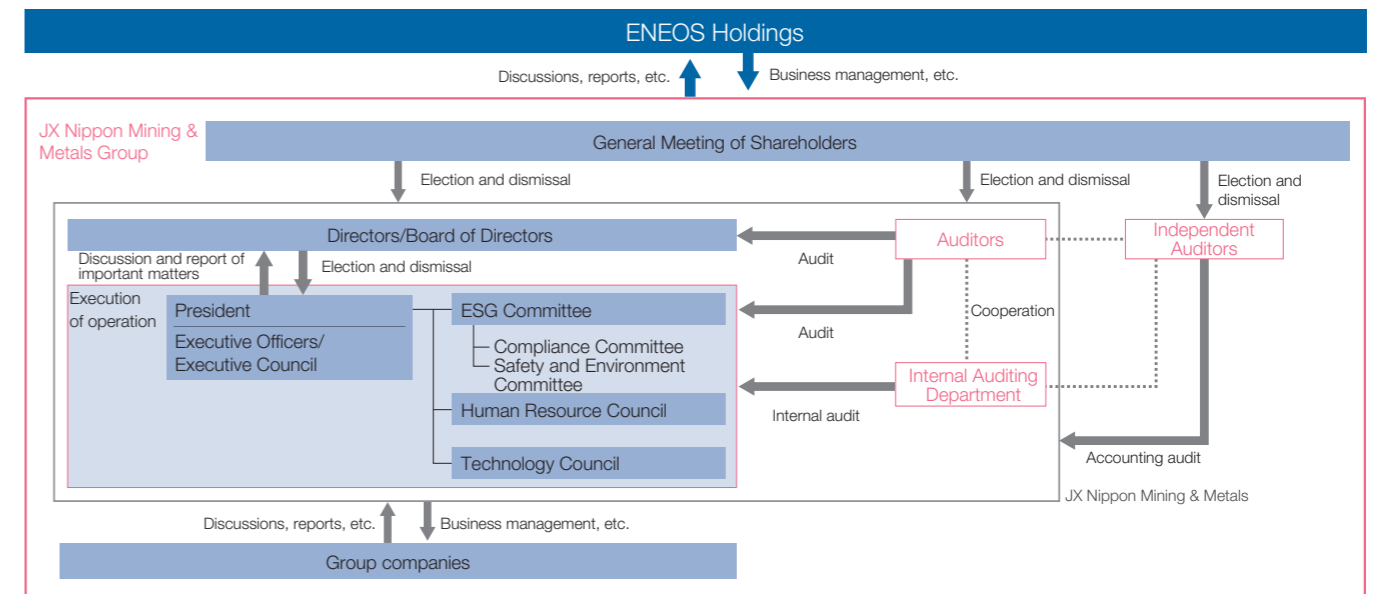
Assessment: 😊 Achieved/Steady Progress ☹️ Not Achieved

KPI	Fiscal 2021 Results/Progress	Assessment
Steady operation of Enterprise Risk Management (ERM)	The Group bases its activities in ERM concepts with reference to ISO 31000, a set of guidelines for risk management methods. In fiscal 2021, an external organization evaluated the ERM system and the status of its operations, and improvements were implemented to address the issues that were identified.	😊
Compliance training tailored to business characteristics and social movements, etc.	The Group conducts compliance training every year to increase awareness and knowledge of compliance among executives and other employees. In fiscal 2021, in addition to annual the rank-specific compliance training, which is conducted every year, we held training programs in Japan and overseas regarding harassment and the Subcontract Act, tailored to business characteristics and social trends, and other factors.	😊

Corporate Governance

The Group is working to strengthen its governance structure in order to have a firm grasp on rapidly changing business environments, to accelerate decision-making and business execution, and to achieve fair and highly transparent management.

Corporate Governance Structure



● Board of Directors

The Board of Directors was established to discuss matters specified by laws, regulations, and the Articles of Incorporation, as well as other important management issues. The Board of Directors is composed of the president and seven directors (as of June 2022) (six male directors, one female director). Auditors can also attend the meeting and express their opinions. In accordance with laws, regulations, and the rules of the Board of Directors, transactions involving conflicts of interest between directors and the Company are subject to approval by the Board of Directors.

● Executive Council

As an advisory organ to the president, the Executive Council was established to discuss important matters regarding company management and to report the state of business execution. The Executive Council is composed of the president and executive officers designated by the President. Full-time Auditors can also attend the council meeting and express their opinions.

● Executive Officer Compensation System

Company compensation for the executives consists of fixed monthly compensation based on the relevant individual's role, and variable performance-based bonus payments. The bonus is determined by the consolidated business results of the Company as well as ENEOS Holdings. The Company does not have an executive officer retirement benefit program. The share-based payment system was implemented in July 2017. The share-based payment system applies the Board Incentive Plan (BIP) to Board Members, etc. to provide ENEOS Holdings shares according to individual role and performance as part of the incentives program.

● Auditors

Auditors attend Board of Directors meetings, Executive Council meetings and other important meetings of the Company to express their opinions as needed to increase the effectiveness of audits. In addition, auditors endeavor to understand the state of business execution by individual executives of the Company and the Group companies, through interviews, and through the inspection of documents. Furthermore, auditors also receive periodic reports on audit plans, progress, and results from the Internal Auditing Department and the accounting auditor while enhancing cooperation through the exchange of information and opinions.

● **Outside Director**

With the recent growing calls from society to strength governance and internal controls, we appointed new outside directors in both April and June of 2022 in order to incorporate new perspectives in judgement and new stimuli. As well as provide an external oversight function. As of June 2022, three out of seven directors are outside directors.

● **Management of Group Companies**

Each Group company is placed under the jurisdiction of the appropriate operating or corporate department of the Company based on its business line, and the execution of its operations is managed and supervised by that department. Important matters regarding the business management of individual Group companies are reported to the Company through the relevant supervising departments. If necessary, they are also reported or discussed at the Executive Council and other important meetings.

Internal Control System

The Group has established the Basic Policy for Establishment and Operation of Internal Control Systems and based on this policy, the Group has established internal control systems to ensure the efficiency and appropriateness of its operations. In addition to receiving reports on the status of internal control

activities from each division of the Company, we conducted a survey of the status of development and operation of internal control systems at major Group companies. The status of the development and operation of internal control systems is, in principle, monitored once a year by the Executive Council. While taking into consideration the business characteristics of each company, we are continuously improving internal control systems for the Group as a whole.

Internal Audit

We conduct internal audits across the entire JX Nippon Mining & Metals Group to investigate, discuss, and assess the state of business administration, operations, and asset preservation from the standpoints of legality, efficiency, and effectiveness. The Internal Auditing Department is in charge of these functions.

The Internal Auditing Department establishes a medium-term policy at three-year intervals and drafts auditing plans for each fiscal year to ensure systematic internal audits. Internal audits of Group companies are conducted in collaboration and cooperation with auditors dispatched from the Company. Based on the results of these audits, proposals for necessary improvements are made, with progress tracked for corresponding actions. Audit results and findings are reported to the president of JX Nippon Mining & Metals, to the relevant Group company, and, as necessary, to the Executive Council.

Rigorous Compliance

The JX Nippon Mining & Metals Group Code of Conduct and the JX Nippon Mining & Metals Group Compliance Regulations define compliance as not only observing domestic and foreign laws, rules, and regulations, but also acting in line with social norms and corporate ethics. We conduct our corporate activities with an emphasis on compliance. Based on the belief that thorough compliance is a prerequisite, the Group, as a member of the community, continues to create value in response to the expectations of its diverse stakeholders, and we have established various internal regulations concerning compliance. At the same time, we have established Compliance Priority Targets for each fiscal year and monitor the real-time status of their implementation. If any issues are identified in the system or in operations, we make improvements as we continue various efforts that will enable us to remain a trusted corporate group.

Compliance Promotion Structure

Measures related to compliance in the Group are determined at Compliance Committee meetings (twice yearly in principle). The Committee consists of executives from the Company and other major Group companies in and outside Japan. In response to reports on the state of compliance provided by individual de-

partments of the Company and Group companies, the Compliance Committee evaluates the risk of fraudulent acts, legal violations, and other misconduct related to business operations, and reflects the results in setting priority issues and formulating education plans.

Whistleblower Program

To increase reliability, we have outsourced the Group's whistleblower program to an external organization. This external organization is responsible for accepting anonymous reports from whistleblowers. We have also taken a wide range of measures to increase awareness of the program throughout the Group. Such measures include displaying posters at individual Group company sites to publicize the program, posting articles in pocket editions of the Group Philosophy, which is distributed to all employees, opening a special section on the Company intranet, and introducing the program during compliance education sessions. In fiscal 2021, we received several reports through the program and took necessary measures in all instances in accordance with the relevant rules and regulations while taking due care to protect whistleblowers.

Handling Anti-Social Forces and Bribery Prevention

The Group has established a system for eliminating anti-social forces based on the JX Nippon Mining & Metals Group Regulations for Dealing with Anti-social Forces and the JX Nippon Mining & Metals Group Detailed Rules for Dealing with Anti-social Forces in order to cut off any relationship with anti-social forces. This system includes periodically conducting specified investigations of business partners and their related parties, and taking contractual measures in advance to terminate business relationships, depending on the circumstances. In order to prevent violations or suspected violations of anti-bribery laws and regulations by Group company executives and employees, we have established an anti-bribery system founded on the JX Nippon Mining & Metals Group Anti-Bribery Regulation. This system includes the requirement of a prescribed set of checks when providing entertainment, gifts, etc. to a public official or similar person, and approval from a responsible party when certain conditions are met. In fiscal 2021, we continued to check application based on the regulations, and confirmed that these were generally being applied properly. (There were no adverse dispositions issued by regulators in regard to bribery.)

Program for Compliance with Competition Laws

The Group has established the Program for Compliance with Competition Laws, which includes rules such as those requiring all employees to report in advance planned transactions or gatherings with competitors to confirm that they do not violate competition laws, requiring individual managers to submit periodic reports to the head office, and so on. In fiscal 2021, we continued to check application based on the aforementioned program, and confirmed that these were generally being applied properly. (There were no adverse dispositions issued by regulators in regard to anti-competitive behavior.)

Complete Inspections for Compliance With Environment and Safety Laws

We conducted complete inspections for compliance with environment and safety laws at 2 Group sites in fiscal 2021. We confirmed that environment-related and occupational health and safety-related laws were thoroughly understood by employees at all Group company sites and no serious lack of understanding was observed. All sites are also responding appropriately to matters requiring improvement.

Inspections for Compliance With Labor Laws

We conducted inspections for compliance with personnel and labor laws at eight Group sites in fiscal 2021 and confirmed that they were properly managed.

Compliance Education

The Group facilitates the fulfillment of compliance education to increase awareness and knowledge of compliance among executives and other employees, and conducts a variety of compliance and legal training sessions in Japan and, overseas based on business characteristics and social trends.

In fiscal 2021, in addition to annual rank-specific compliance training (for directors, managers, new employees, etc.) that is conducted every year, training sessions on internal controls, security trade controls, harassment, the Subcontract Act, Stamp Tax Act, etc. were conducted as theme-specific legal and regulatory education sessions. At overseas bases, we conducted education for expatriates at the headquarters or the bases, taking into account business characteristics and social trends, etc. In Germany and China, lectures on the Group's compliance system and explanations of important laws and regulations, such as those dealing with competition law compliance and anti-bribery, were presented mainly to national staff managers by lawyers, legal staff, and other instructors. It was an opportunity for participants to deepen their understanding of compliance.

Going forward we plan to continue to studying and implementing compliance training programs in Japan and overseas, based on trends in legal revisions, regional characteristics, and other factors.



Compliance training for executives by Kubori Hideaki, attorney at law, Hibiya Park Law Office (Headquarters)

Tax Governance

The JX Nippon Mining & Metals Group recognizes that the proper fulfillment of tax obligations in the countries and regions where a company does business is one of the most important social responsibilities that it should fulfill. Based on this, we are fostering awareness of tax compliance and working to maintain our tax governance system in accordance with the ENEOS Group Tax Matters Policy.

Protection of Intellectual Property

The Group recognizes that intellectual property rights are important company assets and strives to protect and utilize such rights. In addition, the JX Nippon Mining & Metals Group Basic Procurement Policy clearly states that we respect the intellectual property rights of other companies and endeavor to not infringe on them. In researching and developing new products and technologies, we conduct preliminary investigations to ensure that our products do not infringe on intellectual property rights.

ENEOS Group Tax Matters Policy (Excerpt)

1. Basic Approach
Companies have a social responsibility to appropriately honor their tax obligations in the countries and areas where they conduct their business activities.
2. Compliance with Applicable Laws and Regulations
We comply with the relevant tax laws and regulations in the countries and areas in which we conduct our business activities.
We conduct our business activities in accordance with the purposes of the rules regarding international tax matters (such as the OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations and the Base Erosion and Profit Shifting Project).
3. Fostering Awareness of Tax Compliance
Through continuous training concerning tax matters and other relevant training, we make efforts to maintain and improve our awareness of tax compliance.
4. Optimization of Tax Costs
By using the Advance Pricing Arrangement and other relevant systems, we attempt to obtain agreement with tax authorities, and make efforts to reduce risks and optimize costs.
5. Establishment of Relationships of Trust with Tax Authorities
At the request of tax authorities, we timely and properly provide them with necessary information.

Risk Management

We identify, analyze, and assess various risks surrounding our business based on future projections and changes in the internal and external environment, and implement measures such as reducing, transferring, and retaking these risks. In addition, by monitoring the situation, we promote risk management in accordance with the following principles with the goal of appropriately managing risks and supporting the management of the Group.

- Management and employees will participate in risk management initiatives.
- Recognize risks linked to business goals and promote them as an organization-wide activity.
- Respond flexibly to risks, taking into account the organization's purpose, mission, and goals, as well as internal and external conditions.
- Continuous improvement based on information from stakeholders and evaluation of the effectiveness of risk management efforts.

Risk Management Promotion System

At the Group, we select Material risks, approve response plans for each material risk, and monitor these plans, all with the approval of the JX Nippon Metals & Mining Executive Council. In addition, the Risk Management Office in the Company's Administration Department is responsible for the overall risk management for both the Company and Group, handling ERM.

Status of Risk Management Initiatives

Risk is defined as "any uncertainty that may affect the management of JX Nippon Mining & Metals Group companies." Here, in order to achieve risk management that is linked to our long-term vision, medium-term management plan, and business plan, we classify risks into "management risks" and "business risks." Among those management risks and business risks, risks that we determine will have a significant impact on the Group's management, and that should be addressed on a company-wide basis, are designated as "material risks" by the Executive Council.

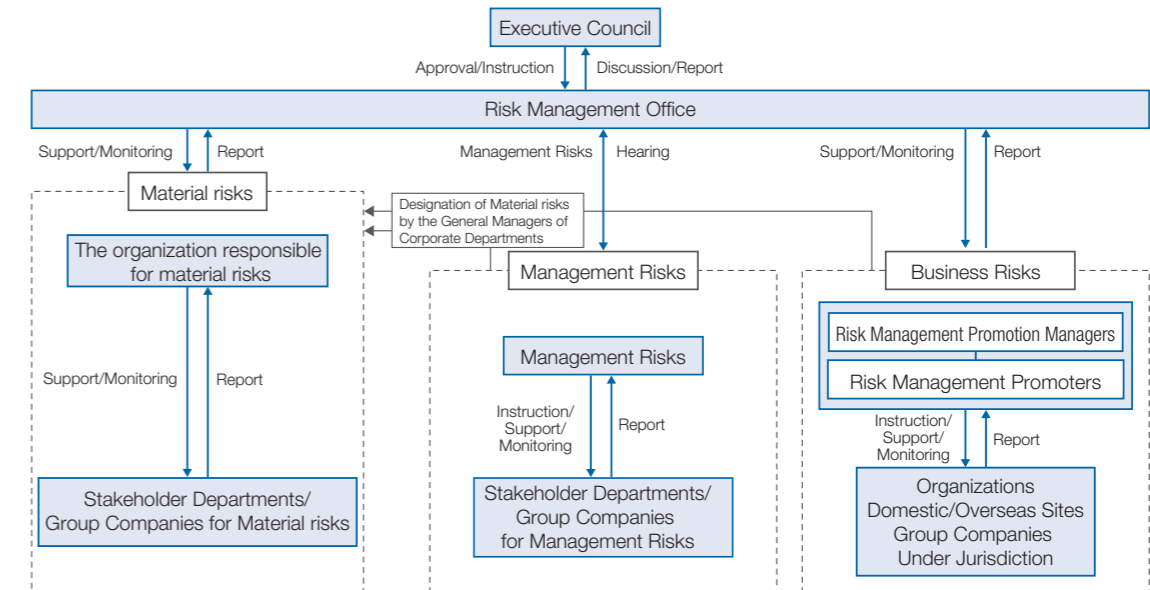
cil. These important risks include risks related to business continuity and sustainability, such as climate change and risks related to human rights. The organization responsible for material risks takes the lead in responding to these risks. In addition, the Executive Council monitors the status of these actions.

In fiscal 2021, in order to strengthen our risk management initiative, an external organization conducted an evaluation of

our ERM framework and its operational status. We have also made improvements in response to the issues identified. We will continue to take risk management initiatives as we operate PDCA cycles within this mechanism. In this process, we will evaluate the appropriateness and adequacy of our risk management system, identify issues, and make continuous improvements.

1. Management Risks
Risks that may hinder the achievement of the Group's management goals are selected by consensus from the General Managers of corporate departments.
2. Business Risks
Each department or Group company selects risks that may affect the achievement of goals related to the execution of business by the respective organization. Each organization appoints Risk Management Promotion Managers and Risk Management Promoters, with the goal of promoting the penetration of risk management activities within each organization.

Risk Management Structure



Strengthen Risk Transfer Strategies

Risk response is the assessment of risk and the selection and implementation of an appropriate response to that risk, and includes transfer, reduction, retention, or avoidance. For risks that could have a significant impact on our business activities despite our risk reduction measures, we will utilize insurance as a means of risk transfer to address the risk. The Risk Management Office has established uniform standards for insurance coverage to ensure that insurance is properly arranged and utilized. We will continue to review these standards as appropriate to ensure effective and precise risk transfer responses.

Promotion of Risk Personnel Education

With the aim of increasing risk sensitivity, the Group conducts training for those responsible for and in charge of risk management promotion. For example, we share perspectives and case studies that are necessary to properly identify risks that may affect the achievement of each organization's goals. In addition, we hold workshops on an ongoing basis to discuss measures to prevent the emergence of risks related to cross-divisional themes.



Business Continuity Plan (BCP) Initiatives

The Group has formulated business continuity plans (BCP*) to minimize damage and achieve early recovery in the event of business interruption due to a major earthquake.

From fiscal 2020, we have taken this to a higher level and have begun working toward the establishment of an all-hazard BCP called a resource-based BCP. This is not a BCP for each event such as an earthquake or a flood, but one that focuses on resources (facilities, raw materials, materials, etc.) that are likely to disrupt business activities during emergencies, and organizes relevant disaster mitigation and recovery measures. In addition, we regularly survey the risk of disasters occurring where our major business sites are located to help us make decisions about preventing damage and investing in facilities. Through these efforts, we aim to further strengthen our BCPs. We also continue to further improve our initial disaster response.

In fiscal 2021, at the head office and other sites, we (1) the establishment of a disaster control headquarters, (2) the confir-

mation of employee safety, (3) the assessment of damages both inside and outside each company, and (4) the sharing and discussing of information, and initiation of measures. The exercise was carried out without disclosing the scenario. The Group endeavors to verify BCPs through periodical training and establish a Business Continuity Management (BCM**2) system for further improvement.

*1 BCP: Business Continuity Plan
*2 BCM: Business Continuity Management



BCP training at the Head Office

VOICE

Comments From Saganoseki Smelter & Refinery Representative

Saganoseki Smelter & Refinery conducted a BCP training in October 2021, practicing improvement measures for issues that had emerged during the previous year's training and discussing facility recovery plans. This time, we conducted a training exercise conducted for a tsunami caused by an earthquake and focused on verifying whether the new rules of conduct stipulated in the BCP document could be implemented without delay. It included the evacuation of employees and vehicles to higher ground and the establishment of a first-aid station.

The Saganoseki Smelter & Refinery is located in an area adjacent to the ocean and therefore faces a high risk of experiencing earthquakes and tsunamis. We will continue to make efforts to further strengthen our BCP system to ensure a stable product supply.



JX Metals Smelting Co., Ltd.
Administration Department,
Saganoseki Smelter & Refinery
Iwai Koji

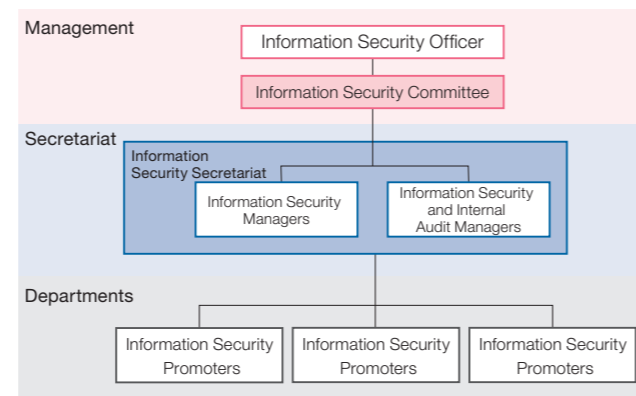
Information Security Initiatives

The Group has taken steps to build an information security management system (ISMS) in compliance with ISO 27001 from the three perspectives of strengthening information security compliance, increasing customer trust, and leveraging information internally and externally. In fiscal 2021, we conducted risk assessments and internal audits of information security in each department and made improvements based on the results of these assessments under the supervision of the Information Security Officer. We also further strengthened physical protection measures. In addition, in order to raise awareness of information security within the Group, we conducted rank-based training programs based on the newest information available, including training for members of management and training for general employees.

In upgrading information security, we will incorporate the cyber security measures implemented by the IT Department. At the same time, we will promote continuous improvement in

accordance with ISMS in order to contribute to the realization of our long-term vision of becoming a technology-based company.

Information Security Structure



JX Nippon Mining & Metals Group Basic Policy on Information Security

As a company with a social mission to provide a stable supply of nonferrous metals and advanced materials, the JX Nippon Mining & Metals Group recognizes that the information entrusted to us by our customers and business partners, as well as trade secrets and personal information held by us, are important assets. We have established a basic policy for information security in order to systematically and continuously strengthen information security.

1. Legal compliance and social responsibility
Comply with laws and regulations, government guidelines, contractual obligations, and internal rules related to information security, and work to foster compliance management and a culture that emphasizes information security.
2. Maintain and strengthen the trust we receive from customers and business partners
Ensure the protection of information assets entrusted to us by our customers and business partners.
3. Contribute to the expansion of our own business opportunities
Ensure protection of information assets that can be a source of competitive advantage.

Quality Control in the Supply Chain

The Group recognizes that its social mission is to provide a stable supply of nonferrous metals and materials in order to contribute to the sustainable development of society. Based on this policy, we aim to improve the level of quality control throughout the entire supply chain.

JX Nippon Mining & Metals Group Basic Quality Policy

The JX Nippon Mining & Metals Group hereby sets forth, and acts in observance of, this Basic Quality Policy in order to contribute to the development of a sustainable society while recognizing that its social mission is to stably supply nonferrous metals and materials.

1. Grasp the requirements of customers and society correctly in order to offer products and services that customers can trust and that satisfy their needs.
2. Improve and maintain quality in all processes from development, design, and production to delivery, while paying due attention to safety and environmental conservation.
3. Establish a quality management system, carry out continual improvements, and develop human resources.
4. Comply with all pertinent laws and regulations of Japan and other countries, and provide customers and society with accurate information on quality.

Establishing and Operating a Quality Management System

The Group has and operates a quality management system (QMS) to realize our Basic Quality Policy. We work to continually make improvements through steady PDCA cycles, aiming to realize better quality through the QMS. Company sites both in Japan and overseas have acquired QMS third-party certification (ISO 9001, etc.).

In addition, the Group reviews quality improvement activities and establishes action plans through the Quality Management

Meeting, which is made up of top management. We also hold Quality Assurance Managers' Meetings twice annually to share information on quality management. Participants share the action plans adopted at the Quality Management Meeting and share issues encountered and best practices found at each site to promote interactions among quality assurance managers. In addition, we are working to improve the effectiveness of internal quality audits, automate inspections, and strengthen the training of quality control personnel.

ESG Data Book

Manufacturing Sites With Third-Party QMS Certification

[Domestic]

Isohara Works; Kitaibaraki Precision Co., Ltd.; Kurami Works; JX Nippon Coil Center Co., Ltd. (Kurami Office, Kawasaki Office); Hitachi Works (Copper Foil Dept.); Ichinoseki Foil Manufacturing Co., Ltd.; JX Metal Smelting Co., Ltd. (Saganoseki Smelter & Refinery, Hitachi Works); Japan Copper Casting Co., Ltd. (Saganoseki Works); JX Metals Trading Co., Ltd. (Takatsuki Plant); JX Metals Precision Technology Co., Ltd. (Esashi Works, Nasu Works, Kakegawa Works); TANIOBIS Japan Co., Ltd. (Headquarters, Mito Plant); and Toho Titanium Co., Ltd. (Headquarters/Chigasaki Plant, Hitachi Plant, Yahata Plant, Wakamatsu Plant, Kurobe Plant)

[Overseas]

Nippon Mining & Metals (Suzhou) Co., Ltd.; Nikko Fuji Precision (Wuxi) Co., Ltd.; JX Nippon Mining & Metals Dongguan Co., Ltd.; Nikko Metals Taiwan Co., Ltd. (Longtan Works, Kuanyin Works); JX Nippon Mining & Metals Philippines, Inc.; JX Nippon Mining & Metals USA, Inc.; JX Nippon Mining & Metals Korea Co., Ltd.; TANIOBIS GmbH (Goslar); TANIOBIS Smelting GmbH & Co. KG (Laufenburg); TANIOBIS Co., Ltd. (Map Ta Phut); Materials Service Complex Malaysia Sdn. Bhd.; Materials Service Complex Coil Center (Thailand) Co., Ltd.; and SCM Minera Lumina Copper Chile

Quality Control Department Activities

The Quality Control Department is in charge of planning, proposal, promotion, and oversight for enhancement of Group-wide quality control. This department is also engaged in clarifying Group-wide QMS requirements, improving the effectiveness of internal quality audits, and supporting quality improvement activities and quality control education at manufacturing sites.

In fiscal 2021, we continued to remotely conduct internal quality audits at 13 sites in Japan and overseas, despite restrictions imposed by the COVID-19 pandemic.



Liability Claims

In fiscal 2021, there were no claims pursued under the Product Liability Act due to personal or property damage caused by defects in products made by Group companies.

Providing Information on Products and Services

In accordance with the Basic Quality Policy, the Group provides customers with information on its products and services through product specifications and Safety Data Sheets (SDS)*. For example, sulfuric acid sold by Group companies is designated as a deleterious substance under Japan's Poisonous and Deleterious Substances Control Act. By limiting our business partners to sellers of poisonous or deleterious substances and issuing SDSs, we strive to prevent serious negative effects on the occupational health and safety for our customers and their employees after delivery.

* A Safety Data Sheet (or SDS) is a document that provides information on chemical substances, product names, suppliers, hazards, safety precautions, and emergency responses with regard to a given chemical product.

Quality Assurance Initiatives With Suppliers

Cooperation with suppliers is essential for thorough quality assurance. The Group respond to its suppliers based on quality management standards and quality requirements. Our efforts include conducting regular evaluations and quality audits, reducing quality risks, and improving the quality level of our suppliers. We also conduct Supplier Surveys to promote mutual understanding with our suppliers.

Promotion of Personnel Quality Education

The Group ensures that all employees are thoroughly familiar with the Basic Quality Policy through quality control education. In addition, to we also provide quality control education to all employees to improve their problem identification and resolution capability, helping them to logically infer the root cause of a problem and independently resolve it and improve the quality of their work. These training programs, which range from introductory to advanced courses according to the level of the participants, have become an established part of employee training.

Starting in fiscal 2020, the Company's Quality Control Department encourages internal quality auditors to acquire qualifications such as QMS Auditor and is introducing retrospective training from outside instructors in order to improve their competence.



Quality control education (Headquarters)

Addressing the ICMM's Performance Expectations (PEs)

ICMM, of which JX Nippon Mining & Metals is a member, requires its member companies to conduct PEs*, a program to verify each company's progress in achieving the roles and results expected of the mining and metals industry. In response, the Group conducted a self-assessment of its corporate office and seven sites. The following is a summary of the assessment results.

Of the sites for which self-assessment was conducted, we

plan to undergo third-party validation at the Saganoseki Smelter & Refinery and Hitachi Works, both of JX Metals Smelting Co., Ltd., as well as the Caserones Copper Mine. This is due to their high quantitative importance in terms of elements such as business scale and production volume.

* Performance Expectations (PEs) is a program to evaluate companies' achievement of requirements in the ICMM's Mining Principles and Position Statements. Self-assessments and third-party validations are required for subject sites. Self-assessments are scored on a three-point scale: Meets, Partially Meets, and Does not Meet

Self-Assessment Analysis

Site	Results				Total
	Meets*1	Partially Meets*1	Does not meet*1	Not applicable*1	
Corporate	13	15	1 ²	0	29
JX Metals Smelting Co., Ltd. (Saganoseki Smelter & Refinery)	21	3	0	7	31
JX Metals Smelting Co., Ltd. (Hitachi Works)	21	3	0	7	31
TANIOBIS (Goslar)	21	3	0	7	31
TANIOBIS (Laufenburg)	21	3	0	7	31
TANIOBIS (Thailand)	21	3	0	7	31
Caserones Copper Mine	27	3	0	1	31
Kasuga Mine	22	3	0	6	31

*1 Meets: All the criteria indicated for each PE item in the Validation Guidance of ICMM have been met and there is sufficient evidence to demonstrate that these have been met




Partially meets: Some of the criteria of the Validation Guidance have been met, or there is some insufficient evidence

Does not meet: The criteria have not been met, or there is no evidence



Not applicable: Not applicable to Validation Guidance criteria

*2 This is due to no Group-wide policy prohibiting exploration or development of new mines in World Heritage areas. We will consider the possibility of establishing such a policy going forward.

Mass Balance Table for the Group (Fiscal 2021)

INPUT	
 <p>Raw Materials ✓</p> <p>Primary raw materials</p> <p>Domestic operating sites 1,378 kt</p> <p>Overseas operating sites 19 kt</p> <p>Total 1,397 kt</p> <p>Recycled raw materials</p> <p>Domestic operating sites 164 kt</p> <p>Overseas operating sites 13 kt</p> <p>Total 178 kt</p>	 <p>Energy ✓</p> <p>Fuel</p> <p>Domestic operating sites 2,728 TJ</p> <p>Overseas operating sites 2,290 TJ</p> <p>Total 5,018 TJ</p> <p>Electricity*</p> <p>Domestic operating sites 11,804 TJ</p> <p>Overseas operating sites 9,668 TJ</p> <p>Total 21,472 TJ</p> <p><small>* Includes thermal energy (consuming steam, hot water, and cold water) supplied by third parties</small></p>
 <p>Water Resources ✓</p> <p>Fresh water</p> <p>Domestic operating sites 17.7 million cubic meters</p> <p>Overseas operating sites 9.9 million cubic meters</p> <p>Total 27.6 million cubic meters</p> <p>Seawater</p> <p>Domestic operating sites 33.4 million cubic meters</p> <p>Overseas operating sites — million cubic meters</p> <p>Total 33.4 million cubic meters</p>	

JX Nippon Mining & Metals Group

OUTPUT	
 <p>Principal Products ✓</p> <p>Copper concentrate 311 kt</p> <p>Electrolytic copper 383 kt</p> <p>Gold 35 t</p> <p>Silver 320 t</p> <p>Platinum 515 kg</p> <p>Palladium 2,301 kg</p> <p>Other metals (selenium, tellurium) 339 t</p> <p>Electro-deposited and rolled copper foil 12 kt</p> <p>Copper alloy, special steel strips, etc. 33 kt</p> <p>Titanium sponge 20 kt</p> <p>Sulfuric acid (by-product) 1,047 kt</p>	 <p>Emissions</p> <p>CO₂ ✓</p> <p>Total of domestic operating sites</p> <p>Scope1 383 kt</p> <p>Scope2 282 kt</p> <p>Total of overseas operating sites</p> <p>Scope1 155 kt</p> <p>Scope2 73 kt</p> <p>Total 892 kt</p> <p>Chemical substances (release and transfer) ✓</p> <p>Total of domestic operating sites 0.42 kt</p> <p>Sulphur oxides ✓</p> <p>Domestic operating sites 4.4 kt</p> <p>Overseas operating sites 0.1 kt</p> <p>Total 4.5 kt</p> <p>Nitrogen oxides ✓</p> <p>Domestic operating sites 0.3 kt</p> <p>Overseas operating sites 0.0 kt</p> <p>Total 0.3 kt</p> <p>Final disposal of waste materials ✓</p> <p>Domestic operating sites 8.7 kt</p> <p>Overseas operating sites 45.7 kt</p> <p>Total 54.4 kt</p> <p>Wastewater ✓</p> <p>Domestic operating sites 52.5 million cubic meters</p> <p>Overseas operating sites 1.1 million cubic meters</p> <p>Total 53.6 million cubic meters</p>

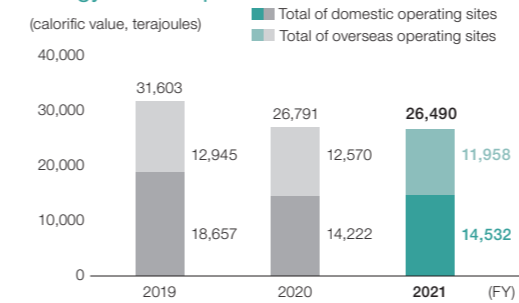
Environmental Management

Operating Sites That Have Obtained ISO 14001 Certification (as of March 31, 2022)

Domestic Operating Sites: 29	Overseas Operating Sites: 12
Hitachi Works of JX Nippon Mining & Metals Corporation (including HMC Manufacturing Department, Technology Development Center, Hitachi Seido Works of JX Metals Smelting Co., Ltd. and JX Nippon Environmental Services Co., Ltd.) Copper Foil Dept. of JX Nippon Mining & Metals Corporation (including Hitachi Works of JX Nippon Foundry Co., Ltd. and Ichinoseki Foil Manufacturing Co., Ltd.) Isohara Works of JX Nippon Mining & Metals Corporation Kurami Works of JX Nippon Mining & Metals Corporation (including JX Nippon Coil Center Co., Ltd. and the Kurami Office of JX Metals Trading Co., Ltd.) Saganoseki Smelter & Refinery of JX Metals Smelting Co., Ltd. (including Japan Copper Casting Co., Ltd., and JX Metals Smelting Logitech Co., Ltd.) JX Nippon Tomakomai Chemical Co., Ltd. JX Nippon Mikkaichi Recycle Co., Ltd. Chigasaki Plant of Toho Titanium Co., Ltd. (including its Kurobe Plant and Wakamatsu Plant and Toho Technical Service Co., Ltd.) JX Metals Precision Technology Co., Ltd. (Esashi Works, Tatebayashi Works, Nasu Works, and Kakegawa Works) Amagasaki Office of JX Metals Trading Co., Ltd. (including Takatsuki Plant) Shirakawa Plant of JX Nippon Takasho Co., Ltd. Tsukuba Factory of Furuuchi Chemical Corporation	JX Nippon Mining & Metals Philippines, Inc. JX Nippon Mining & Metals USA, Inc. Materials Service Complex Malaysia Sdn. Bhd. JX Nippon Mining & Metals Korea Co., Ltd. Nikko Fuji Precision (Wuxi) Co., Ltd. Longtan Works of Nikko Metals Taiwan Co., Ltd. Nippon Mining & Metals (Suzhou) Co., Ltd. JX Nippon Mining & Metals Dongguan Co., Ltd. TANIJOBIS GmbH (includes TANIJOBIS Smelting GmbH & Co. KG, TANIJOBIS Japan Co., Ltd., and TANIJOBIS Co., Ltd.)

Energy

Energy Consumption

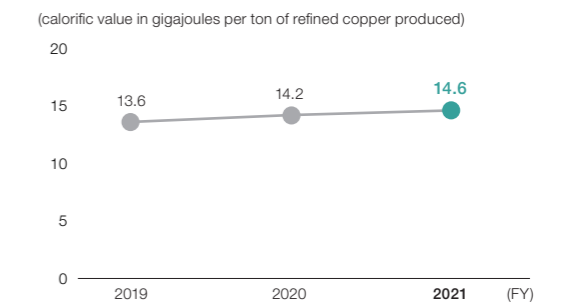


* Energy consumption is calculated by applying the calorific value conversion coefficients for fuel and electricity as stipulated in the Act on the Rational Use of Energy (Energy Conservation Act). (9.97 MJ/kWh or 9.28 MJ/kWh is applied for purchased electricity)

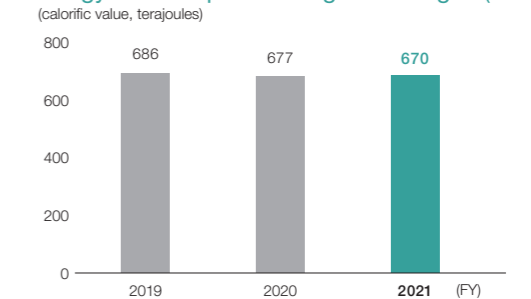
Breakdown by Fuel Type

	Domestic operating sites	Overseas operating sites
Kerosene (kL)	143	—
Light oil (kL)	2,725	52,663
Class A heavy oil (kL)	9,755	1,003
Class B and C heavy oil (kL)	14,492	1,972
Reclaimed oil (kL)	2,558	—
LPG/Butane (t)	5,399	7
LNG (t)	4,664	843
Coke (t)	3,146	—
Petroleum coke (t)	2,558	—
City gas (thousand cubic meters)	18,343	2,980

Energy Consumption Intensity at Smelters and Refineries (Fuel and Electricity)



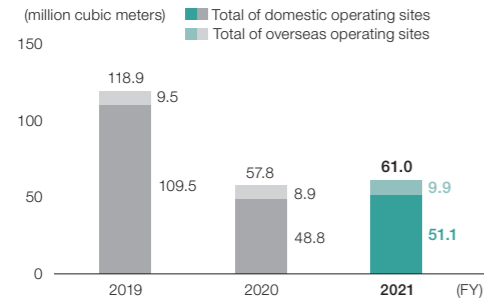
Energy Consumption in Logistics Stages (Domestic)



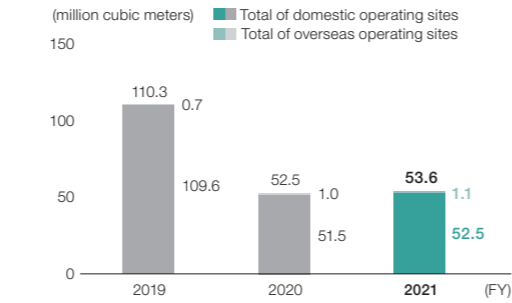
* Applicable to specified consigners as defined in the Act on the Rational Use of Energy. Four Group companies fall under this definition: JX Nippon Mining & Metals Corporation, JX Metals Smelting Co., Ltd., Kasuga Mines Co., Ltd., and Pan Pacific Copper Co., Ltd.

Water Resources

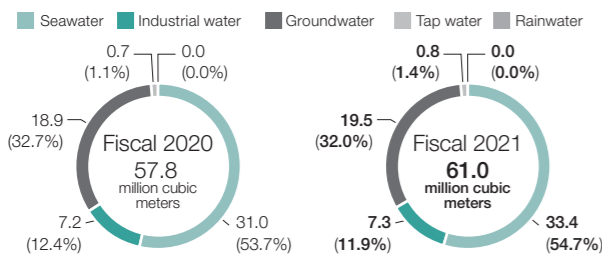
Water Usage*1



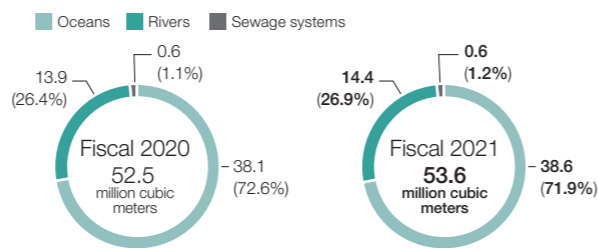
Water Discharge Volume*2



Total Water Usage*1

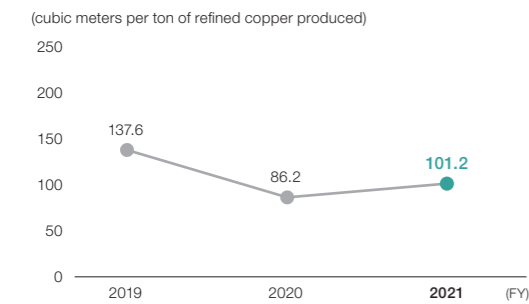


Total Water Discharge*2

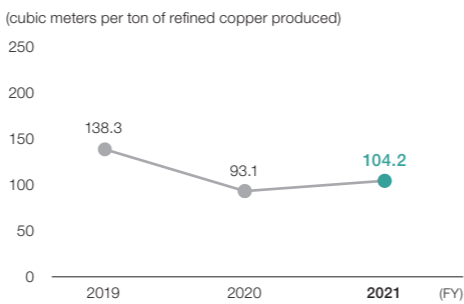


*1 Seawater usage at the Saganoseki Smelter & Refinery of JX Metals Smelting Co., Ltd. is calculated based on pumping capacity. Freshwater usage at the Saganoseki Smelter & Refinery of JX Metals Smelting Co., Ltd. and water usage at other operating sites are based on flowmeter readings or on invoices from the site's respective water utility.
 *2 The volume of water discharged into public waters (oceans and rivers) at each operating site represents the following: an amount calculated based on drainage weirs (Hitachi Works, Isohara Works, JX Nippon Tomakomai Chemical Co., Ltd., and JX Nippon Mikkaichi Recycle Co., Ltd.); an amount obtained by multiplying groundwater usage by a fixed rate (Kurami Works, Toho Titanium Co., Ltd.'s Chigasaki Plant); an amount from invoices (Toho Titanium Co., Ltd.'s Yahata Plant and Kurobe Plant); or an amount based on flowmeter readings (other operating sites). The volume of water discharged into the sewage system at each operating site represents the following: an amount calculated based on daily water discharge (TANIOBIS Co., Ltd.); or an amount based on flowmeter readings or on invoices from the site's respective sewage utility for other operating sites.

Water Usage Intensity at Smelters and Refineries

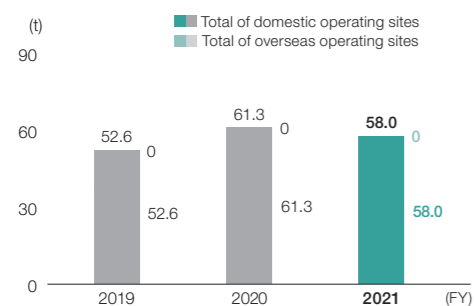


Water Discharge Intensity at Smelters and Refineries



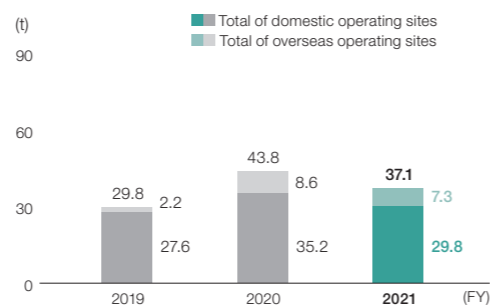
Water Pollutants

COD Load



* Totals are for operating sites subject to legal requirements (sites that discharge water into oceans).

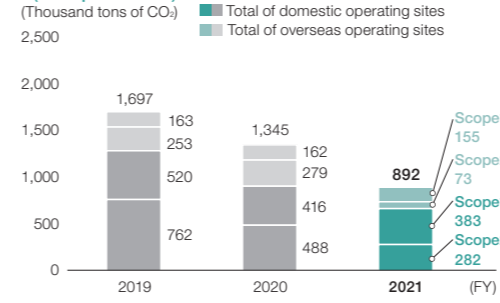
BOD Load



* Totals are for operating sites subject to legal requirements (sites that discharge water into rivers or streams).

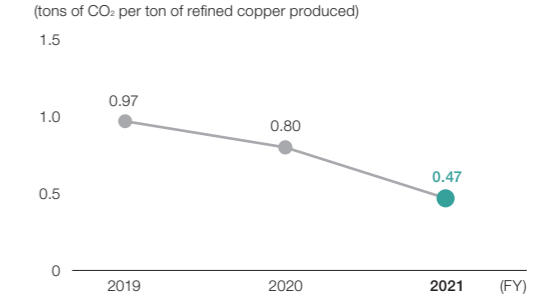
Climate Change

CO₂ Emissions From the Entire JX NMM Group (Scope 1 & 2)

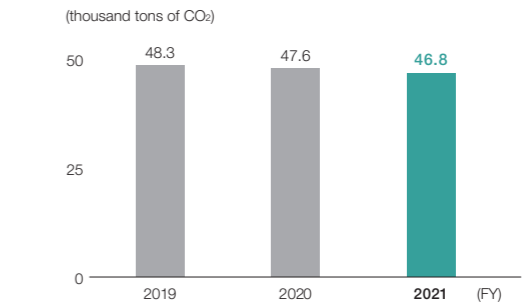


* Scope 1 emissions are those from energy consumption (fuel), emissions from incineration of waste materials (waste oil, waste plastic, sludge, waste wood), and emissions from reducing agents, neutralizing agents, graphite electrodes, and recycled materials, converted to equivalent CO₂.
 * Scope 2 emissions are those from electricity consumption converted to equivalent CO₂. Emissions from electricity consumption include those from thermal energy (consuming steam, hot water, cold water) supplied by third parties. The emission factors applied for Scope 2 calculation are as follows for domestic and overseas Group operating sites, respectively.
 Domestic: The latest adjusted emission factors per electric power utility published by the Ministry of the Environment and the Ministry of Economy, Trade and Industry are applied.
 Overseas: Emission factors published by local power companies, national governments, or country-specific emission factors published in the IEA Emission Factors 2021, issued by the International Energy Agency (IEA), are applied.

CO₂ Emission Intensity at Smelters and Refineries



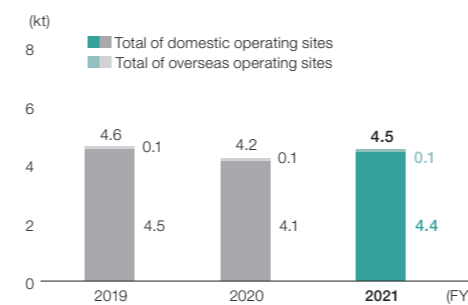
CO₂ Emissions in Logistics Stages



* Applicable to specified consigners as defined in the Act on the Rational Use of Energy. Four Group companies fall under this definition: JX Nippon Mining & Metals Corporation, JX Metals Smelting Co., Ltd., Kasuga Mines Co., Ltd., and Pan Pacific Copper Co., Ltd.

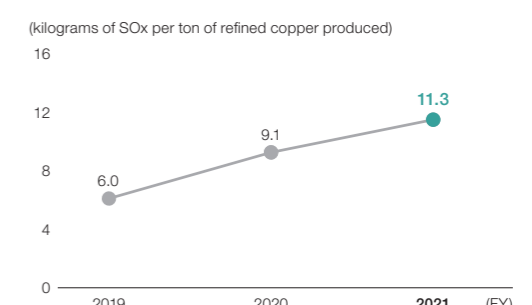
Air Pollutants

SO_x Emissions

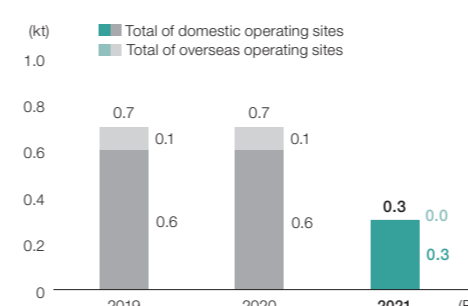


* Totals are for operating sites subject to emissions regulations.

SO_x Emission Intensity at Smelters and Refineries

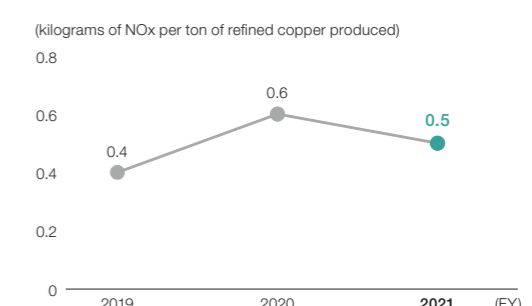


NO_x Emissions



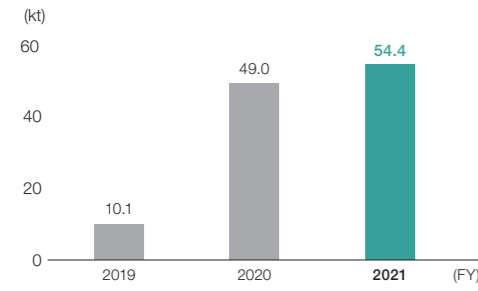
* Totals are for operating sites subject to emissions regulations.

NO_x Emission Intensity at Smelters and Refineries



Waste Materials and By-Products

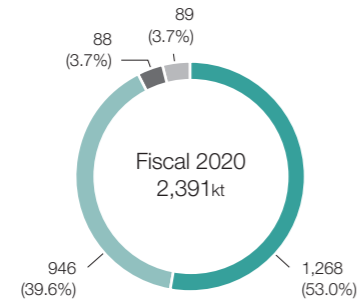
Volume of Final Disposal of Waste



* These do not include the approximately 27.0 million tons of slag from the Caserones Copper Mine.
 * The volume of final disposal of waste has increased rapidly due to the inclusion of Toho Titanium Co., Ltd.'s offshore landfill volume and final disposal volume of the TANIJOBIS Group in calculations, as of fiscal 2020.

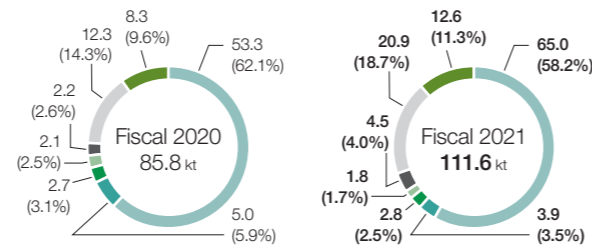
By-Product Production

■ Sulfuric acid ■ Slag ■ Gypsum ■ Iron concentrate



Total Discharge Volume by Type of Waste Materials

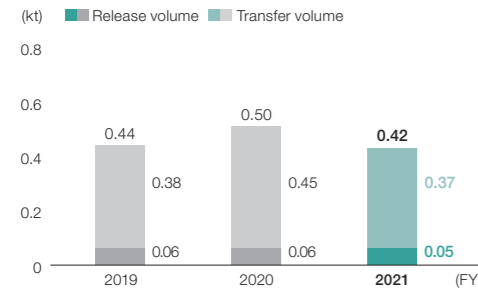
■ Sludge ■ Cinders ■ Waste plastics ■ Waste oil ■ Acid/Alkaline waste ■ Slag ■ Other



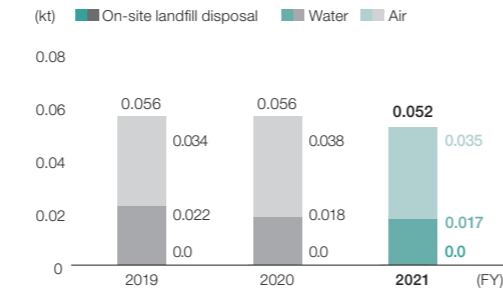
* Total emissions increased because slag, which had been reused as valuable resources, is now treated as waste.

Chemical Substances

Volumes of Release and Transfer of PRTR Substances



Breakdown of Release Volumes of PRTR Substances



Volumes of Release and Transfer of Major PRTR Substances in Fiscal 2021

No.	Cabinet order no.	Chemical substance	Release volume			Transfer volume	
			Air	Water	On-site landfill disposal	Sewage systems	Waste materials
1	31	Antimony and its compounds	0.1	0.5	0.0	0.0	7.9
2	75	Cadmium and its compounds	0.1	0.1	0.0	0.0	20.8
3	132	Cobalt and its compounds	0.0	0.1	0.0	0.0	19.5
4	300	Toluene	32.0	0.0	0.0	1.6	281.0
5	305	Lead compounds	0.7	0.1	0.0	0.0	14.6
6	309	Nickel compounds	0.1	0.4	0.0	0.0	9.3
7	354	Dibutyl phthalate	0.0	0.0	0.0	0.3	5.8
8	405	Boron compounds	0.0	9.3	0.0	0.0	3.5
9	243	Dioxins	0.1	0.0	0.0	0.0	7.0

* The values given are the total amount reported by operating sites subject to reporting requirements under the PRTR Act. (the domestic companies defined in Scope of this Report on page 3 as subject to Environment section reporting).
 Of the 49 chemical substances subject to reporting, those totaling at least 5.0 tons in any category, and dioxins, are listed here.
 There were no cases of chemical substances released into the soil.

Occupational Health and Safety

Occupational and Other Accidents*1, *2

Category		2019	2020	2021	
Employees (including Group companies)	Casualties of occupational accidents <input checked="" type="checkbox"/>	Fatalities (persons)*4	0	0	0
		Occupational accidents with severe consequences (persons)*4	0	0	0
		Accidents with lost work days (persons)*4	3	7	10
		Accidents without lost work days (persons)*4	10	13	24
	Total (persons)	13	20	34	
	Major types of occupational accidents <input checked="" type="checkbox"/>	Strain or overexertion	1	5	6
		Fall on same level	1	1	3
		Caught in, on or between	1	3	1
	Frequency rate of industrial accidents <input checked="" type="checkbox"/>	Fatalities*4	—	0.00	0.00
		Occupational accidents with severe consequences*4	—	0.00	0.00
Accidents with lost work days*4		—	0.53	0.74	
Severity rate of industrial accidents <input checked="" type="checkbox"/>	—	0.03	0.03		
Cumulative work hours*5	—	13,290,060	13,442,362		
Safety performance at domestic operating sites*5	Casualties of occupational accidents <input checked="" type="checkbox"/>	Fatalities (persons)	0	2	0
		Occupational accidents with severe consequences (persons)	2	0	0
		Accidents with lost work days (persons)	2	2	6
		Accidents without lost work days (persons)	5	6	13
	Total (persons)	9	10	19	
	Major types of occupational accidents <input checked="" type="checkbox"/>	Cut or rubbed	1	4	4
		Crashes or falls to lower level	0	2	2
		Struck by object	2	0	0
	Frequency rate of industrial accidents <input checked="" type="checkbox"/>	Fatalities*4	—	0.64	0.00
		Occupational accidents with severe consequences*4	—	0.00	0.00
Accidents with lost work days*4		—	0.64	1.94	
Severity rate of industrial accidents <input checked="" type="checkbox"/>	—	4.82	0.11		
Cumulative work hours*7	—	3,117,548	3,090,280		
(Reference) Safety performance at overseas operating sites*10 <input checked="" type="checkbox"/>	Casualties of occupational accidents <input checked="" type="checkbox"/>	Fatalities (persons)	1	0	0
		Accidents with lost work days (persons)	18	13	19
		Accidents without lost work days (persons)	3	5	7
		Total (persons)	22	18	26
	Major types of occupational accidents	Caught in, on or between	8	3	8
		Fall on same level	1	5	4
		Strain or overexertion	0	3	3
	Total casualties (persons) <input checked="" type="checkbox"/>	22	30	53	
	Occupational injury rate per 1,000 employees (four or more lost workdays)*8	0.7	1.1	1.7	
	Explosions and fires (incidences)*9 <input checked="" type="checkbox"/>	3	1	0	

*1 Safety performance data is compiled on a calendar year basis (January to December).
 *2 The number of casualties presented in this table includes work-related illnesses such as back pain and heat stroke.
 *3 Until 2019, data included the Company and other Group companies (excluding Toho Titanium Co., Ltd.); however, from 2020, Toho Titanium and subcontractors have also been included in the scope of aggregation, and data has been retroactively revised to 2019. Note that frequency and severity rates are excluded.
 *4 Each accident category is defined as follows.
 • Fatalities: Worker deaths resulting from work-related causes.
 • Occupational accidents with severe consequences: Accidents resulting in more than six months of lost work days or a disability grade.
 • Accidents with lost work days: Accidents requiring one or more days of absence from work for the purpose of examination, treatment or recuperation. These shall in principle be at a physician's discretion. Note that this excludes "Occupational accidents with severe consequences."
 • Accidents without lost work days: An accident that does not require one full day or more of absence from work as diagnosed by a physician, and in which the affected worker is able to go to work after the accident.
 *5 Incidences related to the cause of the injury or illness, based on "Types of Accidents," published by the Ministry of Health, Labour and Welfare.
 *6 Both the frequency rate (the number of persons harmed or killed due to occupational accidents per million cumulative actual work hours) and the severity rate (number of work days lost per thousand cumulative actual work hours) had only covered Company employees until 2019; however, as of 2020, these figures cover Company employees and employees at other Group companies (including Toho Titanium Co., Ltd.). Note that cumulative working hours are calculated based on the hours reported from work sites with production facilities (operations divisions) and major offices such as the head office, including some estimation in the figures.
 *7 Safety statistics for subcontractor employees include not only those stationed permanently but also spot vendors. Note that these are subject to statistics for frequency rate and severity rate as of 2020. Here, cumulative work hours are calculated as follows: Number of permanently stationed subcontractor employees at the end of each month x number of operating days x 8 hours/day.
 (Reference) In 2021, the frequency and severity rate of occupational accidents for all businesses in Japan were 2.09 and 0.09, respectively (Source: Ministry of Health, Labour and Welfare, "Survey on Industrial Accidents")
 *8 The Group defines a serious accident as one that results in four or more lost work days, and considers the occupational injury rate per 1,000 employees to be one of its key indicators for evaluation. (Occupational injury rate per 1,000 employees (four or more lost workdays) = number of casualties with four or more lost workdays ÷ total number of employees (including employees of regular partner companies) x 1,000)
 *9 No physical injuries were caused as a result of explosions/fires.
 *10 While this includes Group companies and subcontractors, this data should be used only for reference as it is difficult to conduct follow-up surveys and aggregate working hours for subcontractors at overseas operating sites, and detailed data such as frequency rates are not disclosed.

Human Resource Development

Training Programs Implemented in Fiscal 2021

(hours)

	Managerial staff			Non-management employees			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Total program hours (annual)	13,049	505	13,554	54,244	7,646	61,890	67,293	8,151	75,444
Per employee	30	11	22	42	14	24	24	25	24

* Survey scope: Employees of JX Nippon Mining & Metals plus those seconded by the Company to JX Nippon Environmental Services Co., Ltd. and JX Metals Smelting Co., Ltd. (Saganoseki Smelter & Refinery, Hitachi Refinery)

Employment and Work Styles

Survey scope: Companies in which JX Nippon Mining & Metals has 50% or more of their voting rights, directly or indirectly

Counting of seconded employees: Includes all employees being seconded to or from the companies subject to this survey

No. of Employees (by Employment Status and Employment Contract Type; as of March 31, 2022)

(persons)

Employment status	Contract type	Male	Female	Total
Full-time	Contracts without fixed terms	8,045	1,249	9,294
	Contracts with fixed terms	524	120	644
Full-time subtotal		8,569	1,369	9,938
Part-time	Contracts without fixed terms	27	45	72
	Contracts with fixed terms	67	36	103
Part-time subtotal		94	81	175
Total		8,663	1,450	10,113

(persons)

Employment status	Contract type	Japan	North America	South America	Asia	Europe	Middle East	Total
Full-time	Contracts without fixed terms	6,456	123	916	1,423	364	12	9,294
	Contracts with fixed terms	475	2	76	63	28	0	644
Full-time subtotal		6,931	125	992	1,486	392	12	9,938
Contracts without fixed terms	Part-time subtotal	102	0	0	0	1	0	103
	Part-time subtotal	150	0	0	3	22	0	175
Total		7,081	125	992	1,489	414	12	10,113

No. of Employees (by Region; as of March 31, 2022)

(persons)

	Japan	North America	South America	Asia	Europe	Middle East	Total
Male	6,266	96	904	1,043	342	12	8,663
Female	815	29	88	446	72	0	1,450
Total	7,081	125	992	1,489	414	12	10,113

No. of Newly Hired Employees (April 1, 2021 to March 31, 2022)

(persons)

	Male	Female	Total
New hires	718	151	869
Percent of total employee count as of March 31, 2022	8%	10%	9%

(persons)

Age 29 or younger	Age 30 to 49	Age 50 or older	Total
337	400	132	869
23%	7%	5%	9%

	Japan	North America	South America	Asia	Europe	Middle East	Total
New hires	581	28	140	108	12	0	869
Percent of total employee count as of March 31, 2022	8%	22%	14%	7%	3%	0%	9%

(persons)

No. of Employees Ending Employment (April 1, 2021 to March 31, 2022)

(persons)

	Male	Female	Total
Retiring employees	550	95	645
Percent of total employee count as of March 31, 2022	6%	7%	6%

(persons)

Age 29 or younger	Age 30 to 49	Age 50 or older	Total
146	309	190	645
10%	5%	7%	6%

	Japan	North America	South America	Asia	Europe	Middle East	Total
Retiring employees	357	34	120	124	10	0	645
Percent of total employee count as of March 31, 2022	5%	27%	12%	8%	2%	0%	6%

(persons)

* Figures include employees transferred to companies outside of survey scope and those returning due to termination of secondment.

* Figures do not include employees who were transferred within a company inside the survey scope, or those returning due to termination of secondment.

* Employees retiring at the mandatory retirement age are not in scope.

Membership in Labor Unions (as of March 31, 2022)

(persons)

	Male	Female	Total
No. of union members	5,426	799	6,225
Unionization rate	63%	55%	62%

(persons)

Age 29 or younger	Age 30 to 49	Age 50 or older	Total
1,120	3,896	1,209	6,225
76%	65%	46%	62%

Diversity

Use of Childcare Leave in Fiscal 2021 (JX Nippon Mining & Metals)

(persons)

	Male	Female	Total
No. of employees using leave	20	13	33
No. of employees eligible to use leave*	106	13	119
Usage rate (rounded to nearest percent)	19%	100%	28%

* Male: Employees with a child born within the fiscal year
 Female: Employees whose post-childbirth leave ended during the fiscal year and who can take childcare leave

Retention Rate After Childcare Leave (Percentage of Those Still Employed 12 Months After Returning From Leave) (JX Nippon Mining & Metals)

(persons)

	Male	Female	Total
No. of employees who returned to work from childcare leave during fiscal 2020	19	3	22
No. of employees still employed 12 months after returning to work	16	3	19
Percentage	84%	100%	86%

Rate of Return to Work After Childcare Leave (JX Nippon Mining & Metals)

(persons)

	Male	Female	Total
No. of employees who returned to work from childcare leave during fiscal 2021	17	12	29
No. of employees scheduled to return to work	17	12	29
Percentage	100%	100%	100%

Status of Rehiring Efforts in Fiscal 2021 (JX Nippon Mining & Metals)

(persons)

No. of age-limited retirees	70
No. of these rehired	53
Percentage	76%

Persons With Disabilities as a Percentage of the Workforce in Fiscal 2021 (JX Nippon Mining & Metals)

Percentage of employees with disabilities (statutory minimum: 2.3%)	2.21%
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No. of Locally Hired Senior Managers Overseas (Section Manager or Above) and Locally Hired Employees (as of March 31, 2022)

(persons)

		Number of senior managers	Senior managers as a share of locally hired employees*1	Number of locally hired employees*2
North America	Male	13	15%	85
	Female	3	10%	29
North America subtotal		16	14%	114
South America	Male	43	5%	862
	Female	6	7%	86
South America subtotal		49	5%	948
Europe	Male	38	12%	327
	Female	8	12%	68
Europe subtotal		46	12%	395
Asia	Male	106	11%	982
	Female	63	14%	444
Asia subtotal		169	12%	1,426
Total		280	10%	2,883

Scope of aggregation: Overseas Group companies in which JX Nippon Mining & Metals has 50% or more of their voting rights, directly or indirectly
 Treatment of seconded employees: Employees seconded from companies outside of survey scope to companies inside of survey scope are counted.
 Employees seconded from companies inside of survey scope to companies outside of survey scope are also counted.

*1 Percentage calculated as (Number of senior managers ÷ Number of locally hired employees) x 100

*2 The number of employees directly employed by overseas subsidiaries, excluding employees on secondment and employees transferred to overseas subsidiaries

Independent Assurance Report

To the President and Chief Executive Officer of JX Nippon Mining & Metals Corporation

We were engaged by JX Nippon Mining & Metals Corporation (the "Company") to undertake a limited assurance engagement of the environmental and social performance indicators marked with (the "Indicators") for the period from April 1, 2021 to March 31, 2022; the alignment of the Company's policies to the International Council on Mining and Metals ("ICMM")'s 10 Principles, the relevant Corporate-level Performance Expectations (CPEs) and the applicable mandatory requirements set out in ICMM position statement; the Company's prioritization process for selecting assets for the validation of Asset-level Performance Expectations (APEs); the Company's identification and prioritization of material issues and the Company's approach and management of its material issues included in its Sustainability Report 2022 (the "Report") for the fiscal year ended March 31, 2022.

The Company's Responsibility

The Company is responsible for the preparation of the Indicators in accordance with its own reporting criteria (the "Company's reporting criteria"), as described in the Report; reporting on the alignment of the Company's policies to the ICMM's 10 Principles, the relevant CPEs and the applicable mandatory requirements set out in ICMM position statements; reporting on the Company's prioritization process for selecting assets for the validation of APEs; reporting on the Company's identification and prioritization of material issues and reporting on the Company's approach and management of its material issues.

Our Responsibility

Our responsibility is to express a limited assurance conclusion on the Indicators based on the procedures we have performed. We conducted our engagement in accordance with the 'International Standard on Assurance Engagements (ISAE) 3000, Assurance Engagements other than Audits or Reviews of Historical Financial Information' and the 'ISAE 3410, Assurance Engagements on Greenhouse Gas Statements' issued by the International Auditing and Assurance Standards Board. The limited assurance engagement consisted of making inquiries, primarily of persons responsible for the preparation of information presented in the Report, and applying analytical and other procedures, and the procedures performed vary in nature from, and are less in extent than for, a reasonable assurance engagement. The level of assurance provided is thus not as high as that provided by a reasonable assurance engagement. Our assurance procedures included:

- Interviewing the Company's responsible personnel to obtain an understanding of its policy for preparing the Report and reviewing the Company's reporting criteria.
- Inquiring about the design of the systems and methods used to collect and process the Indicators.
- Performing analytical procedures on the Indicators.
- Examining, on a test basis, evidence supporting the generation, aggregation and reporting of the Indicators in conformity with the Company's reporting criteria, and recalculating the Indicators.
- Visiting Toho Titanium Co., Ltd.'s Wakamatsu Plant and Yahata Plant selected on the basis of a risk analysis.
- Evaluating the overall presentation of the Indicators.
- Assessing the alignment of the Company's policies to the ICMM's 10 Principles, the relevant CPEs and the applicable mandatory requirements set out in ICMM position statements through documentation reviews and interviews.
- Assessing the Company's prioritization process for selecting assets for the validation of APEs through documentation reviews and interviews.
- Interviewing the Company's responsible personnel and reviewing documents with respect to the Company's process of identifying and prioritization its material issues and its approach to and management of its material issues.

Conclusion

Based on the procedures performed, as described above, nothing has come to our attention that causes us to believe that:

- the Indicators in the Report are not prepared, in all material respects, in accordance with the Company's reporting criteria as described in the Report;
- the Company's policies are not aligned to the ICMM's 10 Principles and the applicable mandatory requirements set out in ICMM position statements as described on page 18 of the Report;
- the Company's self-assessment of the relevant CPEs is not as described on page 108 of the Report;
- the Company's prioritization process for selecting assets for the validation of APEs is not as described on page 108 of the Report;
- the Company has not identified and prioritized its material issues as described on pages 35 and 36 of the Report;
- the Company has not approached and managed its material issues as described on pages 35, 36, 47, 61, 77, 89, 94 and 99 of the Report.

Our Independence and Quality Control

We have complied with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which includes independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. In accordance with International Standard on Quality Control 1, we maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Kazuhiko Saito, Partner, Representative Director

KPMG AZSA Sustainability Co., Ltd.

Tokyo, Japan

March 23, 2023

Notes to the Reader of Independent Assurance Report:

This is a copy of the Independent Assurance Report and the original copies are kept separately by the Company and KPMG AZSA Sustainability Co., Ltd.

GRI Standards Content Index (Core Option)

○ = Core Items ● = Standards adopted for core option compliance ● = Standard adopted for reference, rather than for compliance

General Standard Disclosure Items

No.	Disclosure	Relevant contents
GRI 102: General Disclosures (2016)		
Organizational profile		
○102-1	Name of the organization	P15-16: Global Network
○102-2	Activities, brands, products, and services	P21-22: Value Creation Model P27-28: The JX Nippon Mining & Metals Group for the Future Society P29-34: Strategies By Business
○102-3	Location of headquarters	P15-16: Global Network
○102-4	Location of operations	P15-16: Global Network
○102-5	Ownership and legal form	P15-16: Global Network
○102-6	Markets served	P11-14: Medium-Term Management Plan for Fiscal 2020 to 2022 P15-16: Global Network
○102-7	Scale of the organization	P11-14: Medium-Term Management Plan for Fiscal 2020 to 2022 P15-16: Global Network P27-28: The JX Nippon Mining & Metals Group for the Future Society P115-116: ESG Data Book (Employment and Work Styles)
○102-8	Information on employees and other workers	P115-116: ESG Data Book (Employment and Work Styles)
○102-9	Supply chain	P21-22: Value Creation Model P23-26: Special Feature 1 Sustainable Copper Vision P27-28: The JX Nippon Mining & Metals Group for the Future Society P29-34: Strategies By Business
○102-10	Significant changes to the organization and its supply chain	N/A
○102-11	Precautionary Principle or approach	P7-10: Message From the President P23-26: Special Feature 1 Sustainable Copper Vision P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P37-46: Special Feature 2 The JX Nippon Mining & Metals Group's Climate Change Strategy P47-54: Contributing to Environmental Conservation P55-60: Special Feature 3 Further Accelerating our Digital Transformation (DX) Strategy P77-88: Create Attractive Workplaces P89-93: Respect Human Rights P99-107: Strengthen Governance
○102-12	External initiatives	P17-19: Responding to International Norms and Initiatives
○102-13	Membership of associations	P17-19: Responding to International Norms and Initiatives
Strategy		
○102-14	Statement from senior decision-maker	P7-10: Message From the President
102-15	Key impacts, risks, and opportunities	P7-10: Message From the President P11-14: Medium-Term Management Plan for Fiscal 2020 to 2022 P20: Outside Director Message P21-22: Value Creation Model P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators)
Ethics and integrity		
○102-16	Values, principles, standards, and norms of behavior	P1-2: JX Nippon Mining & Metals Group Code of Conduct
102-17	Mechanisms for advice and concerns about ethics	P99-107: Strengthen Governance
Governance		
○102-18	Governance structure	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P99-107: Strengthen Governance
102-19	Delegating authority	—
102-20	Executive-level responsibility for economic, environmental, and social topics	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators)
102-21	Consulting stakeholders on economic, environmental, and social topics	—
102-22	Composition of the highest governance body and its committees	—
102-23	Chair of the highest governance body	—
102-24	Nominating and selecting the highest governance body	—
102-25	Conflicts of interest	P100: Corporate Governance
102-26	Role of highest governance body in setting purpose, values, and strategy	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators)
102-27	Collective knowledge of highest governance body	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators)
102-28	Evaluating the highest governance body's performance	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators)
102-29	Identifying and managing economic, environmental and social impacts	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators)
102-30	Effectiveness of risk management processes	P103-106: Risk Management
102-31	Review of economic, environmental, and social topics	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators)
102-32	Highest governance body's role in sustainability reporting	—
102-33	Communicating critical concerns	P103-106: Risk Management
102-34	Nature and total number of critical concerns	—

102-35	Remuneration policies	—
102-36	Process for determining remuneration	—
102-37	Stakeholders' involvement in remuneration	—
102-38	Annual total compensation ratio	—
102-39	Percentage increase in annual total compensation ratio	—
Stakeholder engagement		
○102-40	List of stakeholder groups	P98: Stakeholder Engagement
○102-41	Collective bargaining agreements	P115-116: ESG Data Book (Employment and Work Styles)
○102-42	Identifying and selecting stakeholders	P89-92: Respect Human Rights Principles P98: Stakeholder Engagement
○102-43	Approach to stakeholder engagement	P98: Stakeholder Engagement
○102-44	Key topics and concerns raised	P98: Stakeholder Engagement
Reporting practice		
○102-45	Entities included in the consolidated financial statements	P3-4: Editorial Policy
○102-46	Defining report content and topic Boundaries	P3-4: Editorial Policy
○102-47	List of material topics	P21-22: Value Creation Model P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators)
○102-48	Restatements of information	N/A
○102-49	Changes in reporting	N/A
○102-50	Reporting period	P3-4: Editorial Policy
○102-51	Date of most recent report	P3-4: Editorial Policy
○102-52	Reporting cycle	P3-4: Editorial Policy
○102-53	Contact point for questions regarding the report	Back cover
○102-54	Claims of reporting in accordance with the GRI Standards	P3-4: Editorial Policy GRI Standards Content Index (This page)
○102-55	GRI content index	GRI Standards Content Index (This page)
○102-56	External assurance	P3-4: Editorial Policy P118: Independent Assurance Report

Specific Standard Disclosures

Contributing to Environmental Conservation		
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundary	P23-26: Special Feature 1 Sustainable Copper Vision P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P37-46: Special Feature 2 The JX Nippon Mining & Metals Group's Climate Change Strategy P47: Contributing to Environmental Conservation
103-2	The management approach and its components	P23-26: Special Feature 1 Sustainable Copper Vision P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P37-46: Special Feature 2 The JX Nippon Mining & Metals Group's Climate Change Strategy P47-54: Contributing to Environmental Conservation
103-3	Evaluation of the management approach	P23-26: Special Feature 1 Sustainable Copper Vision P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P37-46: Special Feature 2 The JX Nippon Mining & Metals Group's Climate Change Strategy P47-54: Contributing to Environmental Conservation
GRI 301: Materials (2016)		
301-1	Materials used by weight or volume	P109: ESG Data Book (Mass Balance Table for the Group)
301-2	Recycled input materials used	P109: ESG Data Book (Mass Balance Table for the Group)
301-3	Reclaimed products and their packaging materials	—
GRI 302: Energy (2016)		
302-1	Energy consumption within the organization	P109-110: ESG Data Book (Mass Balance Table for the Group, Energy)
302-2	Energy consumption outside of the organization	P109-110: ESG Data Book (Mass Balance Table for the Group, Energy)
302-3	Energy intensity	P109-110: ESG Data Book (Mass Balance Table for the Group, Energy)
302-4	Reduction of energy consumption	P109-110: ESG Data Book (Mass Balance Table for the Group, Energy)
302-5	Reductions in energy requirements of products and services	—
GRI 303: Water and Effluents (2018)		
303-1	Interactions with water as a shared resource	P53: Other Initiatives for Environmental Conservation
303-2	Management of water discharge-related impacts	—
303-3	Water withdrawal	—
303-4	Water discharge	P111: ESG Data Book (Water Resources)
303-5	Water consumption	P111: ESG Data Book (Water Resources)
GRI 304: Biodiversity (2016)		
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	P51-52: Conservation of Biodiversity
304-2	Significant impacts of activities, products, and services on biodiversity	—
304-3	Habitats protected or restored	P51-52: Conservation of Biodiversity

ESG Data Book
GRI Standards Content Index

304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	—
GRI 305: Emissions (2016)		
305-1	Direct (Scope 1) GHG emissions	P109: ESG Data Book (Mass Balance Table for the Group) P112: ESG Data Book (Climate Change, Air Pollutants)
305-2	Energy indirect (Scope 2) GHG emissions	P109: ESG Data Book (Mass Balance Table for the Group) P112: ESG Data Book (Climate Change, Air Pollutants)
305-3	Other indirect (Scope 3) GHG emissions	P112: ESG Data Book (Climate Change, Air Pollutants)
305-4	GHG emissions intensity	P112: ESG Data Book (Climate Change, Air Pollutants)
305-5	Reduction of GHG emissions	P37-46: Special Feature 2 The JX Nippon Mining & Metals Group's Climate Change Strategy
305-6	Emissions of ozone-depleting substances (ODS)	—
305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	P109: ESG Data Book (Mass Balance Table for the Group) P112: ESG Data Book (Climate Change, Air Pollutants) P113: ESG Data Book (Chemical Substances)
GRI 306: Waste (2020)		
306-1	Waste generation and significant waste-related impacts	P23-26: Special Feature 1 Sustainable Copper Vision
306-2	Management of significant waste-related impacts	P23-26: Special Feature 1 Sustainable Copper Vision
306-3	Waste generated	P113: ESG Data Book (Waste Materials and By-Products)
306-4	Waste diverted from disposal	P113: ESG Data Book (Waste Materials and By-Products)
306-5	Waste directed to disposal	P113: ESG Data Book (Waste Materials and By-Products)
GRI 307: Environmental Compliance (2016)		
307-1	Non-compliance with environmental laws and regulations	P54: Environmental Management
Provide Advanced Materials That Support Lives and Lifestyles		
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundary	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P61: Provide Advanced Materials That Support Lives and Lifestyles
103-2	The management approach and its components	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P61-76: Provide Advanced Materials That Support Lives and Lifestyles
103-3	Evaluation of the management approach	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P61-76: Provide Advanced Materials That Support Lives and Lifestyles
Create Attractive Workplaces		
GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundary	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P77: Create Attractive Workplaces
103-2	The management approach and its components	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P77-88: Create Attractive Workplaces
103-3	Evaluation of the management approach	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P77-88: Create Attractive Workplaces
GRI 401: Employment (2016)		
401-1	New employee hires and employee turnover	P115-116: ESG Data Book (Employment and Work Styles)
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	—
401-3	Parental leave	P115-116: ESG Data Book (Employment and Work Styles)
GRI 403: Occupational Health and Safety (2018)		
403-1	Occupational health and safety management system	P78-81: Ensure Safety and Promote Health P114: ESG Data Book (Occupational Health and Safety)
403-2	Hazard identification, risk assessment, and incident investigation	P78-81: Ensure Safety and Promote Health P114: ESG Data Book (Occupational Health and Safety)
403-3	Occupational health services	P78-81: Ensure Safety and Promote Health P114: ESG Data Book (Occupational Health and Safety)
403-4	Worker participation, consultation, and communication on occupational health and safety	P78-81: Ensure Safety and Promote Health P114: ESG Data Book (Occupational Health and Safety)
403-5	Worker training on occupational health and safety	Worker training on occupational health and safety
403-6	Promotion of worker health	P78-81: Ensure Safety and Promote Health
403-7	Prevention and mitigation of occupational health and impacts directly linked by business relationships	P78-81: Ensure Safety and Promote Health
403-8	Workers covered by an occupational health and safety management system	—
403-9	Work-related injuries	P78-81: Ensure Safety and Promote Health P114: ESG Data Book (Occupational Health and Safety)
403-10	Work-related ill health	—
GRI 404: Training and Education (2016)		
404-1	Average hours of training per year per employee	P115: ESG Data Book (Human Resource Development)
404-2	Programs for upgrading employee skills and transition assistance programs	P85-86: Human Resource Developments
404-3	Percentage of employees receiving regular performance and career development reviews	—

GRI 405: Diversity and Equal Opportunity (2016)		
405-1	Diversity of governance bodies and employees	P117: ESG Data Book (Diversity)
405-2	Ratio of basic salary and remuneration of women to men	—

Respect Human Rights

GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundary	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P89: Respect Human Rights
103-2	The management approach and its components	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P89-93: Respect Human Rights
103-3	Evaluation of the management approach	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P89-93: Respect Human Rights

GRI 411: Rights of Indigenous Peoples (2016)

411-1	Incidents of violations involving rights of indigenous peoples	P89-92: Respect Human Rights Principles
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GRI 412: Human Rights Assessment (2016)

412-1	Operations that have been subject to human rights reviews or impact assessments	P89-92: Respect Human Rights Principles
412-2	Employee training on human rights policies or procedures	P93: Human Rights Education and Internal Awareness Raising
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	—

Coexistence and Co-Prosperity With Local Communities

GRI 103: Management Approach (2016)		
103-1	Explanation of the material topic and its Boundary	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P94: Coexistence and Co-Prosperity With Local Communities
103-2	The management approach and its components	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P94-98: Coexistence and Co-Prosperity With Local Communities
103-3	Evaluation of the management approach	P35-36: Materialities (Priority Issues) and KPIs (Key Performance Indicators) P94-98: Coexistence and Co-Prosperity With Local Communities

GRI 202: Market Presence (2016)

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Strengthen Governance

GRI 103: Management Approach (2016)		
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We welcome your views and questions regarding this *Sustainability Report 2022*.

Any opinions provided will be used to improve future reports even further.

Please use our e-mail or post address below to contact us.

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