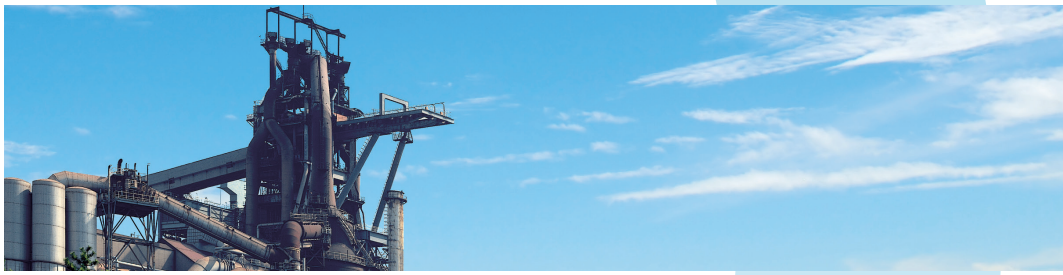


JFE GROUP

SUSTAINABILITY REPORT 2023

JFE

Contents

JFE Group
SUSTAINABILITY REPORT 2023

Message from the CEO

September 2023

Koji Kakigi

Representative Director, President and CEO
JFE Holdings, Inc.

Biggest Transformation in the Company's History, Aimed at Achieving Global Success for the Future Prosperity of the Earth

JFE Group's Vision

Guided by its corporate vision of contributing to society with the world's most innovative technology, the JFE Group has flexibly responded to a dramatically changing business environment to achieve sustainable growth. Under the Seventh Medium-term Business Plan (hereinafter "medium-term plan") formulated in 2021, the years FY2021 to FY2024 are a time to take on the challenges of the most transformative period in the company's history to ensure a prosperous future for the planet. Our goal is to enhance medium to long-term corporate value by securing environmental and social sustainability in balance with economic sustainability. We have designated KPIs for material issues of corporate management that were identified for the policies and initiatives of the medium-term plan and promoted sustainability initiatives focused on environmental and social issues as well as essential economic issues for the sustainable growth of the JFE Group.

In particular, we have positioned climate change as a top-priority business issue and formulated the JFE Group Environmental Vision for 2050. The vision provides a roadmap to decarbonization based on the dual goals of reducing CO_2 emissions at JFE Steel and for society as a whole. We are developing technologies to address these challenges as an opportunity for growth. JFE will continue to systematically ensure a stable supply of steel, the core of JFE's business, to society as an indispensable material for social development and daily life.

The JFE Group will consistently rise to the challenge of transformative change as an essential participant in the sustained development of society and the safety and comfort of daily life.

Addressing Climate Change

The urgency of climate change has spread around the world. Since the steel business constitutes the core of the JFE Group's operations, climate change is a vital management issue for continuing to do business. With respect to CO_2 emissions, we are working to meet our target of reducing CO_2 emissions by 18% from FY2013 levels by the end of FY2024. In FY2022, we reduced emissions by approximately 13% from FY2013 levels and achieved our related KPI target through energy conservation and technological development with solid results. The measures announced in the JFE Group Environmental Vision for 2050 will continue to be implemented.

In FY2022, we presented our policy and timing for demonstration tests and implementation of ultra-innovative technologies for achieving carbon neutrality in 2050 as well as a roadmap for the transition to low-carbon iron and steelmaking processes by 2030. We announced plans for replacing one blast furnace in the Kurashiki district with large, high-efficiency electric arc furnaces between 2027 and 2030 and introduced a process for significantly bringing down CO_2 emissions by expanding the use of scrap at converter furnaces in all districts. Moreover, we have decided to reinforce the electric arc furnace at the Sendai Works. In the engineering business, the construction and operation of renewable energy plants and recycling facilities have contributed to reducing CO_2 emissions by approximately 580,000 tons from FY2021.

In FY2023, we will introduce an electric arc furnace to the stainless steel manufacturing process in the Chiba district. In addition, we will begin constructing test facilities for the carbon recycling blast furnace*1 and hydrogen-based ironmaking*2 as ultra-innovative technologies under development with government support.

In the engineering business, we are promoting the commercialization of offshore wind power generation. We have begun construction of Japan's first manufacturing plant for monopiles (foundation structure for offshore wind power generation) in Kasaoka City, Okayama Prefecture, and are preparing to start production in April 2024. We plan to use high-quality, large, and heavy steel plates manufactured by the No. 7 continuous casting machine in the Kurashiki district of the West Japan Works for construction material. Larger than conventional heavy steel plates, this product will improve work efficiency and lower manufacturing costs by requiring fewer welding operations, for bigger wind turbines that increase power generation and for other purposes. In the trading business, we will leverage the know-how accumulated in the steel, raw materials, and materials and machinery businesses to build a supply chain for steel materials and processed products for offshore wind power generation to offer optimal proposals to customers. All these efforts will benefit from leveraging the respective strengths of each operating company to expand Group synergies.

In the first half of FY2023, we also began supplying JGreeX™, an eco-friendly steel that generates significantly lower CO_2 emissions during manufacturing compared to conventional products. This is the world's first business model in which the entire supply chain bears the cost of creating environmental value by reducing CO_2. This business model is indispensable for the sustainable growth of the JFE Group, which intends to reduce CO_2 emissions through large-scale investments. These ongoing efforts are intended to establish a market in which customers recognize the value of green steel materials that contribute to realizing a carbon neutral society.

*1 Technology for converting CO_2 emitted from a blast furnace into methane, which is then blown into the blast furnace as a reductant

*2 Technology that uses hydrogen as a reductant instead of coal

Addressing Social Issues and Enhancing Corporate Governance

We also need to focus on social issues to continue to expand corporate value. In particular, since people are the heart of any company, we invest in human capital to provide safe working environments for employees and take action to maximize their abilities and vitality. The JFE Group adheres to the philosophy of safety first and promotes its initiatives by designating safety-related KPIs. We maintain a steadfast focus on preventing accidents by prioritizing safety investments of 10 billion yen per year for the entire Group. In addition, every company has established and is actively committed to operating a health and productively management system to safeguard the health of employees and their families.

Thriving in a rapidly changing business environment depends upon integrating various values and ways of thinking to discover novel ideas and solutions for sustainably enhancing corporate value. The JFE Group has positioned diversity and inclusion as a vital management concern and is working to establish an environment in which people with diverse backgrounds, including gender, nationality, values, and lifestyles, can demonstrate their abilities. Particularly with regard to

supporting female employees, following discussions by the Board of Directors, ambitious targets were set for our KPIs on promoting women to managerial positions and the ratio of hiring women and other under-represented groups starting in FY2022. These and other measures will inform our recruitment, retention, placement, and training activities.

In parallel with these efforts, we are also working to create an internal environment in which employees feel rewarded so that diverse human resources can demonstrate their abilities with enthusiasm. As part of this, we are promoting teleworking, improving office spaces, streamlining tasks, and revitalizing workplace communication through one-on-one meetings. In addition, JFE Holdings and its operating companies conduct annual engagement surveys to regularly assess employee awareness, identify issues related to job satisfaction, and consider measures to address them.

In our performance-linked remuneration system for directors, we introduced a key indicator for employee safety as a non-financial target in FY2022 and an indicator for climate change in FY2023. We examine and enhance the system on an ongoing basis to provide healthier incentives, which will lead to strengthened corporate governance or the sustainable growth of the Group.

Progress in the Medium-Term Plan

In FY2022, the second year of the medium-term plan, the steel business reported a year-on-year decline in earnings due to rising prices and supply-side restrictions, partly caused by the prolonged conflict in Ukraine, stagnant economic activity in China, rising concerns over global inflation, and appreciation in the yen's value. On the other hand, steady progress is underway in strengthening our revenue base by increasing the ratio of high value-added products, promoting the DX strategy, and shifting from quantity to quality. We will continue to build a solid revenue base that does not depend on volume or market conditions by strengthening the resilience of our production and engineering capabilities and enhancing the competitiveness of our products and services to achieve both environmental and social as well as economic sustainability.

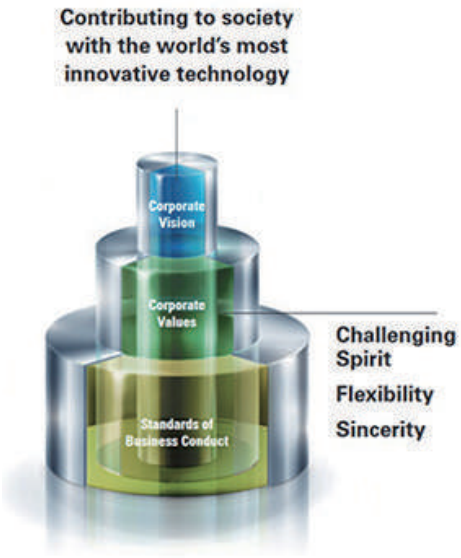
To Our Stakeholders

The JFE Group aspires to become a product and service provider that contributes to a prosperous future for the Earth for years to come. To this end, we will steadfastly ensure thorough legal and regulatory compliance as the foundation of a trusting relationship with society. At the same time, the Group will work in concert to address environmental issues such as climate change and biodiversity, as well as social issues such as occupational health and safety and diversity and inclusion, as opportunities for further growth.

Corporate Vision/Business Conduct

The JFE Group's corporate values and standards of business conduct are manifested in the company's vision of contributing to society with the world's most innovative technology. We proactively address critical issues regarding safety, disaster prevention, product quality, human rights, compliance, environmental protection and climate change.

The JFE Group considers the perspectives of all stakeholders, including customers, clients, shareholders, investors, community residents and employees, guided by a fair, objective and transparent system of corporate governance. In the spirit of its corporate values of Challenging Spirit, Flexibility and Sincerity, the JFE Group strives to earn society's trust by undertaking CSR with integrity.



JFE Group Standards of Business Conduct

All JFE Group personnel are required to faithfully adhere to the following Standards of Conduct in all corporate activities. These standards embody the JFE Group's Corporate Vision and go hand in hand with its Corporate Values. Senior managers are also responsible for measures to prevent the recurrence of any violation of these standards. Additionally, they must report violations promptly and accurately to internal and external stakeholders, determine the persons of relevant authority and accountability, and resolve matters rigorously.

1 Provide quality products and services

Earn the trust and acclaim of customers by endeavoring to provide safe, high-quality products and services based on superior technologies, and by fully respecting and protecting the privacy of personal and customer information. Also, leverage our superior technologies for the sustainable growth of our Group and society.

2 Be open to society

Disclose corporate information actively and engage in constructive dialogues with diverse stakeholders to enhance our corporate value.

3 Work with communities

Actively contribute to host communities as a good corporate citizen by emphasizing harmony and cooperation.

4 Globalize

Endeavor to achieve understanding with people around the world, working from a global perspective and with respect to international norms, and also local cultures and customs.

5 Exist harmoniously with the global environment

Actively work to exist harmoniously with the global environment, as well as to raise living standards and advance societies.

6 Maintain proper relations with governments and political authorities

Endeavor to build and maintain sound and proper relationships with governments and political authorities.

7 Maintain crisis readiness

Firmly resist all elements and organizations that threaten social order and stability, and refuse all illegal or improper demands. Also, contribute to order and safety in society by thoroughly and methodically preparing for crises such as terrorism, cyberattacks, natural disasters and others, including by ensuring the stable availability of products and services.

8 Respect human rights

Respect all employees and members of the general public as individuals and refrain from any discrimination in corporate activities.

9 Provide challenging work environments

Provide employees with attractive, safe, healthy and challenging work environments.

10 Comply with laws and ordinances

Comply with all applicable laws and ordinances, endeavor to compete fairly and freely, refrain from illegal business activities, promote sound business practices, and be faithful and sincere in all activities and dealings.

Value of Steel

Appealing Qualities of Steel that Create Safe, Comfortable Lives for a Prosperous Global Future

Iron makes up approximately 30% of the Earth's mass. Because of its rich reserves, steel can be mass produced at very low cost. Compared to other materials, the environmental impact of its production is extremely low and it has excellent recyclability. Steel can be recycled repeatedly and reborn as various products (closed-loop recycling) with little or no environmental impact, contributing to the sustainable growth of our society.

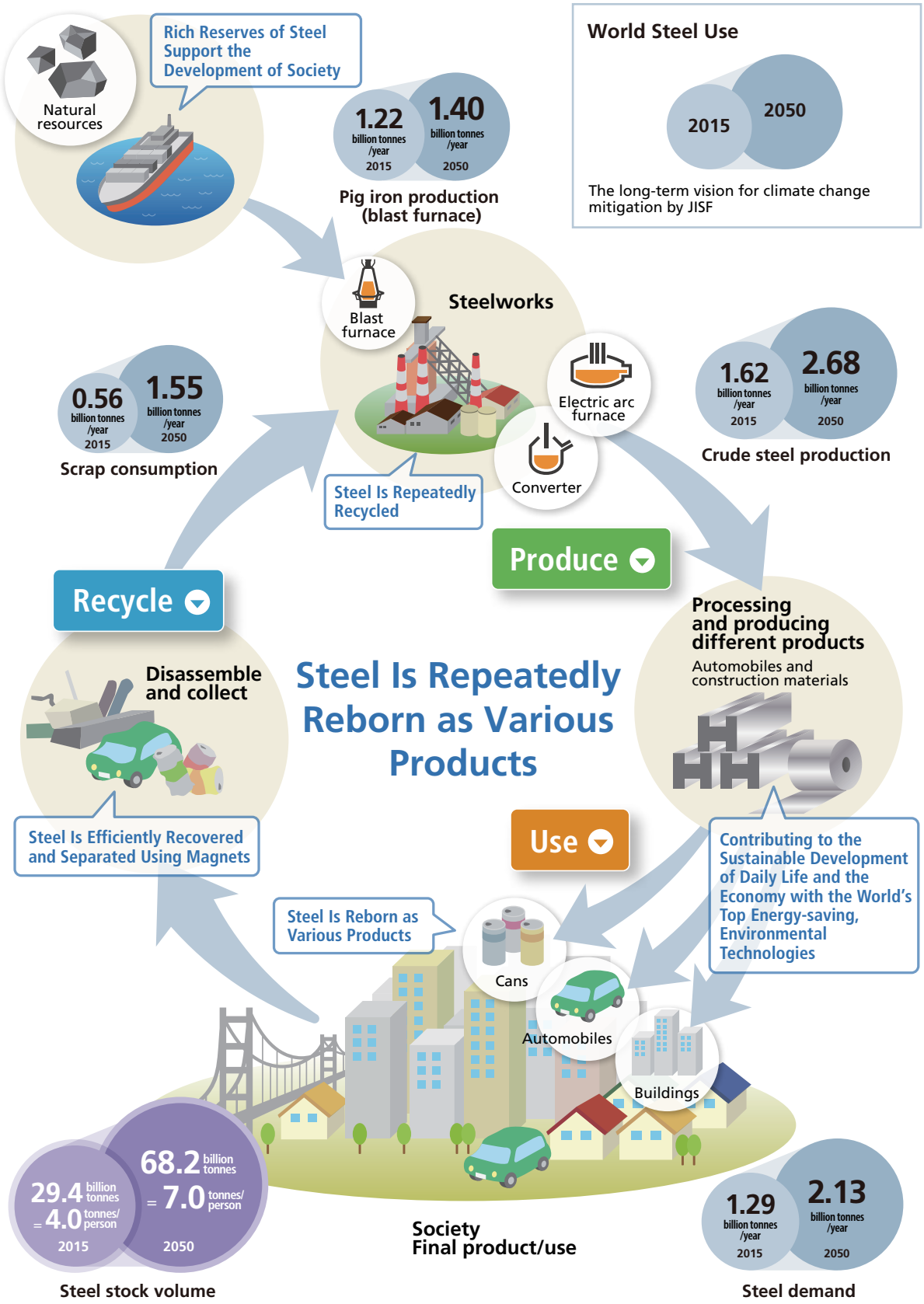
Life Cycle Assessment of Steel

Steel's excellent recyclability contributes to the creation of a sophisticated **value chain (P. 30)** encompassing three components: Produce, Use, and Recycle. Steel products can be repeatedly reborn as various products. It is therefore important that the environmental impact of steel be assessed across its entire life cycle, including at the recycling stage.JFE Steel participates as a key member in an initiative led by the Japan Iron and Steel Federation (JISF) to quantify the environmental impact of the entire life cycle of steel products and developed the ISO/JIS standard* calculation methodology. Corresponding to this standard, materials with higher recyclability are found to have lower environmental impact such as on global warming.

Fifteen blast furnace and electric arc furnace steel manufacturers operating in Japan, including JFE Steel, have compiled and published the national average value for life cycle inventory (LCI) data for different types of steel products for FY2018.

*ISO 20915: Life cycle inventory calculation methodology for steel products (November 2018),
JIS Q 20915: Life cycle inventory calculation methodology for steel products (June 2019)

➤ Contribution to the Development of Calculation in LCA (P.107)


Steel Is Repeatedly Reborn as Various Products
Rich Reserves of Steel Support the Development of Society
Natural resources
1.22 billion tonnes /year 2015
1.40 billion tonnes /year 2050
Pig iron production (blast furnace)
World Steel Use
2015
2050
The long-term vision for climate change mitigation by JISF
Steelworks
Blast furnace
Electric arc furnace
Converter
Steel Is Repeatedly Recycled
0.56 billion tonnes /year 2015
1.55 billion tonnes /year 2050
Scrap consumption
1.62 billion tonnes /year 2015
2.68 billion tonnes /year 2050
Crude steel production
Produce
Recycle
Processing and producing different products
Automobiles and construction materials
Disassemble and collect
Steel Is Efficiently Recovered and Separated Using Magnets
Use
Contributing to the Sustainable Development of Daily Life and the Economy with the World's Top Energy-saving, Environmental Technologies
Steel Is Reborn as Various Products
Cans
Automobiles
Buildings
Society
Final product/use
29.4 billion tonnes = 4.0 tonnes/person 2015
68.2 billion tonnes = 7.0 tonnes/person 2050
Steel stock volume
1.29 billion tonnes /year 2015
2.13 billion tonnes /year 2050
Steel demand

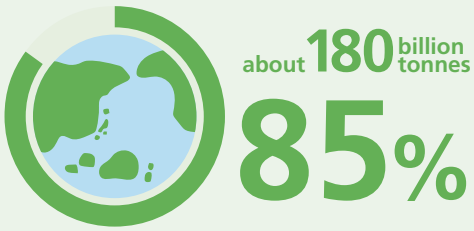
Produce High Economic Efficiency and Low Environmental Impact

The stable mass production of steel serves as the foundation for daily life and society. CO_2 generated by the manufacturing process of steel is extremely low compared to other materials, making it an environmentally sound material. Steel is an essential for society's sustainable development and to create safe, comfortable lives for people everywhere.

Earth, a Planet of Iron (Abundant Resources)

As much as 85% of the Earth's metal resources are iron ore (180 billion tonnes).

Recoverable Reserves of Iron Ore on the Earth

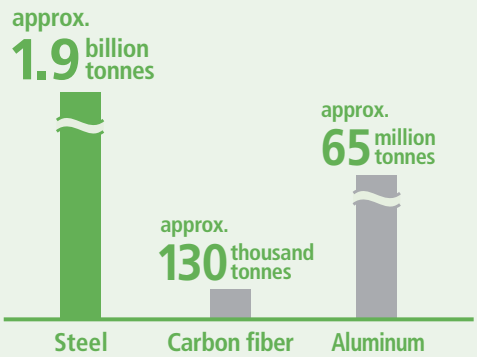


Source: Mineral Commodity Summaries (2023)

Mass Production at Low Cost

With rich reserves and a long history of technological development, iron is mass produced at reasonable prices and supplied stably, thereby contributing to the sustainable growth of society.

Global Demand (2020)



Research: JFE Holdings

Price*

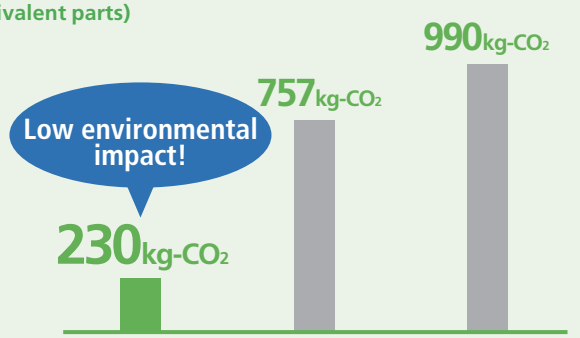
Research: JFE Holdings

*Cost of producing one unit weight of iron is indexed at 1 for comparison with other materials.

Extremely Low Environmental Impact at the Manufacturing Stage when Compared to Other Materials

Greenhouse gas (GHG) emissions of steel at the manufacturing stage is approximately one-fourth to one-fifth of that of aluminum and carbon fiber with equivalent functionality.

GHG Emissions at the Manufacturing Stage of Materials (CO_2 equivalent)
(kg-CO_2/100 kg of steel equivalent parts)



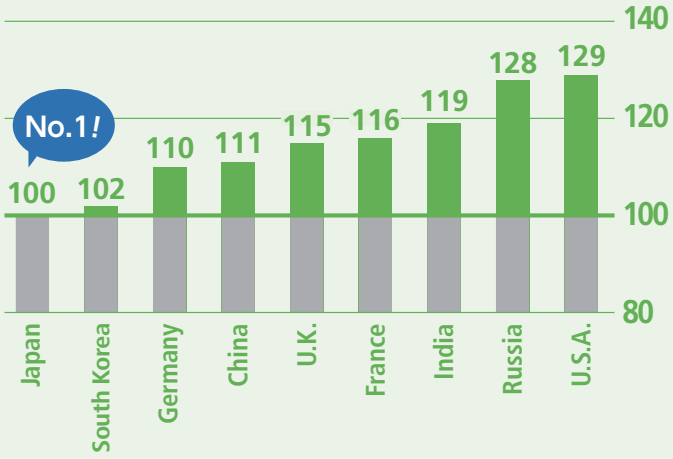
	Steel (mild steel)	Aluminum	CFRP Carbon Fiber Reinforced Plastic
GHG emissions per unit weight (CO_2 equivalent) (kg-CO_2/kg)	2.3	11.3	22.0
Functional equivalent weight (kg)	100	67	45

Source: Compiled from data disclosed by WorldAutoSteel

Japan's Steel Industry Boasts the Highest Energy Efficiency in the World

Japan's steel industry (converter steel) produces steel with the lowest environmental impact compared to other major countries. This is a result of its longstanding efforts toward environmental conservation, including developing and spreading the use of energy-saving technologies.

World's Quotient, with Japan as 100 (2019)



Source: Research Institute of Innovative Technology for the Earth (RITE)

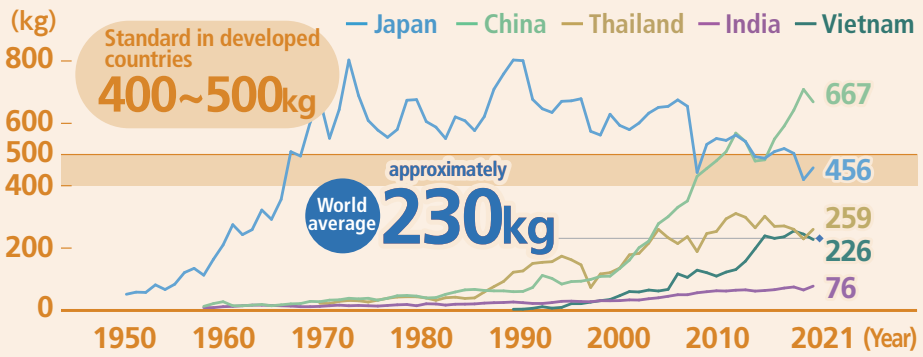
Use Foundation of Daily Life and Society

The use of steel impacts the environment less than other materials. For example, making automobile frames with high tensile strength steel sheets, which have a reduced thickness but retain their strength, considerably decreases the weight while maintaining crash performance, thereby helping to reduce CO_2 emissions for society as a whole.

Potential to Grow on a Global Scale

Global average of annual consumption of steel is approximately 230 kg per capita. The long-term global demand for steel is expected to keep growing alongside the economic development of emerging countries.

Trends in Annual Steel Consumption per Capita by Country (kg/person/year)

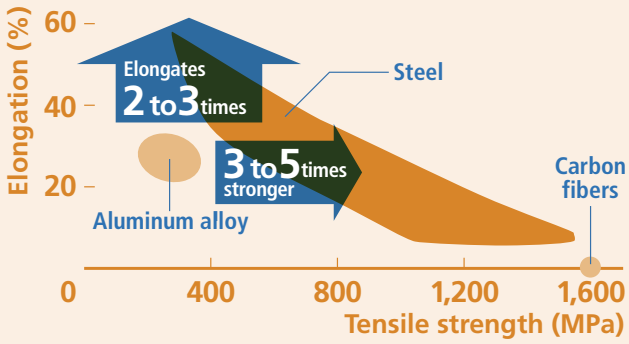


Source: World Steel Association

Potential for Evolution

Steel can be elongated two to three times more than aluminum at the same rigidity and is three to five times stronger at the same extended rate, making it the optimal material for new world-class structures such as TOKYO SKYTREE. And yet there is still potential for further evolution. The emerging needs of society will advance the development of steel and contribute to a productive future.

Comparison of Strength and Elongation between Steel, Aluminum, and Carbon Fiber



Research: JFE Holdings

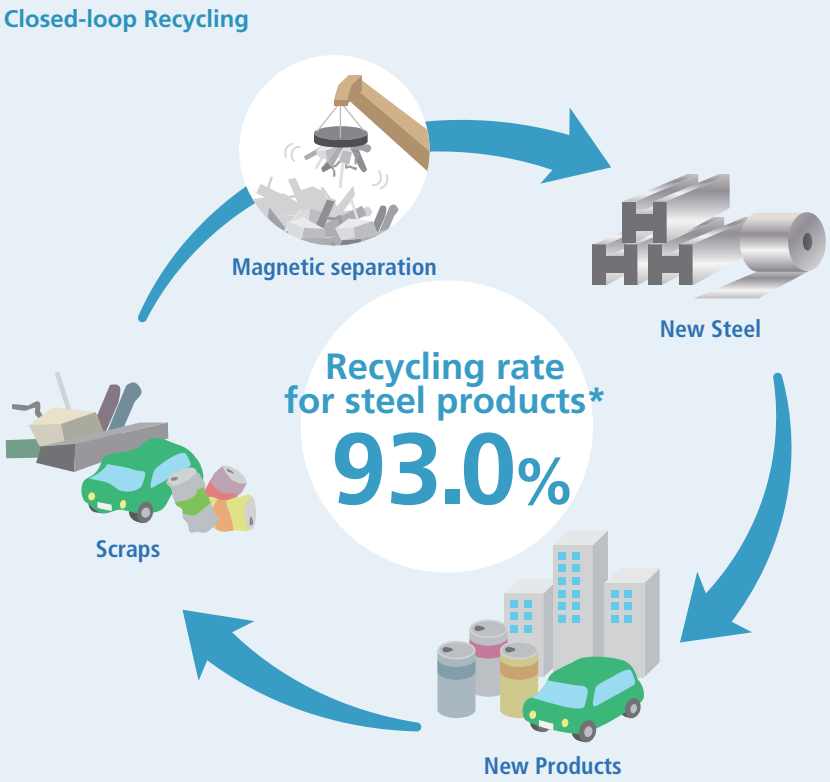
Recycle Excellent Recyclability

Steel is a highly recyclable material that can be easily recovered and separated using magnets. It can be efficiently recovered, separated, and recycled into high-quality, high-functioning products over and over again through closed-loop recycling.

Closed-loop Recycling of Steel

Steel can be recycled a number of times as a raw material for steel products while retaining its original properties. Closed-loop recycling is superior to open-loop recycling* in terms of sustainability, because closed-loop recycling reduces the consumption of natural resources, as well as the amount of environmentally hazardous substances and wastes.

*In open-loop recycling, the material recycling process involves two types of finite recycling which are thermal recycling and cascade recycling. Thermal recycling means that heat generated by incineration is recovered while cascade recycling indicates recycling the material accompanied by the degradation or alteration of the material's properties.



Source: The Japan Iron and Steel Federation

Progress of the Seventh Medium-term Business Plan

In FY2021, the JFE Group formulated the Seventh Medium-term Business Plan for FY2021 through FY2024 to steadily increase corporate value over the medium to long term. Recognizing that the four years covered by the plan will be the most transformative period in the Company's history, we will establish a robust foundation for sustained, long-term growth while steadfastly taking on the challenge of transformation to become an essential part of the sustainable development of society and the safe and comfortable lives of people. We are working to ensure environmental and social sustainability by promoting initiatives addressing climate change issues as outlined in the JFE Group Environmental Vision for 2050 and implementing initiatives for promoting employee success, contributing to local communities, and ensuring respect for human rights throughout the supply chain. We are also striving to ensure economic sustainability based on stable profitability by completing structural reforms and promoting DX strategies in the steel business to raise cost competitiveness. And we are viewing advances in decarbonization as opportunities for pursuing business growth strategies, such as supplying high-performance electrical steel sheets and other products with high added value and expanding renewable power generation.

➤ Seventh Medium-term Business Plan (CSR Report 2021) (https://www.jfe-holdings.co.jp/en/csr/pdf/csr2021e.pdf)

Status of Initiatives for the Seventh Medium-term Business Plan

Ensure Environmental and Social Sustainability

Addressing Climate Change Issues

The JFE Group considers addressing climate change as a vital management concern and upholds the **JFE Group Environmental Vision for 2050** for realizing carbon neutrality by focusing on strategies for reducing CO_2 emissions in its steel business as well as in society as a whole. In FY2022, we reduced CO_2 emissions in the steel business by 13% from FY2013 and will continue our efforts to achieve the target under the medium-term plan of reducing emissions by at least 18%. We are also expanding the construction and operation of plants for renewable energy power generation, waste-to-energy power generation, along with other efforts in the engineering business, which contributed to reducing 11.14 million tonnes of CO_2 emissions in society as a whole in FY2022, as we make steady progress toward achieving our mid-term target of reducing emissions by 12.00 million tonnes.

In the steel business, we intend to reduce CO_2 emissions by at least 30% in FY2030 from FY2013 and to achieve carbon neutrality by 2050. In FY2022, we took our first step forward by formulating a more specific CO_2 reduction plan*1 which positions the timeframe up to 2030 as the transition period for shifting to a low-carbon steel process and the timeframe up to 2050 as the innovation period, during which we will establish and implement ultra-innovative technologies and strive for carbon neutrality. In order to achieve the goal of reducing emissions by 30% or more by FY2030, we expanded the use of scrap in converter furnaces by introducing the eco-friendly Double-slag Refining Process (DRP®) in all districts, which will significantly reduce CO_2 emissions. In addition, we decided to reinforce the electric arc furnace at the Sendai Works and to incorporate an electric furnace in stainless steel manufacturing in the Chiba district. In the Kurashiki district, we are considering installing high-efficiency electric arc furnaces to coincide with the renovation of the blast furnace, and we will execute the necessary capital investment to achieve these goals. With the support of the NEDO Green Innovation Fund Project, we have been simultaneously developing ultra-innovative technologies with the aim of achieving carbon neutrality in 2050. In the Chiba district, we began construction of test facilities for the carbon recycling blast furnace*2, and we will accelerate research and development toward the early implementation of ultra-innovative technologies.

We also decided to start supplying JGreeX™, an eco-friendly steel material that generates significantly lower CO_2 emissions during the manufacturing process compared to conventional products, and plan to supply approximately 200,000 tons in FY2023. We will actively work to establish a market in which customers recognize the value of green steel materials that contribute to realizing a carbon neutral society.

In the area of contributing to the reduction of CO_2 emissions in society as a whole, we decided to invest in the Kurashiki district to triple the current production capacity of electrical steel sheets to improve the efficiency of motors and transformers for EVs, and we reached a basic agreement overseas with JSW Steel in India to establish a production and sales joint venture for (grain-oriented) electromagnetic steel sheets. In addition to expanding renewable energy power generation and other businesses in the engineering business, the entire Group is working to commercialize offshore wind power generation. In FY2022, we began construction on a manufacturing plant for monopiles in Kasaoka City, Okayama Prefecture, to establish a system for manufacturing and supplying foundation structure for offshore wind power generation. By expanding the supply of Eco-friendly Products and renewable energy-related businesses, we will contribute reducing CO_2 emissions in society as a whole.

➤ *1 Roadmap to Carbon Neutrality (P.53)

*2 Technology for converting CO_2 emitted from a blast furnace into methane, which is then blown into the blast furnace as a reductant

Addressing Social Issues

For the JFE Group to achieve sustainable growth in the future, addressing social as well as environmental issues is essential. We are implementing human rights due diligence toward the realization of a society where human rights are respected and protected. We also revised the JFE Group Basic Policy on Human Rights in April 2023 to further intensify these efforts as part of our ongoing commitment to ensure respect for human rights for all stakeholders, including those in our supply chain.

Ensuring the safety and health of employees is a fundamental requirement for corporate activities, and with regard to safety in particular, we are focused on initiatives for eliminating major accidents by making our facilities safer. As planned, we made safety investments of about 10 billion yen per year for the entire Group in FY2022. Meanwhile, we are promoting initiatives on diversity and inclusion and workstyle reform to maximize the capabilities of employees with diverse backgrounds. In FY2022, we advanced our efforts by setting more ambitious KPIs for hiring female employees and increasing the ratio of female managers. We will consistently invest in human capital to secure and nurture diverse human resources and create working environments and systems that enable employees to feel pride in their work and fully demonstrate their abilities.

Starting in FY2022, we will calculate performance-linked remuneration for Directors based on non-financial indicators related to the environment and society in addition to existing financial indicators. In FY2022, we introduced indicators related to employee safety. We have also decided to introduce indicators for climate change beginning in FY2023 as an incentive to accelerate efforts in this area, which we recognize as a top priority.

We will actively promote initiatives addressing ESG issues, particularly climate change, and contribute to the realization of a sustainable society to ensure environmental and social sustainability as set forth in our medium-term plan.

Ensure Environmental and Social Sustainability

Progress in Shift from Quantity to Quality and Structural Reforms

In FY2022, we continued to steadily implement the key measures of the medium-term plan to establish economic sustainability. In the steel business, we improved sales pricing by reflecting fluctuations in raw material costs and higher prices in various goods, and correcting price levels, which led to a significant improvement of 74.0 billion yen (3,000 yen/ton) over the previous fiscal year. The ratio of high value-added products increased by 2% from the previous year to 47%, showing steady progress toward the 50% target of the mid-term plan. We will strive to increase the ratio of high value-added products and further improve sales prices and spreads by expanding sales in the key areas of high tensile strength steel sheets for automobiles, electrical steel sheets, and construction materials for infrastructure. With regard to structural reforms, we suspended operations at facilities for steel sheets used in cans in the Chiba district and completed consolidating production to the Fukuyama district. We also renovated and relaunched the blast furnace in the Chiba district. In September 2023, we plan to suspend the upstream process in the Keihin area and will complete structural reforms to promote the shift from quantity to quality. We are also making steady progress in land use in the Keihin area after the structural reform. We selected a project partner for the northern side of the Minami-Watarida-Kita area and decided to sell our land in Ogimachi. Furthermore, following the announcement of Kawasaki City's land use policy, we plan to announce our own land use policy for Ogishima in September 2023.

Promoting Growth Strategies

In August 2023, we signed an official agreement for the **establishment of a production and sales joint venture for (grain-oriented) electromagnetic steel sheets with JSW Steel in India.** We are further developing our strategy based on localized production. In addition, we are focusing on winning orders for our solutions business, which provides technological, operational, and research know-how for manufacturing high-value-added products and reducing environmental impact. By steadily implementing these initiatives, we raised the earnings target for the steel business under the medium-term plan by 30 billion yen from the initial plan to 260 billion yen. In the engineering business, while segment profit for FY2022 declined due to the soaring prices of materials and equipment, orders received reached a record high of 564.9 billion yen. The trading business posted a record-high segment profit of 65.1 billion yen in FY2022, reflecting our commitment in both businesses to achieve further growth against the medium-term plan.

Promoting DX Strategy

Our medium-term plan positions **DX as a key for accomplishing the greatest transformation since our founding.** In FY2022, we pursued initiatives including expanded deployment of an anomaly detection system using data science technology for facilities in our steel business. In addition to existing internal optimization efforts such as business reforms and improved productivity, we will seek to deliver added value to external parties and create new businesses utilizing DX. We will leverage the rapid and drastic changes taking place around us as growth opportunities. For example, we began offering the RODAS® packaged service for boiler power plants as a new business that won the Energy Conservation Grand Prize for 2022. We have confidently progressed in our plan to invest a total of around 120 billion yen in DX over the four-year period, executing nearly 50% of this investment in FY2022. We will also take such actions as shifting to a cyber physical system (CPS) in the steel business and business process reform utilizing digital technology in the engineering business.

Balancing Effective Investment and Financial Soundness

Aggressive management for medium- to long-term growth requires the establishment of a stable financial base. To this end, we must **balance effective investment based on a "select and concentrate" approach to ensure sufficient profitability and financial soundness.** The balance of interest-bearing debt at the end of FY2022 was 1,862.9 billion yen, an increase of 13.5 billion yen from the previous fiscal year. The Debt/EBITDA ratio, which is the financial target of the medium-term plan, was 3.7 times higher. Taking into account the accumulation of cash and deposits, however, the net position between interest bearing debt and cash and deposits was a decrease of about 4 billion yen from the previous fiscal year. The D/E ratio was 67.8%, achieving the mid-term plan target of around 70% two years ahead of schedule. We will continue to secure the necessary funding for investments while ensuring financial soundness by reviewing businesses and assets to thoroughly reduce assets and by improving the cash conversion cycle to reduce inventories.

The JFE Group will complete the measures set forth in the medium-term plan to achieve sustainable growth, enhance corporate value over the medium to long term and overcome difficulties by quickly and accurately responding to unpredictable, rapid changes in the business environment.

■ JFE Group's Performance and Profitability Targets, Dividend Policy, FY2022 Results, and FY2023 Forecast

Performance and profitability targets	Seventh Medium-term Business Plan (final year: FY2024)	FY2022 Results	FY2023 Forecast
Consolidated business profit (excluding steel business inventory valuation difference, etc.)	320.0 billion yen	235.8 billion yen (162.8 billion yen)	290.0 billion yen/year (315.0 billion yen)
Profit attributable to owners of parent	220.0 billion yen	162.6 billion yen	190.0 billion yen
ROE	10%	7.9%	8.7%
Debt/EBITDA	About 3 times	3.7 times	—
D/E ratio	About 70%	67.8%	—

Dividend policy	Seventh Medium-term Business Plan	FY2022 Results	FY2023 Forecast
Payout ratio	About 30%	28.5% (80 yen)	30.6% (100 yen)

■ Performance and Profitability Targets, FY2022 Results, and FY2023 Forecast for Operating Companies

Performance and profitability targets for operating companies		Seventh Medium-term Business Plan (final year: FY2024)	FY2022 Results	FY2023 Forecast
Steel business	Per ton profit (excluding inventory valuation difference, etc.)	10,000 yen/tonnes	7,000 yen/tonnes (3,000 yen/tonnes)	9,000 yen/tonnes (10,000 yen/tonnes)
	Segment profit (excluding inventory valuation difference, etc.)	230.0 billion yen	146.8 billion yen (73.8 billion yen)	200.0 billion yen (–225.0 billion yen)
Engineering business	Segment profit	35.0 billion yen	13.4 billion yen	25.0 billion yen
	Sales revenue	650.0 billion yen	512.5 billion yen	550.0 billion yen
Trading business	Segment profit	40.0 billion yen	65.1 billion yen	48.0 billion yen

■ Investment and Asset Downsizing Plans, Cumulative Results up to FY2022

Content		Seventh Medium-term Business Plan (four-year total)	Cumulative Results for FY2021 and FY2022
Investment	Total capital expenditures, investment and loans	Approx. 145.00 billion yen	Adopted around 50% of plan
	GX investment*1	Approx. 340.0 billion yen	Adopted around 40% of plan (investments related to offshore wind power-business, expansion in production facility for grain-oriented electromagnetic steel sheets, other)
	DX investment*2	Approx. 120.0 billion yen	Adopted slightly more than 50% of plan(system upgrades at steelworks)
Asset downsizing		Approx. 200.0 billion yen	87.0 billion yen

*1 GX investment: Investments for green transformation.
*2 DX investment: Investments for digital transformation.

Material Issues of Corporate Management

Action on Material Issues

The JFE Group's actions related to management issues are based on identifying materiality and setting KPIs to minimize negative societal impact and maximize societal value by investing JFE Group's resources from the standpoint of meeting stakeholder needs. In 2016, we determined our material CSR issues (13 issues in 5 focus areas)by comprehensively identifying 35 issues that reflect society's expectations in the context of JFE's business and then by prioritizing the issues through the two criteria of stakeholder expectations and relevance to business (societal impact).

In FY2021, we formulated the Seventh Medium-term Business Plan, recognizing that ensuring environmental and social sustainability (helping to solve critical issues) and establishing economic sustainability (stable earnings power) are key to the JFE Group's sustainable development. Accordingly, **we reorganized our materiality by adding economic issues to our existing CSR issues to identify all our material issues of corporate management.** We will demonstrate the Group's vision of "contributing to society with the world's most innovative technology" by working in concert to address these issues.

Process for Identifying Material Issues of Corporate Management

The JFE Group has been promoting actions that address the material CSR issues identified in 2016 (13 issues in 5 focus areas).

Refer to the following on how we identified material CSR issues up to FY2020.

➤ Material CSR Issues (CSR REPORT 2020) (https://www.jfe-holdings.co.jp/en/csr/pdf/csr2020e.pdf)

In FY2021, the material issues of corporate management were identified through the following process.

STEP 1. Reassessment of Existing Material CSR Issues

The material CSR issues identified in 2016 were reassessed for their importance in terms of relating to current operations, stakeholder expectations and achievement of KPIs.

STEP 2. Setting of Material Economic Issues

Based on discussions at each operating company, major strategies in the Seventh Medium-term Business Plan were grouped together with the sources of competitive advantages in the JFE Group's business model, and economic-related issues were clarified for the economic sustainability of the Group.

- Source of Competitive Advantage
  Steel and Trading Businesses: Production; Sales; and Technological Development
  Engineering Business: Engineering, Procurement, and Construction; Sales; and Technological Development

STEP 3. Selection of 20 Material Issue Candidates

Economic-related issues were added to the list of reassessed CSR issues, and their appropriateness as issues for the JFE Group was deliberated by the Group Management Strategy Committee, screening out 20 material issue candidates.

20 Candidates for Material Issues

- Achieve carbon neutrality by 2050
- Provide eco-friendly businesses and products
- Protect the global atmosphere
- Pursue resource recycling
- Prevent workplace accidents
- Ensure the health of employees and their families
- Pursue diversity and inclusion
- Strengthen human resources development
- Implement workstyle reform
- Increase efficiency and enhance cost competitiveness in production and EPC
- Stable supply of products and services
- Ensure quality
- Increase the added value of products and technologies
- Bolster sales capabilities
- Meet customer needs
- Develop and expand the base of our growth businesses
- Develop cutting-edge technology
- Ensure financial soundness
- Ensure adherence to corporate ethics and compliance
- Respect the human rights of each person involved in our business

STEP 4. Identification of the of the most important 13 Material Issues

The Group Management Strategy Committee and Board of Directors deliberated on the 20 candidate issues, and narrow them down by identifying the most important 13 material issues for the current JFE Group.

- Reduce the JFE Group's CO_2 emissions
- Contribute to reduction of CO_2 emissions across the society
- Prevent workplace accidents
- Ensure the health of employees and their families
- Pursue diversity and inclusion
- Strengthen human resources development
- Create workplaces that motivate employees
- Increase efficiency and enhance cost competitiveness in production and engineering
- Raise quality of products and services and ensure reliable supply
- Expand business by increasing value added in products and services with advanced technologies
- Sales strategies for realizing sustainable growth
- Ensure adherence to corporate ethics and compliance
- Respect human rights throughout the supply chain

Contribution to the Sustainable Development Goals (SDGs)

In September 2015, a UN Summit adopted 17 SDGs to be addressed through worldwide efforts to achieve sustainable development. The JFE Group will respond to global community needs and contribute to SDGs through our initiatives on material issues of corporate management.

Corporate Vision: Contributing to Society with the World's Most Innovative Technology

	Areas of Focus	Details	Scope of Influence	Material Issues	Relevant SDGs
Activity	Contribute to resolving climate change issues (initiatives for achieving carbon neutrality by 2050)	•Initiatives for achieving carbon neutrality by 2050 ・Reduce the JFE Group's CO_2 emissions ・Contribute to reduction of CO_2 emissions in society	JFE Group Local communities near manufacturing sites Customers Society	Reduce the JFE Group's CO_2 emissions Contribute to reduction of CO_2 emissions across the society	6 7 9 12 13 14
	Ensure occupational safety and health	•Prioritize safety first •Maintain the physical and mental health of employees and their families	JFE Group Suppliers Business partners	Prevent workplace accidents Ensure the health of employees and their families	3 8
	Recruit and nurture diverse human resources	•Maintain work environments where all personnel can maximize their abilities •Accumulate and hand down technologies and skills	JFE Group Business partners	Pursue diversity and inclusion Strengthen human resources development Create workplaces that motivate employees	4 5 8 9 10
	Reinforce resilience of production and engineering capabilities (realize world-class earnings power through DX and other measures)	•Pursue **world-class earnings power** •**Promote DX** and other measures to improve production efficiency, yields, and labor productivity ・Shift focus of steel business from **quantity to quality (structural reform)** ・Reduce costs to strengthen cost competitiveness and ensure quality competitiveness	JFE Group Customers Society	Increase efficiency and enhance cost competitiveness in production and engineering Raise quality of products and services and ensure reliable supply	9 10 11 12
	Strengthen competitiveness of products and services (promote the growth strategy by providing high value-added solutions)	•**Improve margins** and ensure stable earnings power ・Increase ratio of **high value-added products and services** ・Ensure stable earnings power based on the sales strategy, including **technological solutions** and **expansion of growth businesses**	JFE Group Customers Society	Expand business by increasing value added in products and services with advanced technologies Sales strategies for realizing sustainable growth	7 9 11 12 13 17
Basis of activity	Thoroughly enforce compliance		JFE Group Suppliers Political authorities Society	Ensure adherence to corporate ethical standards and compliance	10 16
	Respect human rights			Respect human rights across the supply chain	

Increased corporate value and sustainable growth

Goals

Contribute to realizing sustainable societies

Corporate Governance (Ensure Fairness, Objectivity and Transparency)

Respect and Maintain Awareness of Human Rights

KPIs for Material Issues of Corporate Management

Performance Evaluation for FY2022 KPIs and Establishment of FY2023 KPIs

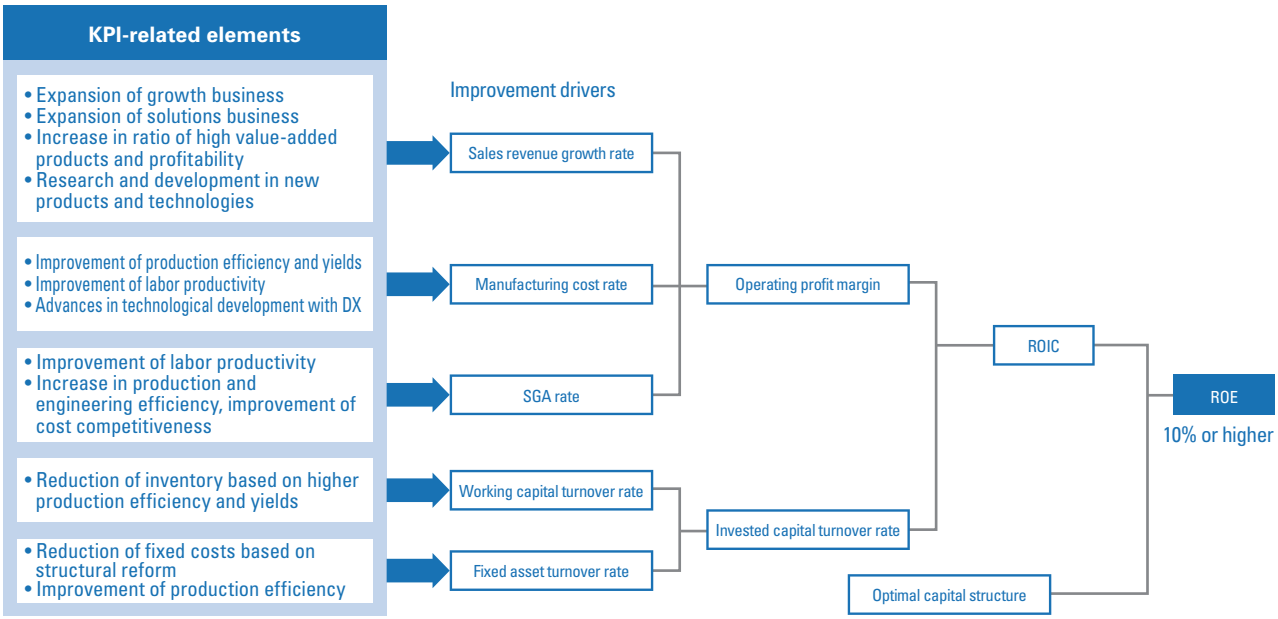
We assessed the performance of KPIs for FY2021 that were established to address material issues of corporate management identified in FY2022 and established KPIs for FY2023 based on the results of the evaluation and third-party opinions. FY2022 performance and KPIs for FY2023 were finalized following discussions by the Management Committee and other organs of each operating company and deliberation by the Group Management Strategy Committee and Board of Directors. Going forward, the Group will continue to work in concert to set KPIs that reflect the characteristics and realities of each operating company and effectively implement the PDCA cycle to promote its initiatives.

➤ Material Issues of Corporate Management and KPIs (P.20)

Enhancing ROE by Achieving the KPIs

The KPIs for each material issue are closely tied to the financial targets. Achieving the KPIs for each issue affects various drivers of improvement, leading to the achievement of the financial target (10% or higher ROE) and results in increasing corporate value over the medium to long term. The connection between these initiatives for material issues and financial targets is deeply shared at operating companies and on the front lines, increasing the effectiveness of these initiatives.

■ Connection between KPI-related Elements and Financial Targets



Material Issues of Corporate Management and KPIs

Evaluation criteria

Target attributes		○	△	×
Quantitative	Set for each fiscal year	Accomplished 100% or better	Accomplished 80%–99%	Accomplished 79% or less
	Set medium- to long-terms (in case of setting a multi-year target)	Final target accomplished 100% or better	Final target partly accomplished with some results (80% or better with linear interpolation).	Working toward the goal but no results yet (79% or less with linear interpolation).
Qualitative		Fully accomplished with significant results.	Partly accomplished with some results.	Working toward the goal but no results yet.

*1 In Groupwide evaluations, the lowest result among the companies is taken as the overall result.
*2 Prevention of occupational injuries evaluated as Groupwide (safety performance)

ST JFE Steel EN JFE Engineering SH JFE Shoji

Areas of Focus		Material Issues	Operating Company	FY2022 KPIs	Initiatives and Results for FY2022	Assessment	FY2023 KPIs
Activity	Contribute to resolving climate change issues (initiatives for achieving carbon neutrality by 2050)	Reduce the JFE Group's CO_2 emissions	ST	• Achieve 50% of the CO_2 reduction target from energy conservation and technological development for the target of reducing CO_2 emissions by 18% from FY2013 levels by the end of FY2024 • Complete the approval of investment plans for reducing CO_2 emissions by 90% cumulatively for CO_2 reduction targets from energy conservation and technological development for the target of reducing CO_2 emissions by 18% from FY2013 levels by the end of FY2024 • Formulate a CO_2 reduction plan aimed at realizing the CO_2 reduction target for FY2030 (30% or more) with an eye on achieving carbon neutrality by 2050	• CO_2 reduction target: 58% achieved	○	• Achieve 75% of the CO_2 reduction target from energy conservation and technological development for the target of reducing CO_2 emissions by 18% from FY2013 levels by the end of FY2024 • Complete the approval of capital investment plans for reducing CO_2 emissions by 100% cumulatively for CO_2 reduction targets from energy conservation and technological development for the target of reducing CO_2 emissions by 18% from FY2013 levels by the end of FY2024 • Obtain third-party certification, and build a green steel supply structure in the first half of FY2023
					• Total investment budget: 88% approved	△	
					• CO_2 reduction target: Set multiple targets that anticipate future changes in the environment	○	
			EN	• Reduce CO_2 emissions in its own plants and offices FY2024: 40% reduction from FY2013 levels	• 48% reduction from FY2013 levels (FY2013: 15,600 tons, FY2022: 8,100 tons)	○	• Reduce CO_2 emissions in its own plants and offices FY2023: 40% reduction from FY2013 levels
			SH	• Reduce CO_2 emissions through the procurement of electricity derived from renewable energy FY2022 domestic CO_2 emissions: Reduce by 10% from FY2019 levels (Reduce by 5% per year from FY2019 levels from FY2021 to FY2024)	• 11.2% reduction from FY2019 levels	○	• Reduce CO_2 emissions through the procurement of electricity derived from renewable energy FY2023 domestic CO_2 emissions: Reduce by 15% from FY2019 levels (Reduce by 5% per year from FY2019 levels from FY2021 to FY2024)
		Contribute to reduction of CO_2 across the society	ST	• Launch sales and implement eco-friendly products and technologies*: 15 or more cases in FY2022 (the cumulative total of 60 or more cases for the period from FY2021 to FY2024) * Products and technologies that contribute to saving energy and resources, reduce waste and environmentally hazardous substances, and do not require hazardous substances for manufacturing or use.	• FY2022: 16 (eco-friendly products: 7, technologies: 9) (FY2021–FY2024: 32)	○	• Launch sales and implement eco-friendly products and technologies: 15 or more cases in FY2022 (the cumulative total of 60 or more cases for the period from FY2022 to FY2024)
			EN	• Contribute to reduction of CO_2 in society by providing renewable energy power generation facilities and expanding the basis of the recycling business (for plastic, food, etc.) Contribute to reduction in CO_2 emissions (FY2022): 11 million tons per year	• CO_2 reduction contribution (FY2022): 11.14 million tons/year	○	• Contribute to reduction of CO_2 in society by providing renewable energy power generation facilities and expanding the basis of the recycling business (for plastic, food, etc.) Contribute to reduction in CO_2 emissions (FY2023): 11.5 million tons per year
			SH	1. Global resource recycling of steel scrap FY2022 scrap transactions: Above the transaction quantity for FY2020 (FY2024 target: +5% from FY2020)	1. Global resource recycling of steel scrap • 14% reduction from FY2020 levels Domestic volume expanded to meet increasing electric arc furnace demand, but sales volume declined as overseas demand weakened	×	1. Global resource recycling of steel scrap FY2023 scrap transactions: Above the transaction quantity for FY2020 (FY2024 target: +5% from FY2020)
				2. Increase transaction quantity of fuel for biomass power generation plants and create framework for reliable supply of fuel • FY2022 biomass fuel (palm kernel shells and wood pellets) transactions: Above the transaction quantity for FY2020 (FY2024 target: 100% increase from FY2020) • Diversify supply sources to ensure stable supply	2. Increase transaction quantity of fuel for biomass power generation plants and create framework for reliable supply of fuel • Volume handled: +25% compared with FY2020 levels • Diversify supply sources: Started transactions with three new suppliers	○	2. Increase transaction quantity of fuel for biomass power generation plants and create framework for reliable supply of fuel • FY2023 biomass fuel (palm kernel shells and wood pellets) transactions: Above the transaction quantity for FY2020 (FY2024 target: 100% increase from FY2020) • Diversify supply sources to ensure stable supply

Areas of Focus		Material Issues	Operating Company	FY2022 KPIs	Initiatives and Results for FY2022	Assessment	FY2023 KPIs
Activity	Ensure occupational safety and health	Prevent workplace accidents	Groupwide	Groupwide Workplace fatalities: Zero occurrences • Lost-workday injuries rate ST 0.10 or less EN 0.25 or less SH 0.45 or less	Groupwide Workplace fatalities: 1 occurrence • Lost-workday injuries rate ST 0.18 EN 0.26 SH 0.25	×*	Groupwide Workplace fatalities: Zero occurrences • Lost-workday injuries rate ST 0.10 or less EN 0.25 or less SH 0.45 or less
			ST	[Key measures] (1) Enhance safety Install electromagnetic locks at the secondary mill entrances: 60% by FY2022, 100% by FY2024 (2) Restructure the safety and health management system ISO 45001 certification in all districts: 100% by FY2022	[Key measures] (1) Installed electromagnetic locks at the secondary mill entrances: 81% (2) ISO 45001 certification: 100%		[Key measures] (1) Reinforce activities to prevent similar injuries Horizontal Companywide deployment of measures, including for close calls, promote workplace activities so employees view past incidents as lessons to learn from (2) Enhance safety Install electromagnetic locks at the secondary mill entrances: 90% by FY2023, 100% by FY2024
			EN	[Key measures] (1) Implement 100% of the following key points for eliminating falling and tumbling, getting wedged between or caught in machinery, and being struck by flying or falling objects • Pre-operation checks (curing openings in high locations and edges of work floor, ensuring on-site understanding of work plans, and covering and enclosing/turning off of machinery) • Strict adherence during operations (use of safety belts, no entry measures/allocation of worksite guides) (2) Multifaceted management of occupational safety and health using IT • Complete development of an AI-based system for detecting intruders (plan)	[Key measures] (1) Focused efforts on pre-operation checks of work plans and offering guidance, checking safety equipment, and preventing unsafe behavior through patrols in order to implement 100% of the following key points for eliminating falling and tumbling, getting wedged between or caught in machinery, and being struck by flying or falling objects (Workplace fatalities: 1 occurrence in FY2021→Zero occurrences in FY2022) (2) Multifaceted management of occupational safety and health using IT Finished development of AI-based system for detecting intruders (began operating a plant hardened system at Tsurumi Works in FY2023)		[Key measures] (1) Implement 100% of the following key measures to prevent injuries with decisive work plans and proper work instructions in order to eliminate serious injuries • Pre-operation checks (curing openings in high locations and edges of work floor, ensuring on-site understanding of work plans, and covering and enclosing/turning off of machinery) • Strict adherence during operations (use of safety belts, no entry measures/allocation of worksite guides) (2) Multifaceted management of occupational safety and health using IT • Monitor worksites, use information communications systems • Use safety management operations support system
			SH	[Key measures] (1) Installation of safety fences, covers, etc. (100% of plan) (2) 100% implementation of crane operation drills (once a year or more at each company)	[Key measures] (1) Installation of safety fences and covers: Completed 100% of plan (2) Implementation of crane operation drills: Once a year or more at each company; Implemented 100% of drills		[Key measures] (1) 100% implementation of crane operation drills (once a year or more at each company) (2) Review of past incidents at the Company Finish formulating and executing measures for alternative proposals to address past incidents identified as requiring review
		Ensure the health of employees and their families	Groupwide	1. Provision rates of healthcare guidance Groupwide 60% (2023 target)	1. Provision rates of healthcare guidance ST 72.2% EN 39.4% SH 52.1% *FY2021 results	×	1. Provision rates of healthcare guidance Groupwide 60% (2023 target)
				2. Reduce rates of smokers (ensure employee health and prevent exposure to passive smoke) Groupwide 1.5% reduction per year (total for operating companies)	2. Reduce rates of smokers (ensure employee health and prevent exposure to passive smoke) Groupwide 0.7% reduction per year (total for operating companies)	×	2. Reduce rates of smokers (ensure employee health and prevent exposure to passive smoke) Groupwide 1.5% reduction per year (total for operating companies)
	Recruit and nurture diverse human resources	Pursue diversity and inclusion	Groupwide	1. Rates for female recruits ST Career-track (white-collar position): Degree of gender parity Career-track (technical position): 10% or more On-site position: 10% or more EN Career-track (white-collar position): Degree of gender parity Career-track (technical position): 15% or more Production/construction position: 10% or more (four-year average) SH Career-track position: Degree of gender parity	1. Rates for female recruits ST Career-track (white-collar position): 24% Career-track (technical position): 6% On-site position: 6% EN Career-track (white-collar position): 47% Career-track (technical position): 18% Production/construction position: 4% (four-year average) SH Career-track position: 42%	×	1. Rates for female recruits ST Career-track (white-collar position): Degree of gender parity Career-track (technical position): 10% or more On-site position: 10% or more EN Career-track (white-collar position): Degree of gender parity Technical (Career-track, Production/construction position): 15% or more SH White-collar position: Degree of gender parity
				2. Women in managerial positions 10% or more in the position qualified as section manager or above. Of whom, 20% or more to be in management and sales departments (FY2030 target)	2. Women in managerial positions 3.3% in the position qualified as section manager or above. Of whom, 6.1% in management and sales departments (total for operating companies)	△	2. Women in managerial positions 10% or more in the position qualified as section manager or above. Of whom, 20% or more to be in management and sales departments (FY2030 target)
				3. Rate of male employees taking childcare leave or time off related to child rearing Aim for all male employees whose spouses have given birth to take such leave or time off	3. Rate of male employees taking childcare leave or time off related to child rearing 93% (total for operating companies)	△	3. Rate of male employees taking childcare leave or time off related to child rearing Aim for all male employees whose spouses have given birth to take such leave or time off
		Strengthen human resources development	Groupwide	• Training hours per person ST 40 hours or more per year EN 20 hours or more per year SH 20 hours or more per year	• Training hours per person ST 45.2 hours per year EN 20.9 hours per year SH 20.1 hours per year	○	• Training hours per person ST 40 hours or more per year EN 20 hours or more per year SH 20 hours or more per year • Train DX personnel ST Number of internal data scientist trainees: Total of 600 as of the end of FY2023 EN Number of employees who took internal data scientist training: Total of 170 as of the end of FY2023

Areas of Focus		Material Issues	Operating Company	FY2022 KPIs	Initiatives and Results for FY2022	Assessment	FY2023 KPIs
Activity	Recruit and nurture diverse human resources	Create workplaces that motivate employees	Groupwide	Groupwide Annual leave acquisition rate of 75% or more (total for operating companies)	1. Groupwide Annual leave acquisition rate: 82% (total for operating companies)	○	1. Groupwide Annual leave acquisition rate of 75% or more (total for operating companies)
				• Engagement survey Groupwide Affirmative response to questions about motivation: 75% or more Note: Set as a Groupwide target from FY2022	Affirmative response to questions about motivation ST 72% EN 79% SH 78%	△	2. Engagement survey Groupwide Affirmative response to questions about motivation: At least 75%
	Reinforce resilience of production and engineering capabilities (realize worldclass earnings power through DX and other measures)	Increase efficiency and enhance cost competitiveness in production and engineering	ST	1. Improve labor productivity Toward improving labor productivity by 20% by the end of FY2024 • Steadily implement FY2022 milestones for improving labor productivity and enhance the accuracy of plans for FY2023 and FY2024 • Approve and implement FY2022 investments for improving labor productivity, such as automation and remote operation • Steadily consolidate the steel sheet manufacturing line for cans in Chiba	• Set milestones and number of personnel for each fiscal year • Implementing measures to improve labor productivity by 20% (48% progress toward 50% target with linear interpolation)	△	1. Improvement in labor productivity Toward improving labor productivity by 20% by the end of FY2024 • Steadily implement FY2024 milestones each fiscal year for improving labor productivity by 20% • Approve and implement FY2023 investments for improving labor productivity, such as automation and remote operation • Steadily relocate facilities in accordance with structural reforms in Keihin
					• Approved 4.8 billion yen for 38 projects as planned for investments to improve labor productivity through automation and remote operations in FY2022	○	
					• Relocated facilities as planned in line with stoppage of can steel sheet manufacturing line at Chiba in September 2022	○	
				2. Improve yields with DS* activities Achieve stable quality and enhance yields through measures including introduction of quality prediction technology based on integrated data encompassing the entire process from steelmaking to final processing using DS Improve yields by 1.0% in FY2022 from FY2020 levels to achieve 2.0% by FY2024 (based on figures after adjustments to the sales mix) * Data science	Improve yields with DS activities FY2022 yield: 86.5% (up 0.4 point from FY2020)	×	2. Improve yields through DS activities Stabilize production with DS, improve yields through application of quality prediction Improve yields by 1.5% in FY2023 from FY2020 levels to achieve 2.0% by FY2024 (based on figures after adjustments to the sales mix)
			EN	• Increase the efficiency of engineering operations by introducing DX technologies Engineers for big data analysis utilizing Pla'cello*: 1,800 * Pla'cello: Proprietary data analysis platform using AI	• About 1,950 employees (FY2021: About 1,500 employees)	○	• Increase the efficiency of engineering operations by introducing DX technologies Engineers for big data analysis utilizing Pla'cello*: 2,200 * Pla'cello: Proprietary data analysis platform using AI
		Raise quality of products and services and ensure reliable supply	ST	1. Ensure quality • Continue implementing activities for raising awareness of quality compliance for the Company and Group companies in accordance with the Japan Iron and Steel Federation's guidelines for strengthening the quality assurance system • Establish automated technology for testing and inspections (impact test fracture rate, hole expansion, etc.) other than the four priority items (tensile test, molten steel analysis, thickness measurement for hot and cold rolled steel sheets, and coating weight measurement) to improve the level of quality assurance and product testing	• Took steps as planned to improve awareness of quality and compliance among JFE and Group company employees • Finished automation of four priority items in FY2021 In testing and inspections of areas other than four priority items, successfully measured impact test fracture rate in FY2022	○	1. Ensure quality • Continue implementing activities for raising awareness of quality compliance for the Company and Group companies in accordance with the Japan Iron and Steel Federation's guidelines for strengthening the quality assurance system • Promote automated transmission of tensile test results at Group companies Targeting six companies: 67% introduction ratio in FY2023 (100% in FY2025)
				2. Strengthen the manufacturing infrastructures using DX Achieve CPS* installation rate of 36% or more on a companywide basis in FY2022 to implement CPS in all production processes by the end of FY2024. * CPS: Cyber-Physical System	• Companywide CPS installation rate: 35%	△	2. Strengthen the manufacturing infrastructures using DX Achieve CPS installation rate of 60% or more on a companywide basis in FY2023 to implement CPS in all production processes
			EN	1. Secure a stable number of certificated managing engineers	1. Reliably secured certificated managing engineers amid high level of sales	○	1. Secure a stable number of certificated managing engineers
				2. No major quality problems	2. Major quality problems: One incident	×	2. No major quality problems
			SH	1. Make consistent investment in processing and distribution operations	1. Made necessary investments during the fiscal year to ensure reliable supply of products [Investment amount (approved amount)] •Reinforcement: 11.3 billion yen •Renewal and safety: 3.1 billion yen •Systems: 1.6 billion yen Total: 16.0 billion yen	○	1. Make consistent investment in processing and distribution operations
				2. Conduct quality audits at Group companies Continue conducting quality audits at 36 Group manufacturing affiliate companies in Japan (expand the scope from the FY2021 level) and overseas (audit completed: 100%)	Conducted 36 quality audits (100% audit completion rate) • 18 domestic Group companies (zero remote audits) • 18 overseas Group companies (five remote audits)	○	2. Conduct quality audits at Group companies Continue conducting quality audits at 36 Group manufacturing affiliate companies in Japan (same as the FY2022 level) and overseas (audit completed: 100%)

Areas of Focus		Material Issues	Operating Company	FY2022 KPIs	Initiatives and Results for FY2022	Assessment	FY2023 KPIs
Activity	Strengthen competitiveness of products and services (promote the growth strategy by providing high-value-added solutions)	Expand business by increasing value added in products and services with advanced technologies	S T	1. Pursue strategic research and development focusing on priority development fields* Develop new products and technologies FY2022: 20 or more cases (80 or more cases in total from FY2021 to FY2024) * Automobiles, energy, infrastructure construction materials, DX technology, and green transformation (GX) technology	FY2022: 22 cases (10 new products, 12 new technologies) (Total for FY2021 to FY2024: 43 cases)	○	Pursue strategic research and development focusing on priority development fields* Develop new products and technologies FY2023: 20 or more cases (80 or more cases in total from FY2021 to FY2024) * Automobiles, energy, infrastructure construction materials, DX technology, and GX technology
				2. Increase sales ratio of high-value-added products* to 50% by FY2024 (Sell 10.9 million tons of these products, or 50% of total sales volume, excluding semi-finished products, in FY2024) Sales of high-value-added products: 10.3 million tons (sales ratio of 47%) (up 2.5 million tons from FY2020) * Products that offer technological advantages and are recognized by customers for their added value while having greater earnings power than commodity products.	Sales ratio for high-value-added products in FY2022: 47%	○	High-value-added product sales volume ratio in FY2023: 48%
				3. As a step toward triple earnings in the solution business by FY2024 from the FY2020 level • Continuing from FY2021, focus efforts on activities for receiving orders for the new solutions model; In particular, along with concluding a contract for the first project providing DS utilization technologies via the cloud, build a platform that provides services on a subscription basis • In the existing solutions business, expand product offerings and develop new customers while increasing revenue in FY2022 by 50% from FY2020 levels by steadily executing projects	• Created a platform for offering subscription-based services for using DS technologies, connected with customers online in inaugural project • Surpassed target for 50% growth compared with FY2020	○	Aiming to triple solution business revenue by FY2024 compared with FY2020 levels • Develop new products that feature DS technology, facility diagnosis technology and safety technology, launch sales activities to customers • Double revenue in solutions business by FY2023 compared with FY2020 levels
			E N	• Develop technologies in four priority fields of waste to resources, carbon neutrality, combined utility services, and DX, and 65% or more of R&D expenses on these four fields • Number of patent applications: 80 or more per year	• Ratio of R&D spending in four priority fields: 72% • Number of patent applications: 88	○	• Develop technologies in four priority fields of waste to resources, carbon neutrality, combined utility services, and DX, and 70% or more of R&D expenses on these four fields. • Number of patent applications: 80 or more per year
		Sales strategies for realizing sustainable growth	S T	• Expand the earnings difference between high-value-added products (A-rank products) and commodity products to 4,000 yen per tons by FY2024 (revise evaluation method eliminating the impact of market fluctuations and product mix differences) <FY2022 KPI> Aim for 50% of target	• Expanded the earnings difference between high-value-added products (A-rank products) and commodity products to 6,000 yen per ton in FY2022 (achieving 150% of FY2024 target)	○	• Expand the earnings difference between high-value-added products (A-rank products) and commodity products to 6,000 yen per ton (Achieve 150% of FY2024 target)
			E N	Expand the stable earnings base Expand the operating businesses • Sales: 255 billion yen • Expand bases: 3 or more bases Recycling business (food, plastics, electronic appliances, etc.), regional electricity retail new power business, waste processing business, and water and sewage operations business	• Sales of operating businesses: 272.5 billion yen • New bases: 3 bases 1 regional electricity retail new power business base, 1 waste recycling base, 1 wastewater processing base	○	Expand the stable earnings base Expand the operating businesses • Sales: 260 billion yen • Expand bases: 3 or more bases Recycling business (food, plastics, electronic appliances, etc.), regional electricity retail new power business, and waste processing business
			S H	• Increase competitiveness of products and services by improving value added in supply chain management through business expansion Make investments to improve value added in supply chain: 5 or more per year	• Investments to improve value added in supply chain: 5 per year	○	• Increase competitiveness of products and services by improving value added in supply chain management through business expansion Make investments to improve value added in supply chain: 5 or more per year
Basis of Activity	Thoroughly enforce compliance	Ensure adherence to corporate ethical standards and compliance	Groupwide	1. Steady execution of training to foster and maintain a sense of compliance (100% attendance from the target audience)	1. 100% attendance (rank-based compliance training, training on different laws and regulations, etc.)	○	1. Steady execution of training to foster and maintain a sense of compliance (100% attendance from the target audience)
				2. Improve employee awareness of ethics reflected in the Corporate Ethics Awareness Survey (100% attendance from the target audience)	2. Conducted Corporate Ethics Awareness Survey of all employees, survey results verified improvement in employee awareness Questions / FY2019 / FY2022 Has your own awareness increased of the Company's improved compliance systems and initiatives? 70.0% 73.4% Are you aware of the consultation service and how to use it? 77.3% 86.3% Do you agree with and implement the Company's policies regarding power harassment? 70.7% 76.2% Do you manage your work hours in accordance with Company policy? 88.0% 90.3%	○	2. Improve employee awareness of ethics reflected in the Corporate Ethics Awareness Survey
	Respect human rights	Respect human rights across the supply chain		1. 100% attendance from the target audience for human rights awareness training	1. 100% participation rate	○	1. 100% attendance from the target audience for human rights awareness training
				2. Implement human rights due diligence	2. Implemented the following initiatives: • Revised the JFE Group Human Rights Basic Stance • Expanded human rights due diligence to Group companies • Inspected and made necessary changes to procurement guidelines of each operating company	○	2. Implement human rights due diligence

System for Promoting Sustainability

JFE Group Sustainability System

Based on its corporate philosophy of "contributing to society with the world's most innovative technology," the JFE Group will continue to be a company that provides products and services for a prosperous global future for a long time to come.

We also consider it our mission to establish our position as a company essential to society's sustainable development and to create safe, comfortable lives for people everywhere, and become an organization that is highly regarded by society. To realize this mission, we will ensure environmental and social sustainability and establish economic sustainability (stable earnings power). By doing so, we will secure a resilient management foundation for achieving sustainable growth for the Group over the medium to long term and enhance corporate value.

Supervision over Sustainability Initiatives

The Group established the JFE Group CSR Council (JFE Group Sustainability Council as of April 2023), chaired by the president of JFE Holdings and comprised of the executive vice president (director), corporate officers, full-time Audit & Supervisory Board members, the presidents of operating companies, and other members to oversee and direct the sustainability initiatives of the entire organization, including risk management, from the perspective of preventing damage to the JFE Group's corporate value and enhancing it. Independent, cross-Group committees have been established under the council, including the JFE Group Compliance Committee, JFE Group Environmental Committee, JFE Group Internal Control Committee, JFE Group Information Security Committee, Public Disclosure Committee, and Corporate Value Enhancement Committee. Overseeing and directing the Group's sustainability initiatives, these committees deliberate on Group policies, monitor how they are being instilled across the Group, and share information on the tasks at hand as well as on issues that have materialized and relevant responses. Included in the agenda discussed by the JFE Group Sustainability Council, the Group's basic policies, action plans, content of key initiatives and response to critical circumstances are reported regularly to the Board of Directors, which deliberates on the issues and provides the council with direction and supervision.

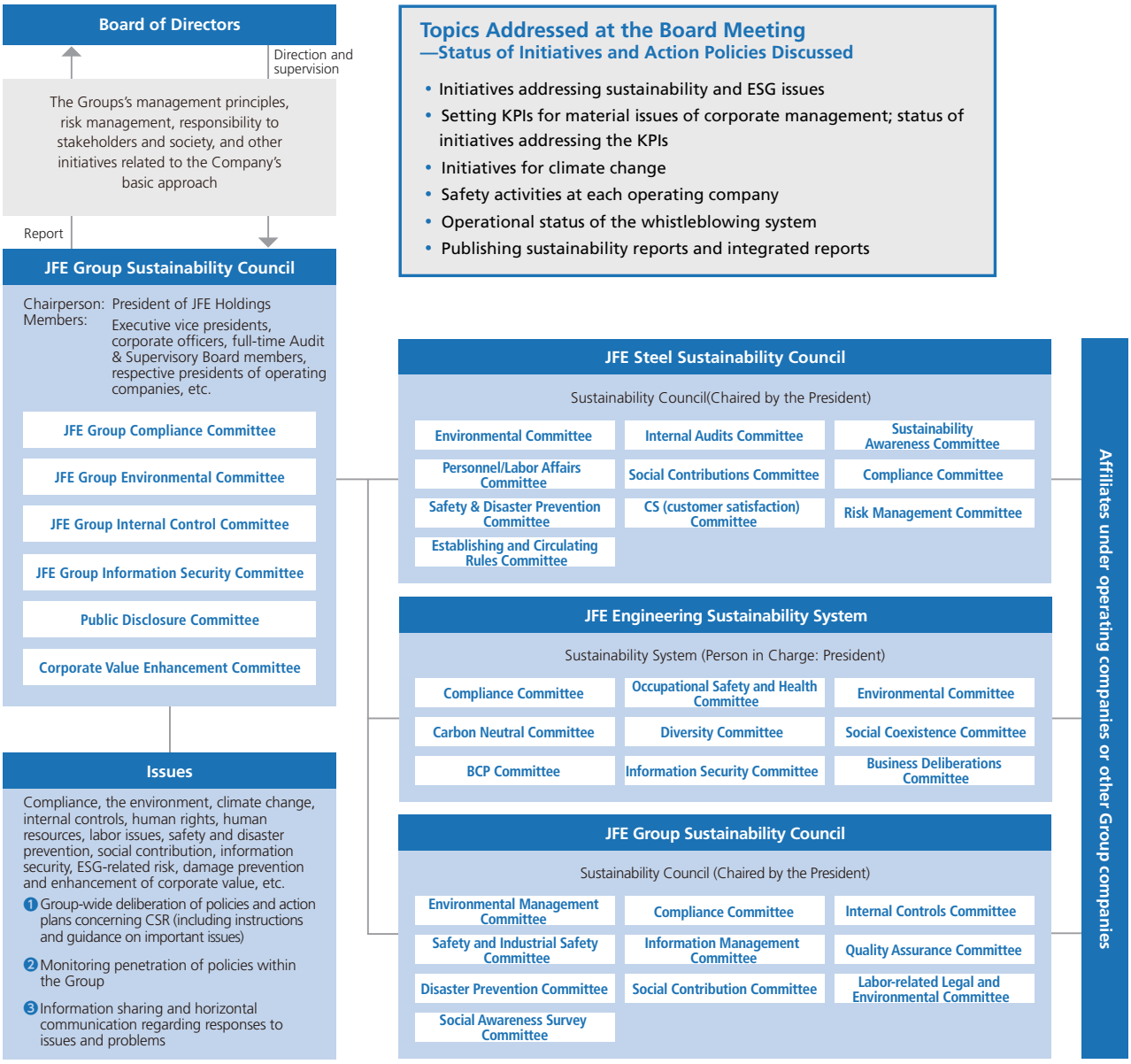
Activities of the Group Sustainability Council

The Group Sustainability Council meets approximately once every three months to discuss wide-ranging issues such as the antimonopoly act, compliance with laws and regulations to prevent corruption such as bribery involving public servants and other officials, human resources, labor issues, safety, disaster prevention, the environment, climate change, quality, financial reports, addressing antisocial forces, risk management including information security and other ESG-related risks, and social contribution. The council deliberates on policies related to Group initiatives, which also include providing instruction and guidance on material issues, monitors the penetration of the policies, and shares information on and carries out horizontal communication regarding our responses to issues and problems.

Cooperation with Operating Companies

The operating companies have also set up respective entities that operate in collaboration with the JFE Group Sustainability Council to promote Group-wide initiatives from the perspective of preventing damage to the JFE Group's corporate value and enhancing that value. JFE Steel established the CSR Council (Sustainability Council as of April 2023) chaired by the president in July 2005, following the establishment of the CSR Section in April 2005. Specific committees and sub-committees in areas such as compliance, global environment, risk management, safety and disaster prevention, customer satisfaction, social contributions, etc., established under the Sustainability Council have been actively conducting the activities in each area, while promoting awareness of sustainability, together with the Group companies. JFE Engineering and JFE Shoji are also working to achieve sustainability through the establishment of committees in areas such as compliance and the environment.

■ Diagram of System for Promoting Sustainability



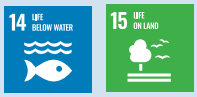
Confirmation and Improvement through the Employee Awareness Survey

The JFE Group conducts a Corporate Ethics Awareness Survey on a regular basis (currently once every three years, twice a year from FY2024) for directors and employees of JFE Holdings and its operating companies to confirm the penetration and thorough compliance of the Group's Corporate Vision, Corporate Values, and Standards of Business Conduct, along with the identification of potential risks. The survey conducted in FY2022 confirmed that many employees acknowledged the vision and corporate policy and are aware of compliance matters when carrying out their work. On the other hand, the survey also brought to our attention issues to address going forward. These are reflected in the specific initiatives of each Group company under the supervision of the JFE Group Sustainability Council and Board of Directors.

Initiatives and Relevant SDGs

The JFE Group is taking action to address material issues of corporate management (materiality), even in non-material areas.

The following chart summarizes all activities introduced in this report. Through these activities, the JFE Group intends to contribute to the achievement of the SDGs.

Activities		Related SDGs
Sustainability Management		
Supply Chain Management (P.44)	• Promoting Green Procurement • Procurement Policy and Initiatives for Each Business	
Addressing ESG Issues		
Environmental Management (P.47)	• Promotion of Environmental Management System • Environmental Education	
Climate Change (P.53)	• Reduction of CO_2 in the Steel Business • Greater Contribution to Reducing CO_2 in Society as a Whole • Scenario Analysis Based on TCFD Recommendations	
Development and Provision of Eco-friendly Processes and Products (P.108)	• Major Eco-friendly Products and Technologies in Each Business	
Efficient Use of Resources (P.131)	• Reducing Generation and Emission of Co-products and Re-using Co-products • Promoting Recycling • Resource Recycling Solution	
Water Security (P.136)	• Addressing Water-related Risks • Efficient Use of Water	
Prevention of Pollution (P.139)	• Controlling Air Emissions • Preventing Water Pollution • Management of Chemical Substances and Reduction of Emissions	
Biodiversity (P.144)	• Biodiversity Initiatives • Commitments to External Initiatives • Products and Technologies to Preserve Biodiversity	
Environmental Communication (P.152)	• Disclosing Environmental Data for Business Sites • Disclosure and Exchange of Information	

Activities		Related SDGs
Responsibility to Customers (Provide Quality Products and Enhance Customer Satisfaction) (P.156)	• Quality Initiatives • Improving Customer Satisfaction • Ensuring Stable Supply	
Human Capital: Occupational Health and Safety (P.165)	• Occupational Health and Safety • Employee Health	
Human Capital: Recruit and Nurture Diverse Human Resources (P.174)	• Workstyle Reform • Operational Reform • Workforce Diversity Promotion • Human Resource Development • Developing Dynamic Work Environments	
Human Rights (P.183)	• Respecting Human Rights Initiatives • Conducting Human Rights Due Diligence	
Community (P.192)	• Local activities • Support for External Organizations • Support for Youth Development • JFE 21st Century Foundation	
Shareholders and Investors (P.201)	• Proactive Information Disclosure	
Compliance (P.216)	• Adherence to Ethical Standard, Legal Compliance	
Tax Transparency (P.224)	• Tax Transparency	

Stakeholder Engagement

The JFE Group strives to maintain agreeable and favorable relationships with all stakeholders, including Stakeholder Engagement shareholders, customers, clients, employees, and local communities, for the sustainable growth and medium- to long-term increase of corporate value.

■ Engagement with JFE's Major Stakeholders

Stakeholder	Major Communication Methods, etc.	Others	
		Frequency (per year)	Scale, etc.
Shareholders and Investors			
We work to disclose information accurately, fairly and in a timely and appropriate manner as well as strive for active communication. We established the Investor Relations and Corporate Communications Department as an organization responsible for communication with domestic and international shareholders and investors, and to promote constructive dialogue as well as provide management with the information acquired, with the aim of maintaining and improving the relationship of trust.	Ordinary general meeting of shareholders	1	Approx. 220,000 shareholders
	Individual meetings, primarily with institutional investors and securities analysts	In Japan: 51 companies (162 meetings) Overseas: 65 companies (130 meetings)	
	Meetings with shareholders, primarily ESG managers or those with voting rights at institutional investors	In Japan: 23 companies (48 meetings) Overseas: 17 companies (17 meetings)	
	Investor meetings and ESG Briefings for analysts and persons responsible for ESG	5	Approx. 1,100 persons in total
	Web-based briefings for individual investors	1,000 real-time participants Over 10,000 views	
	Business site and plant tours for individual shareholders	11	Approx. 1,500 persons
	Newsletters (JFE Dayori)	2(mid-year and annual)	Approx. 280,000 copies per issue
	Various reports, including integrated reports and sustainability reports*1	1	Approx. 23,000 copies
	Information via websites, etc., for shareholders and investors	As needed	
Customers			
The Group believes that the stable supply of products and services and reliable quality assurance, along with advancing research and development, are necessary to meet customer needs. We will work to establish win-win relationships by continuously meeting customer needs and the trust they place in us.	Communication through sales activities and sales support for quality assurance	As needed	Conducted at each operating company
	Interviews and questionnaires, such as those related to customer satisfaction	As needed	Conducted at each operating company
	Information via websites (product information), etc.	As needed	
Suppliers			
As a key business partner, we actively promote CSR initiatives in cooperation with suppliers. We have established a basic purchasing (procurement) policy to promote fair and honest procurement activities and build sound relationships with suppliers.	Communication through purchasing activities	As needed	Conducted at each operating company
	Briefings and exchanges of opinion	As needed	Conducted at each operating company
	Information disclosure and other communication through the website	As needed	

*1 Number of issues published is for the integrated report, and the sustainability report is only posted online.

Stakeholder	Major Communication Methods, etc.	Others	
		Frequency (per year)	Scale, etc.
Employees			
Various initiatives are being actively pursued together with our clients as important business partners. We have established Purchasing and Procurement Policies to promote fair and sincere procurement activities and to establish healthy relationships with clients.	Communications through daily operations and in the workplace	As needed	
	Internal newsletters and intranet	As needed	
	Various labor-management committees	2 to 4	Management and labor unions at each operating company
	Corporate Ethics Hotline	As needed	FY2022: 127 cases
	Various training sessions	As needed	Position-specific, compliance, human rights, etc.
	Family days*1 (visits by employee families, lunch at employees' cafeteria), etc.	As needed	Conducted at each operating company
	Corporate Ethics Awareness Survey	Once every 3 years (once every 2 years starting in FY2024)	Conducted at JFE Holdings and operating companies
	Engagement Survey (employee satisfaction survey)*2	1	Conducted at JFE Holdings and operating companies
	Management feedback (360 degree analysis)*3	1	Conducted at JFE Holdings and JFE Steel
Local communities			
To ensure business continuity at manufacturing bases where steelworks are located and elsewhere, constructing a relationship of trust with citizens in local communities and realizing coexistence and prosperity are crucial. We will pursue various activities with the aim of realizing sustainable growth and regional development, including continued initiatives toward ensuring safety and reducing our environmental impact.	Communication through local residents' association, events, etc.	As needed	
	Events at manufacturing bases (festivals, etc.)*4	1 per region	Approx. 56,000 persons per year
	Plant tours*4	As needed	More than 70,000 persons per year
	Cleanup activities (vicinity of manufacturing bases, regional cleaning, etc.)	As needed	
	Sports promotion (baseball or jogging workshops, various sports competitions, etc.)	As needed	
	Others (dispatch of lecturers to elementary schools, craft workshops, workplace experience events, etc.)	As needed	
	Information via websites (environmental info, etc.)	As needed	
	Social contribution through **JFE 21st Century Foundation** (http://www.jfe-21st-cf.or.jp/eng/index.html) (various research support, regional activity support, etc.)	As needed	

*2 Questionnaire targeting all employees for surveying the level of satisfaction and applying results to initiatives and operations.

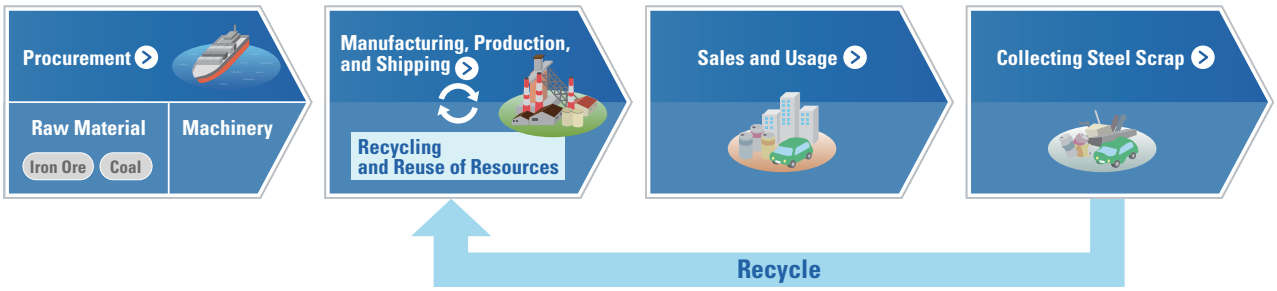
*3 Corporate officers and managers are evaluated by co-workers and subordinates and receive feedback.

*4 Events were held with appropriate measures to prevent the spread of COVID-19. List shows results for FY2022.

JFE Group Value Chain

The JFE Group's value chain encompasses upstream and downstream activities across the globe. We seek to address social challenges by identifying the risks and opportunities that the Group must resolve through its business operations and pursue initiatives that tackle those challenges. We will also continue to strengthen the sustainability of the entire Group and implement countermeasures throughout our value chain.

Overview of the Value Chain



Procurement

To ensure stable supply of iron ore and coal used as raw materials in the production of steel products, we purchase from various sources around the world such as Australia, South America, etc., and transport materials to the steelworks on a special vessel. Equipment and materials used at steelworks plants are also purchased globally.

JFE Steel has established these JFE Steel Procurement Guidelines in accordance with the JFE Group Standards of Conduct and the JFE Group Basic Policy on Human Rights, to enhance sustainability across its entire supply chain. We share these guidelines with our business partners and promote sustainability initiatives throughout our supply chain.

Manufacturing, Production, and Shipping

The JFE Group is one of the world's largest steelmakers and has cutting-edge technologies for the efficient production and stable supply of high-quality steel products, used in products indispensable to daily life such as automobiles, infrastructure, and home appliances. We also promote resource recycling by recycling steel scrap generated in the process of producing steel products while also repurposing iron and steel slag in cement and other construction materials.

Sales and Usage

The JFE Group is committed to developing eco-friendly products such as high tensile strength steel sheets that help reduce the weight of automobiles as well as electrical steel sheets used in electric vehicles. At the same time, we are engaged in a Group-wide effort to accelerate the commercialization of the offshore wind-power generation business. We work at the frontier of production by responding to the diverse needs of different industries through research and development and by improving production technologies.

Collecting Steel Scrap

Steel products at the end of their product life cycle are collected as steel scrap and recycled as materials for the steel production cycle.

Environment

Challenges in the Value Chain	Procurement		Manufacturing, Production, and Shipping	Sales and Usage	Collecting Steel Scrap
	Raw Material Iron Ore/Coal	Machinery			
Climate Change					
JFE Group views the issue of climate change as a critical managerial concern from the perspective of business continuity, and it considers achieving carbon neutrality by 2050 a top priority. By designating climate change issue as a material issue of corporate management, we are actively tackling the challenge to solve this issue.					
Opportunities - Develop ultra-innovative technologies and ensure competitiveness - Increased need for renewable energy solutions - Expand electric arc furnace steelmaking and electric arc furnace engineering businesses - Contribute to reduced CO_2 emissions by providing high-performance steel such as high tensile strength steel sheets and electrical steel sheets			●	●	●
Risks -Heightened decarbonization needs in steelmaking process (blast furnace) -Increase in investment burden for introducing ultra-innovative technologies -Introduction of a carbon tax -Supply chain disruptions caused by severer natural disasters natural disasters -Risk of floods associated with rising sea levels	●	●	●	●	●

Key Initiatives

➤ Climate Change (P.53)

Related Pages

➤ Supply Chain Management (P.44) ➤ Development and Provision of Eco-friendly Processes and Products (P.108)
➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
➤ Steel Industry Initiatives (P.105) ➤ Environmental Data (P.225)

Challenges in the Value Chain	Procurement		Manufacturing, Production, and Shipping	Sales and Usage	Collecting Steel Scrap
	Raw Material Iron Ore/Coal	Machinery			
Development and Provision of Eco-friendly Processes and Products					
Under our corporate philosophy of contributing to society with the world's most innovative technology, the JFE Group strives to reduce its environmental impact by developing steel manufacturing processes and providing technologies and products with due consideration for the environment.					
Opportunities - Develop eco-friendly processes and products and ensure competitiveness			●	●	
Risks - Tighter environmental regulations - Increased environmental impact during product use			●	●	●
Key Initiatives ➤ Development and Provision of Eco-friendly Processes and Products (P.108)					
Efficient Use of Resources					
Given that such issues as resource depletion and environmental pollution are expected to intensify on a global scale, the JFE Group is enhancing resource recycling through recycling co-products generated in the iron and steelmaking process and promoting the international recycling of steel scrap.					
Opportunities - Renewed interest in recyclability of steel - Increased use of scrap - Expand the scrap distribution business			●	●	●
Risks - Shortage of disposal sites for waste generated - Resource depletion - Declining in the grade, rising price and difficulty of obtaining obsolete scrap	●	●	●		●
Key Initiatives ➤ Efficient Use of Resources (P.131) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.108) ➤ Environmental Data (P.225)					

Challenges in the Value Chain	Procurement		Manufacturing, Production, and Shipping	Sales and Usage	Collecting Steel Scrap
	Raw Material Iron Ore/Coal	Machinery			
Water Security					
Steel manufacturing requires large quantities of fresh water for cooling and cleansing products and facilities. For this reason, the efficient use of water resources with due consideration to the source of the water and stakeholders in the area is a key challenge.					
Risks - Increased environmental impact - Tighter environmental regulations - Risk of drought in the water intake area, risk of pollution in the discharge area	●	●	●		
Key Initiatives ➤ Water Security (P.136) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.108) ➤ Environmental Data (P.225)					
Prevention of Pollution					
Controlling air pollutant emissions and aggressively investing in environmental preservation are key for achieving co-existence and mutual prosperity with local communities, the global environment, and society at large as well as ensuring business continuity.					
Risks - Increased environmental impact - Tighter environmental regulations	●	●	●	●	
Key Initiatives ➤ Prevention of Pollution (P.139) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.108) ➤ Environmental Data (P.225)					

Social

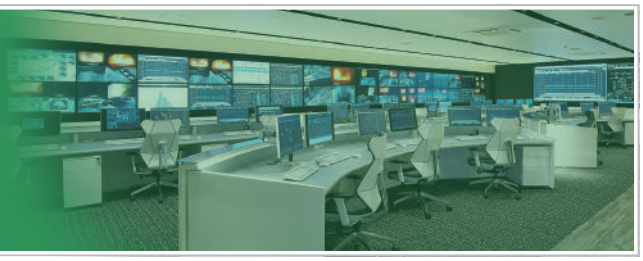
Challenges in the Value Chain	Procurement		Manufacturing, Production, and Shipping	Sales and Usage	Collecting Steel Scrap
	Raw Material Iron Ore/Coal	Machinery			
Responsibility to Customers					
The JFE Group provides steel products used in diverse areas that are indispensable to daily life, such as automobiles, infrastructure, and home appliances. One of our key responsibilities is to serve customers by meeting their quality requirements and providing a stable supply of products.					
Opportunities - Expansion of sustainable procurement and development of a structure for stable procurement - Ensure competitiveness through stable production and stable quality	●	●	●	●	●
Risks - Disruptions to the supply chain associated with climate change-related disasters and natural disasters such as earthquakes - Lose credibility with customers due to issues related to production and quality - Declining in the grade, rising price and difficulty of obtaining obsolete scrap	●	●	●	●	●
Key Initiatives ➤ Responsibility to Customers (Provide Quality Products and Enhance Customer Satisfaction) (P.156) **Related Pages** ➤ Supply Chain Management (P.44) ➤ Social Data (P.243)					
Occupational Health and Safety					
Providing for the health and safety of employees is a basic requirement of companies, particularly manufacturers, and is fundamental to the continued existence of any company. The JFE Group adheres to the philosophy of safety first, and, together with its Group companies and business associates, works to consistently maintain safe working environments and secure workplaces for all employees.					
Risks - Occurrence of accidents, including occupational injuries	●	●	●	●	●
Key Initiatives ➤ Occupational Health and Safety (P.165) **Related Pages** ➤ Supply Chain Management (P.44) ➤ Social Data (P.243)					

Challenges in the Value Chain	Procurement		Manufacturing, Production, and Shipping	Sales and Usage	Collecting Steel Scrap
	Raw Material Iron Ore/Coal	Machinery			
Human Capital: Recruit and Nurture Diverse Human Resources (Labor Standards)					
The JFE Group strives to recruit human resources with different backgrounds and nurture employees who will support its business activities, create workplace environments and systems in which employees feel rewarded in their work and fully demonstrate their abilities, and realize new workstyles that are free from the constraints of time and location. We do this to achieve sustainable corporate growth as well as to comply with laws and regulations.					
Opportunities - Secure excellent human resources through workstyle reform			●		
Risks - Labor shortage - Labor risks - Culture of passing down technical skills is dying out	●	●	●	●	●
Key Initiatives ➤ Recruit and Nurture Diverse Human Resources (Labor Standards)(P.174) **Related Pages** ➤ Social Data (P.243)					
Human Rights					
The JFE Group views respect for human rights as both a corporate social responsibility and a foundation of its business. Our determination to not engage in discrimination in our business activities is clearly expressed in our Standards of Business Conduct, which we have upheld throughout our actions. And we pursue Group-wide initiatives based on the United Nations Guiding Principles on Business and Human Rights.					
Risks - Potential human rights risks	●	●	●	●	●
Key Initiatives ➤ Human Rights (P.183) **Related Pages** ➤ Supply Chain Management (P.44) ➤ Social Data (P.243)					

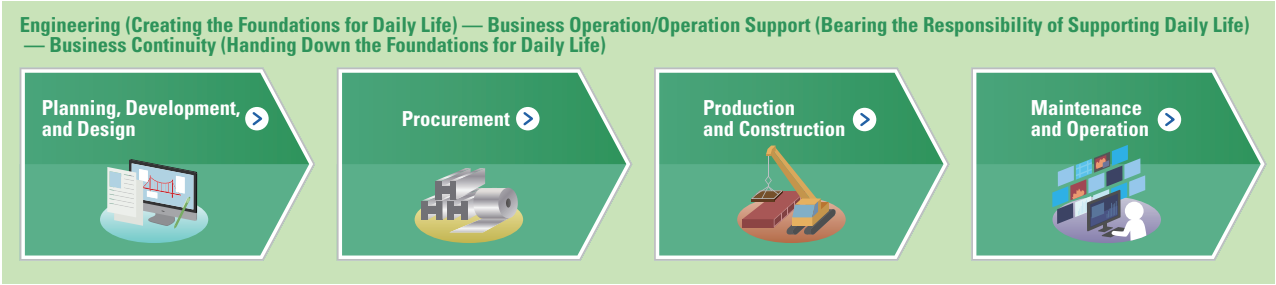
Governance

Challenges in the Value Chain	Procurement		Manufacturing, Production, and Shipping	Sales and Usage	Collecting Steel Scrap
	Raw Material Iron Ore/Coal	Machinery			
Compliance					
In expanding our businesses in and outside of Japan, it is important that JFE maintains relationships of trust with all stakeholders, including its customers, shareholders, and local communities. Trust can only be built upon a strong foundation of ensuring thorough compliance. It is therefore extremely important to conduct training on corruption prevention and other compliance training, so that all members of the organization can deepen their knowledge and awareness of compliance and perform their jobs accordingly.					
Risks - Legal risks such as violations of antitrust law or competition law	●	●		●	
Key Initiatives ➤ Compliance (P.216) **Related Pages** ➤ Supply Chain Management (P.44) ➤ Governance Data (P.249)					
Information Security					
The JFE Group formulates various rules on information security management to prevent information leakage and system failure due to cyber-attack or improper system use and continually raise the level of its information security management.					
- Information leakage and system failure due to cyber-attack or improper system use	●	●	●	●	●
Key Initiatives ➤ Risk Management (P.220) **Related Pages** ➤ Governance Data (P.249) ➤ DX REPORT (https://www.jfe-holdings.co.jp/en/investor/library/dxreport/index.html)					

Engineering Business



Overview of the Value Chain



Engineering (Creating the Foundations for Daily Life)

The JFE Group has built many high-functioning, high-quality facilities in fields such as energy, the environment, and bridges while satisfying the needs of our customers every step of the way, from design to delivery. We have combined and evolved the technologies for processing and assembling in shipbuilding business and technologies relating to materials and combustion in the steel business to create next-generation energy and to address environmental issues. Many of our technologies support society. In addition, we are assembling our resources to develop new business models and new technologies based on existing technologies. We produce high-quality products at low cost by establishing production sites, including one of the largest steel structure production factories in Japan, overseas bases centered on Asian countries, and global engineering structures.

Business Operation/Operation Support (Bearing the Responsibility of Supporting Daily Life)

The JFE Group engages in many private-public initiatives in the field of public services by applying the operational and maintenance know-how acquired over many years, primarily with regard to the environment and water and sewage plants. Furthermore, we build plants, engage in the recycling business and renewable energy business, and take the initiative to realize a recycling-oriented sustainable society. Going forward, we intend to expand our initiatives even further.

Business Continuity (Handing Down the Foundations for Daily Life)

The JFE Group is committed to the construction, operation, and maintenance of infrastructure facilities such as plants related to energy and environment, bridges, and coastal structures to hand down safe and secure foundations for the next generation.

Environment

Challenges in the Value Chain	Planning, Development, and Design	Procurement	Production and Construction	Maintenance and Operations
Climate Change				
The JFE Group strives to reduce CO_2 emissions in society through its eco-friendly products and technologies, including renewable energy technologies and energy-saving products in its engineering business. The Group designates climate change issue as a material issue of corporate management and is tackling the challenge to solve this issue.				
Opportunities - Increased need for renewable energy solutions - Increased demand for CCU*1/CCS*2 facilities - More sophisticated needs in the energy-environment area - Increased response to climate change related disasters (disaster prevention and mitigation, disaster waste processing) - Increased demand for waste to resource technology (food waste power generation)	●	●	●	●
Risks - Supply chain disruptions caused by severer natural disasters - Effects of meteorological disasters - Risk of floods associated with rising sea levels - Tighter environmental regulations	●	●	●	●
Key Initiatives ➤ Climate Change (P.53) **Related Pages** ➤ Supply Chain Management (P.44) ➤ Development and Provision of Eco-friendly Processes and Products (P.108) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91) ➤ Environmental Data (P.225)				
Development and Provision of Eco-friendly Processes and Products				
Under its corporate philosophy of contributing to society with the world's most innovative technology, the JFE Group will contribute to meeting social challenges related to reducing environmental impact through business operations that focus on the environment and recycling fields as growth sectors.				
Opportunities - Need for improving operational efficiency and reducing environmental impact - Need for cost reduction and energy saving	●		●	●
Key Initiatives ➤ Development and Provision of Eco-friendly Processes and Products (P.108)				

*1 Carbon dioxide capture and utilization

*2 Carbon capture and storage

Challenges in the Value Chain	Planning, Development, and Design	Procurement	Production and Construction	Maintenance and Operations
Efficient Use of Resources				
Given that issues such as resource depletion and environmental pollution are expected to intensify on a global scale, our resource recycling solutions include operating our own waste recycling and energy supply businesses, in addition to constructing and providing plants for waste incineration and sludge digestion to customers.				
Opportunities - Increased demand for waste to resource technology (plastics recycling, food waste power generation)	●	●		●
Risks - Shortage of disposal sites for waste generated - Prevention of resource depletion		●	●	●
Key Initiatives ➤ Efficient Use of Resources (P.135) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.108) ➤ Environmental Data (P.225)				
Water Security				
We provide total management of water and sewage systems, including maintenance and operations, to secure vital lifelines and are thereby contributing to reducing the negative impact on the water environment.				
Opportunities - Need for improving operational efficiency and reducing environmental impact				●
Risks - Risk of drought in the water intake area, risk of pollution in the discharge area - Violation of environmental regulations and laws		●	●	●
Key Initiatives ➤ Water Security (P.136) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.108) ➤ Environmental Data (P.225)				

Challenges in the Value Chain	Planning, Development, and Design	Procurement	Production and Construction	Maintenance and Operations
Prevention of Pollution				
Controlling air pollutant emissions and aggressively investing in environmental preservation are key for achieving co-existence and mutual prosperity with local communities, the global environment, and society at large, as well as for ensuring business continuity.				
Opportunities - Need for improving operational efficiency and reducing environmental impact				●
Risks - Increased environmental impact - Violation of environmental regulations and laws - Environmental accidents - Pollution of the environment	●	●	●	●

Key Initiatives

➤ Prevention of Pollution (P.139)

Related Pages

➤ Development and Provision of Eco-friendly Processes and Products (P.108) ➤ Environmental Data (P.225)

Social

Challenges in the Value Chain	Planning, Development, and Design	Procurement	Production and Construction	Maintenance and Operations
Responsibility to Customers				
The JFE Group has developed a global engineering system encompassing one of the largest steel structure production factories in Japan, overseas bases centered on Asian countries, and global engineering structures. We intend to maximize customer satisfaction by complying with the Group-wide quality policy, providing high-quality products and services, and reinforcing our after-sales service system.				
Opportunities - Expansion of sustainable procurement and development of a structure for stable procurement - Implement requested functions - Need for cost reduction and energy saving - Expand the business scale through privatization of public services	●	●	●	●
Risks - Lose credibility with customers due to issues related to production and quality	●			●
Key Initiatives ➤ Responsibility to Customers (Provide Quality Products and Enhance Customer Satisfaction) (P.156) **Related Pages** ➤ Social Data (P.243)				
Human Capital: Occupational Health and Safety				
Providing for the health and safety of employees is a basic requirement of companies, particularly manufacturers, and is fundamental to the continued existence of any company. The JFE Group adheres to the philosophy of safety first, and, together with its Group companies and business associates, works to consistently maintain safe working environments and secure workplaces for all employees.				
Opportunities - Maximize human capital through physical and mental health	●	●	●	●
Risks - Occurrence of accidents, including occupational injuries - Disruptions to the supply chain caused by COVID-19	●	●	●	●
Key Initiatives ➤ Occupational Health and Safety (P.165) **Related Pages** ➤ Supply Chain Management (P.44) ➤ Social Data (P.243)				

Challenges in the Value Chain	Planning, Development, and Design	Procurement	Production and Construction	Maintenance and Operations
Human Capital: Recruit and Nurture Diverse Human Resources (Labor Standards)				
The JFE Group strives to recruit human resources with different backgrounds and nurture employees who will support its business activities, create workplace environments and systems in which employees feel rewarded in their work and fully demonstrate their abilities, and realize new workstyles that are free from the constraints of time and location. We do this to achieve sustainable corporate growth as well as to comply with laws and regulations.				
Opportunities - Saving labor through new technology - Need for remote monitoring and automation due to a lack of human resources			●	●
Risks - Labor shortage - Labor risks - Culture of passing down technical skills is dying out	●	●	●	●
Key Initiatives ➤ Recruit and Nurture Diverse Human Resources (Labor Standards) (P.174) **Related Pages** ➤ Social Data (P.243)				
Human Rights				
The JFE Group views respect for human rights as both a corporate social responsibility and a foundation of its business. Our determination to not engage in discrimination in our business activities is clearly expressed in our Standards of Business Conduct, which we have upheld throughout our actions. And we pursue Group-wide initiatives based on the United Nations Guiding Principles on Business and Human Rights.				
Risks - Potential human rights risks	●	●	●	●
Key Initiatives ➤ Human Rights (P.168) **Related Pages** ➤ Supply Chain Management (P.44) ➤ Social Data (P.243)				

Governance

Challenges in the Value Chain	Planning, Development, and Design	Procurement	Production and Construction	Maintenance and Operations
Compliance				
In expanding our businesses in and outside of Japan, it is important that JFE maintains relationships of trust with all stakeholders, including its customers, shareholders, and local communities. Trust can only be built upon a strong foundation of ensuring thorough compliance. It is therefore extremely important to conduct training on corruption prevention and other compliance training, so that all members of the organization can deepen their knowledge and awareness of compliance and perform their jobs accordingly.				
Risks - Legal risks such as violations of antitrust law or competition law		●		●
Key Initiatives ➤ Compliance (P.216) **Related Pages** ➤ Supply Chain Management (P.44) ➤ Governance Data (P.249)				
Information Security				
The JFE Group formulates various rules on information security management to prevent information leakage and system failure due to cyber-attack or improper system use and continually raise the level of its information security management.				
Risks - Information leakage and system failure due to cyber-attack or improper system use	●	●	●	●
Key Initiatives ➤ Risk Management (P.220) **Related Pages** ➤ Governance Data (P.249) ➤ DX REPORT (https://www.jfe-holdings.co.jp/en/investor/library/dxreport/index.html)				

Supply Chain Management

Basic Policy

Through the adoption of the Sustainable Development Goals (SDGs) and the Paris Agreement, the international community has called on companies to actively engage in actions to resolve global issues toward realizing a sustainable society. Existing harmoniously with the global environment, respecting human rights, and providing challenging work environments are some of the JFE Group's commitments in the JFE Standards of Business Conduct and the Group promotes initiatives under these standards. In order to realize a sustainable society, we believe it is important to address these challenges within the Group itself as well as across the entire supply chain. We will continue to push forward with our initiatives supported by the understanding of our suppliers and other business partners.

Promoting Green Procurement

The JFE Group's procurement policies help to conserve resources and protect the environment by ensuring adherence not only to all laws and regulations but also to procurement principles stated in the Charter of Corporate Behavior developed by the Japan Business Federation. Going forward, the JFE Group expects to accelerate such efforts in its supply chains.

Procurement Policy and Initiatives by Each Business

JFE Steel

JFE Steel Procurement Guidelines and Requests to Suppliers to Promote Sustainability

To guide its procurement of raw materials, JFE Steel established the JFE Steel Procurement Guidelines, in accordance with the JFE Group Standards of Conduct and the JFE Group Basic Policy on Human Rights, to promote activities for realizing sustainability across its entire supply chain. Under the guidelines, JFE Steel pays due consideration to human rights, including the prohibition of child labor and forced labor, as well as legal compliance and environmental protection. In addition, the company purchases raw materials after investigating and confirming that suppliers are not handling conflict minerals.

We share these guidelines with our business partners and promote sustainability initiatives throughout our supply chain.

For the JFE Steel Procurement Guidelines, please refer to the following.

➤ JFE Steel Procurement Guidelines (https://www.jfe-steel.co.jp/en/company/pdf/procurement-guidelines.pdf)

JFE Engineering

Basic Procurement Policy, and Requests to Suppliers to Promote CSR

Viewing its suppliers as key partners in achieving mutual growth, JFE Engineering strives to nurture mutual trust and reinforce partnership relationships.

JFE Engineering established its Basic Procurement Policy to implement fair and transparent procurement activities. Under its Procurement Guidelines, it also makes specific requests to its business partners and asks for their compliance to promote sustainable procurement by working hand in hand to advance corporate social responsibility (CSR) initiatives.

For JFE Engineering's Basic Procurement Policy and Procurement Guidelines, please refer to the following.

➤ **Basic Procurement Policy and Procurement Guidelines** (https://www.jfe-eng.co.jp/en/information/procurement_policy.html)

JFE Shoji

Ensuring a Safe, Fair Supply Chain

The JFE Shoji Group engages in activities toward becoming a company with a strong presence that can achieve sustainable development and growth together with its customers, the JFE Group, and all other stakeholders. JFE Shoji believes that ensuring sustainability across the supply chain is a key issue for achieving this goal and established the Basic Policy on Sustainability in the Supply Chain to guide its efforts on human rights, labor issues, the global environment, and other matters. The JFE Shoji Group seeks the understanding and cooperation of its suppliers and other business partners in complying with the policy and will work with them to establish a more sustainable supply chain.

For JFE Shoji's Basic Policy on Sustainability in the Supply Chain, please refer to the following.

➤ **Basic Policy on Sustainability in the Supply Chain** (https://www.jfe-shoji.co.jp/en/sustainability/promote/)

Environment: Executive Summary

The JFE Group strives to maintain its businesses in harmony with the environment for the prosperity of society. We have positioned climate change as a key management concern and formulated the JFE Group Environmental Vision for 2050 toward achieving carbon neutrality by 2050. To this end, we are exploring ways to reduce CO_2 emissions in steelmaking processes and expand our contribution to reducing CO_2 emissions in society as a whole. The entire Group is working in concert to establish a framework for environmental management and address climate change and other environmental issues such as environmental protection and the effective use of resources.

The JFE Group systematically addresses climate change by reflecting the TCFD's philosophy in its management strategies.

In the steel business, we created a roadmap for achieving carbon neutrality by 2050 and are working on CO_2 emission reduction initiatives toward short-, medium-, and long-term targets. Our overall goals are to reduce CO_2 emissions by 18% by the end of FY2024, compared to FY2013, and by more than 30% in FY2030. Until 2030, we will continue to shift to low-carbon steelmaking processes and at the same time develop ultra-innovative technologies, mainly the carbon-recycling blast furnace, to achieve carbon neutrality by 2050. This year, we started construction work for test furnaces for verifying each technology. In the first half of FY2023, we started supplying the JGreeX™ brand, a variety of green-steel products that will significantly lower CO_2 emissions in the steel manufacturing process, compared to conventional products.

In the engineering business, we plan to contribute 25 million tonnes of CO_2 reduction to society as a whole in FY2030 by provisioning renewable energy power generation facilities. We also intend to further expand our renewable energy power generation by leveraging the Group's collective strength and accelerating the offshore wind power generation business. This year, we started constructing the country's first monopile manufacturing plant toward starting production in April 2024.

We are developing and providing environmentally sound processes and products as part of our contribution to the environment through our businesses, including the reduction of our environmental impact as stated in our environmental policy. In addition, we have set aggressive targets to manage initiatives such as effectively using resources in the mainstay steelmaking processes, preventing air and water pollution, and efficiently using water resources, and we are actively addressing these concerns. Furthermore, we are striving to minimize the impact on the ecosystem surrounding our business sites and analyzing the impact on diversity of using our steel slag products.

Targets and Results for Environment-related Material Issues of Corporate Management

➤ **Material Issues of Corporate Management and KPIs** (P.20)

Key Initiatives

- Promoting the acquisition of Environment Management System certification, conducting internal and external environmental audits
- **Formulation of the JFE Group Environmental Vision for 2050** and roadmap (P.53) for achieving carbon neutrality
- **Started supplying JGreeX™ green steel products** (P.61)
- **Development of ultra-innovative technologies** (P. 62), mainly the carbon-recycling blast furnace
- Group-wide effort to accelerate the commercialization of **the offshore wind-power generation business** (P.77)
- Development and provision of environmentally sound products and processes
- Development of products that take advantage of steel's excellent recyclability, contribution to reducing plastic waste
- **Effective use of water resources** (P.136) in steelmaking processes (high recirculation rate)
- Improvement and assessment of the environment at and around business sites, **contribution to biodiversity** (P.144) from using steel slag products

Environmental Management

Basic Policy

JFE Group companies are developing innovative technologies and international cooperation for the protection of the global environment by operating in harmony with the global environment, as well as protecting it, in accordance with the Group's environmental philosophy and policy.

Environmental Philosophy

The JFE Group puts top priority on protecting and enhancing the global environment to maintain its business in harmony with the environment and ultimately for the prosperity of society as a whole.

Environmental Strategies

1. Reduce the environmental impact of all businesses
2. Contribute through technologies and products
3. Contribute through businesses for resource conservation and energy efficiency
4. Communicate with society
5. Facilitate international cooperation

Management Structure

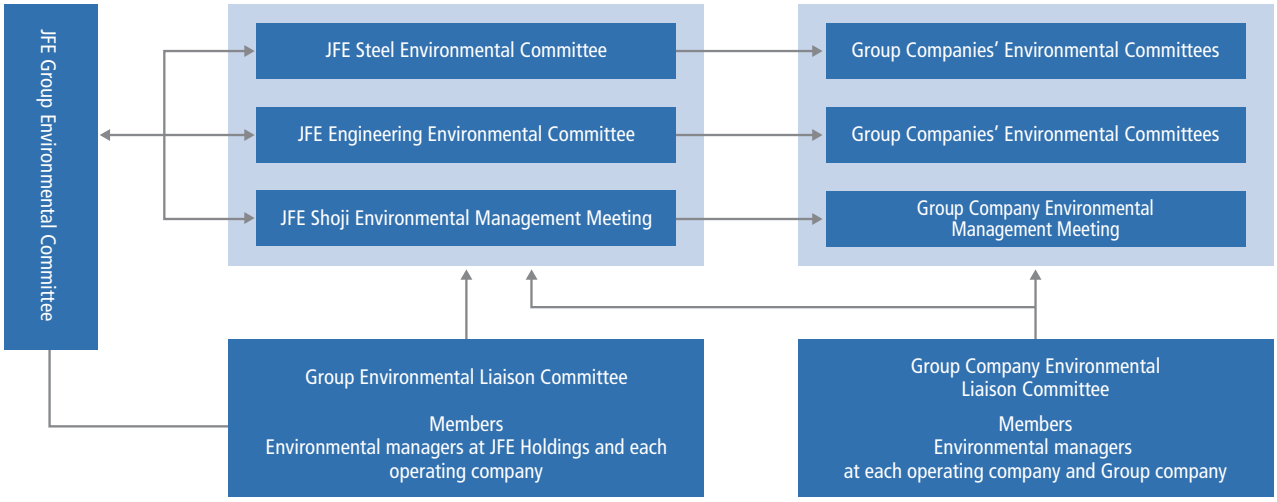
Framework for Environmental Management

The JFE Group Environmental Committee, chaired by the president of JFE Holdings and operating under the JFE Group Sustainability Council, sets goals for environmental protection, monitors the progress of these initiatives and works to improve the Group's overall environmental performance. Key issues for corporate management such as climate change are deliberated at the Group Management Strategy Committee as well and reported to the Board of Directors. The board oversees environmental challenges by discussing the reported material. Additionally, specialized committees set up by JFE Group operating companies and affiliates implement specific activities.

In our Seventh Medium-term Business Plan, we positioned climate change as a top-priority business concern and formulated the JFE Group Environmental Vision for 2050. To this end, we are aggressively pushing forward to achieving our CO_2 reduction targets and achieving carbon neutrality by 2050.

For further details, refer to:
➤ System for Promoting Sustainability (P.24)
➤ Seventh Medium-term Business Plan (P.12)
➤ JFE Group Environmental Vision for 2050 (P.53)

■ **Environmental Management System**



Initiatives

Environmental Management System

Acquiring ISO 14001 certification is a key part of every JFE Group company's environmental program. All global production sites of JFE Steel and JFE Engineering and major offices of JFE Shoji have been certified, encompassing 67% of 43,848 employees at 84 companies covered in this report and 52% of all sites. In FY2022, there were no major violations of environmental laws or regulations by Group companies (air, water, soil, etc.) that resulted in a fine or other penalty.

For quantitative data related to ISO 14001 for each business, please refer to the following information.

➤ **List of ISO 14001-certified companies** (https://www.jfe-holdings.co.jp/en/csr/environment/env_manage/pdf/iso14001.pdf)

JFE Steel

JFE Steel maintains Environment Management Departments at its head office and in each business office, as well as an Environmental Committee, chaired by its president and Environment Management Committees in each local office.

➤ **Environmental Management System** (Environmental Strategies) (Japanese only)(https://www.jfe-steel.co.jp/research/environment.html)

JFE Engineering

JFE Engineering maintains an Environment Management Department at each of its major locations, including production sites and branch offices as well as all divisions in charge of products. The Environmental Committee, chaired by the president, oversees environmental management for the entire company. Under its Environmental Management System, JFE Engineering works to minimize environmental impact at production sites, branch offices and construction sites and contribute to environmental protection through all products and services. The major strategies for FY2023 are (1) promote environmental contribution through products for mitigating global warming and climate change, (2) promote environmental protection, effective energy conservation, and resource recycling in business activities, and (3) ensure thorough compliance with environmental laws and regulations.

JFE Shoji

JFE Shoji obtained ISO 14001 certification for its head office, Osaka branch, and Nagoya branch in 2000 and later expanded the scope of certification to all domestic offices. JFE Shoji also applies the same environmental management system to domestic Group companies, promoting the same environment management activities and striving for the same certification. Overseas coil centers are also planning to acquire ISO 14001 certification.

Environmental Audit

In addition to the regular internal and external audits at ISO 14001-certified sites, the audit and environment departments at each operating company's head office conduct independent environmental audits at their production sites.

JFE Steel

Once a year, JFE Steel's Audit Department and the Environment, Disaster Prevention and Recycling Department conduct an environmental audit at each operational site. JFE Steel categorizes Group companies based on the result of risk assessment considering owned equipment and conducts detailed audits every one to five years using checklists.

Document audit at a domestic Group company on-site audit at a domestic Group company

On-site audit at a domestic Group company

JFE Engineering

JFE Engineering places a top priority on complying with environmental laws and regulations.

The Safety and Environment Department conducts annual audits at about 50 locations selected from the manufacturing sites, construction sites in Japan, and Group companies to confirm compliance with environmental laws and regulations. JFE Engineering also conducts internal audits on its own environmental management system to evaluate and enhance the effectiveness of various environment-related initiatives. Furthermore, environmental inspections are conducted at all construction sites by the department responsible for construction to verify compliance with the laws and regulations, and annual self-checks are conducted at the Tsurumi and Tsu manufacturing sites to confirm legal compliance.

JFE Shoji

At JFE Shoji, the ISO Environmental Audit Department annually confirms that processing centers and warehouses of ISO 14001-certified Group companies comply with relevant environmental laws and regulations. For non-certified Group companies, the department conducts an environmental audit every three years.

For quantitative data related to environmental audits, please refer to the following information.
➤ Environmental Data (P.225)

Environmental Education

The JFE Group actively provides education to foster a corporate culture of environmental protection. Education at operating companies includes training for new recruits and newly promoted employees as well as specific environmental-protection training by position and job.

For Group-wide environmental training, we hold an annual Review Session on Environment-Related Laws and Regulations, to which lawyers specialized in environment-related laws and regulations are invited to give lectures on the latest information related to the enactment and revision of these laws, as well as associated violations and court decisions. Employees from wide-ranging departments, including the environment, disaster prevention, legal affairs, general affairs, and manufacturing departments of the operating companies and their group companies, who are involved in environment-related activities, attend these annual sessions as the basis for planning their activities, such as educating employees and raising awareness about the Group's policies and initiatives.

JFE Steel

JFE Steel encourages employees to obtain qualifications as pollution-control managers. A training program for environmental managers at group companies was launched in FY2011. In addition, JFE Steel provides employees with training to ensure compliance with environmental laws, disseminates information about regulatory revisions at its Environmental Liaison Committee meetings for Group companies, and organizes brush-up training in waste management skills for on-site personnel.

JFE Engineering

JFE Engineering educates all employees about environmental issues to increase their understanding of the company's policies and initiatives. To ensure proper environmental management at production and construction sites, training is often tailored to specific employee operations, helping to enhance their capabilities. In FY2022, JFE Engineering expanded its remote training opportunities and focused on practical application grounded in actual business operations, such as responding to changes in laws and regulations.

JFE Shoji

JFE Shoji provides all employees with general environmental training in compliance with ISO 14001 and specialized training for internal audit staff.

All employees within the scope of certification receive a pocket-size ISO Employee Card to carry with them so they can check the details of ISO 14001 activities at any time. In addition, each company performs a self-check using its own extensive checklist to ensure understanding and rigorous compliance with environmental laws. Also, JFE Shoji provides environmental training to new executives and information about revised laws and regulations to environmental management personnel.

For quantitative data related to environmental education, please refer to the following information.
➤ Environmental Data (P.225)

Environmental Accounting

Basic Policy

The JFE Group is saving energy and reducing its environmental impacts by making its production facilities increasingly efficient and introducing more environmentally friendly equipment. Any equipment or facilities related to energy conservation and environmental protection are categorized as environmental investment, while all activities related to environmental protection and impact reduction are categorized as environmental expenses.

Environmental Investment and Expenses

Environmental capital investment totaled 32.7 billion yen and expenses amounted to 121.5 billion yen in FY2022. Capital investment included 15.9 billion yen to address air pollution, 5.5 billion yen to prevent global warming (addressing climate change), and 4.3 billion yen to prevent water pollution. Environmental capital investment was roughly 76% of overall capital investment.

Environmental expenses for environmental activities included 35.9 billion yen for global warming countermeasures (addressing climate change), 31.2 billion yen to prevent air pollution, and 21.6 billion yen for industrial water recycling. Environmental R&D expenses (air, water, soil, etc.) came to 10.5 billion yen.

Capital Investment

The JFE Group invests in environmental technologies for plants and equipment to save energy and reduce environmental impacts stemming from production. Cumulative investment in energy savings, totaling 570.8 billion yen since 1990, has enabled the company to achieve energy efficiencies that are among the highest in the world. In total, the Group has invested 797.1 billion yen in environmental protection since 1973.

Results of Environmental Activities

Through these environmental investments and expenses, we are working to lower unit-based CO_2 emission to prevent global warming and to reduce final-disposal waste by maintaining a high recycling rate to effectively use natural resources. We are also striving to reduce emissions of pollutants into the water and air, which contributes to environmental protection and ensures thorough compliance with statutory regulations concerning exhaust gas emissions and discharged water.

The monetary value of energy savings realized through environmental capital investments and expenses in FY2023 is about 2.2 billion yen.

■ Breakdown of Environmental Costs

Main Items		FY2022	
		Investment (billion yen)	Cost (billion yen)
Management	Impact monitoring and measurement, and EMS expenses and education	1.4	2.7
Global warming countermeasures	Saving and efficiently using energy	5.5	35.9
Conservation of natural resources	Recycling industrial water	3.2	21.6
	Recycling and waste management of internally generated materials, etc.	1.4	6.2
Environmental protection	Air pollution countermeasures	15.9	31.2
	Water pollution countermeasures	4.3	10.7
	Prevention of soil contamination, noise, vibration, and land subsidence	0.0	0.5
Other	Charges, etc.	—	1.4
R&D	Technologies for protecting the environment, saving energy, and preventing global warming, air pollution, and water pollution	1.0	10.5
Societal activities	Support for nature preservation and forestation, information disclosure, exhibitions, and public relations	—	0.7
Total		32.7	121.5

Note: Data cover all investment activities of JFE Steel Corporation and R&D activities of JFE Engineering Corporation.

For quantitative data related to environmental accounting, please refer to the following information.
➤ Environmental Data (P.225)

Related Links

➤ Material Flow (P.225)
➤ JFE Steel: Environmental Initiatives (Japanese only) (https://www.jfe-steel.co.jp/research/environment.html)
➤ JFE Engineering: 360° JFE Engineering—Protecting Natural Environments (https://www.jfe-eng.co.jp/en/360_jfe_engineering/#env)
➤ JFE Shoji: Environment Management (https://www.jfe-shoji.co.jp/en/csr/environment/)

Climate Change

Basic Policy

Climate change is a critical business concern for the JFE Group from the perspective of business continuity. Our steel business, which emits 99.9% of the Group's total CO_2 emissions, has been developing various technologies for saving energy and reducing these emissions. We have applied these technologies to steel manufacturing processes to enable production with low levels of CO_2 emission intensity.

Furthermore, we have developed and maintained a variety of eco-friendly products and technologies, including high-performance steel materials that help save energy when customers use them, as well as renewable energy power generation.

We will continue to develop and promote the widespread use of these processes and products. We consider this as an opportunity to apply the technologies we have fostered across the globe and at the same time contribute to tackling climate change.

JFE announced **its endorsement for the TCFD recommendations in May 2019** and has identified climate change-related issues based on the scenario analysis advocated in the TCFD to formulate strategies for sustainable growth. In September 2020, JFE disclosed its target of reducing CO_2 emissions in FY2030 in the steel business, which accounts for most of the Group's CO_2 emissions. It also announced **its intention to achieve carbon neutrality by 2050**, ahead of the Japanese government's announcement of the same goal.

In February 2022, **the target of reducing CO_2 emissions in FY2030 was revised upward to 30% or more, compared to FY2013,** considering advances in measures for carbon neutrality and improvement of external surroundings in the steel sector.

JFE Group Environmental Vision for 2050

The JFE Group intends to strengthen sustainability through solutions that address global climate change issues while restructuring its business in response to changes in the environment surrounding the steel business. We regard 2020 as a milestone year for further reinforcing our efforts to tackle climate change, and we are actively promoting initiatives for reducing CO_2 emissions.

In 2021, we positioned climate change as a top-priority issue in the Seventh Medium-term Business Plan and **formulated the JFE Group Environmental Vision for 2050 toward achieving carbon neutrality by that year.**

We will systematically address climate change by **reflecting the TCFD's principles in the business strategies** of our JFE Group Environmental Vision for 2050. In the steel business, we **will reduce CO_2 emissions by 18% from FY2013 levels by the end of FY2024.** In addition, we announced that **the target of reducing CO_2 emissions in FY2030 is 30% or more, compared to FY2013, in the steel business.** To explore all possibilities for realizing carbon neutrality in 2050, we will take on the challenge of developing ultra-innovative technologies such as **carbon-recycling blast furnaces developed with our proprietary technology** while also adopting a multitrack approach for pursuing other technologies. In our engineering business, we will widen our contribution to the reduction of CO_2 in society as a whole by expanding and advancing renewable power generation and carbon-recycling technologies, supplying high-performance steel products, and other initiatives. Furthermore, we will apply Group strengths to accelerate the commercialization of **our offshore wind-power business.**

JFE Group Environmental Vision for 2050

- **Climate change is a critical business concern for JFE, and we are aiming to achieve carbon neutrality by 2050.**
- **We will accelerate our research and development of new technologies and pursue ultra-innovative technologies.**
- **We will seek business opportunities that allow us to enhance corporate value by contributing to CO_2 emissions reduction across society.**
- **The principles of TCFD will be reflected in our business strategies and systematically deployed.**

The Target of Reducing CO_2 Emissions in FY2024 (Seventh Medium-term Business Plan Initiatives)

▶Reduce steel-business CO_2 emissions in FY2024 by 18%, compared to FY2013 (steel business)

The Target of Reducing CO_2 Emissions in FY2030

▶Reduce steel-business CO_2 emissions in FY2030 by 30% or more, compared to FY2013 (steel business)

Initiatives for Carbon Neutrality by 2050

(1) Reduce steel-business CO_2 emissions

- ▶ Pursue ultra-innovative technology for carbon-recycling blast furnaces and CCU.
- ▶ Develop hydrogen-based ironmaking (direct reduction) technology.
- ▶ Leverage top-in-class electric arc furnace technology for high-quality, high-performance steel manufacturing, high efficiency, etc.
- ▶ Develop transitional technologies for carbon neutrality, including ferro coke, increased use of steel scrap in converters, energy savings, and low-carbon energy transformations.

(2) Expand contributions to CO_2 emissions reduction in society

- ▶ JFE Engineering: Expand and develop renewable energy power generation and carbon-recycling technologies. (Reduce CO_2 emissions by 12 million tonnes in FY2024 and 25 million tonnes in FY2030)
- ▶ JFE Steel: Develop and market eco-products and eco-solutions.
- ▶ JFE Shoji: Increase trading in biomass fuels, steel scrap, etc., and strengthen business in supply chain management (SCM) for eco-products.

(3) Offshore wind-power generation business (Group-wide effort to accelerate commercialization of the offshore wind-power business)

- ▶ JFE Engineering: Manufacture monopiles and other seabed-fixed structures for offshore wind-power generation.
- ▶ JFE Steel: Produce large and heavy plates by using new continuous casting machine in Kurashiki.
- ▶ JFE Shoji: Carry out SCM for steel materials and processed products.
- ▶ Japan Marine United Corporation: Manufacture offshore wind-power generation floating structures and construct work vessels.
- ▶ Group-wide: Operation and maintenance (O&M) making maximum use of Group resources.

Notes.

- Carbon-recycling blast furnace: A technology that converts CO_2 from the blast furnace into methane, which is then used as reducing material in the blast furnace
- CCU: Carbon dioxide capture and utilization
- Transitional technologies: Technologies that advance the transition to carbon neutrality
- Ferro coke: Innovative blast furnace raw material that improves the reduction efficiency of iron ore and reduces CO_2 generation from the blast furnace

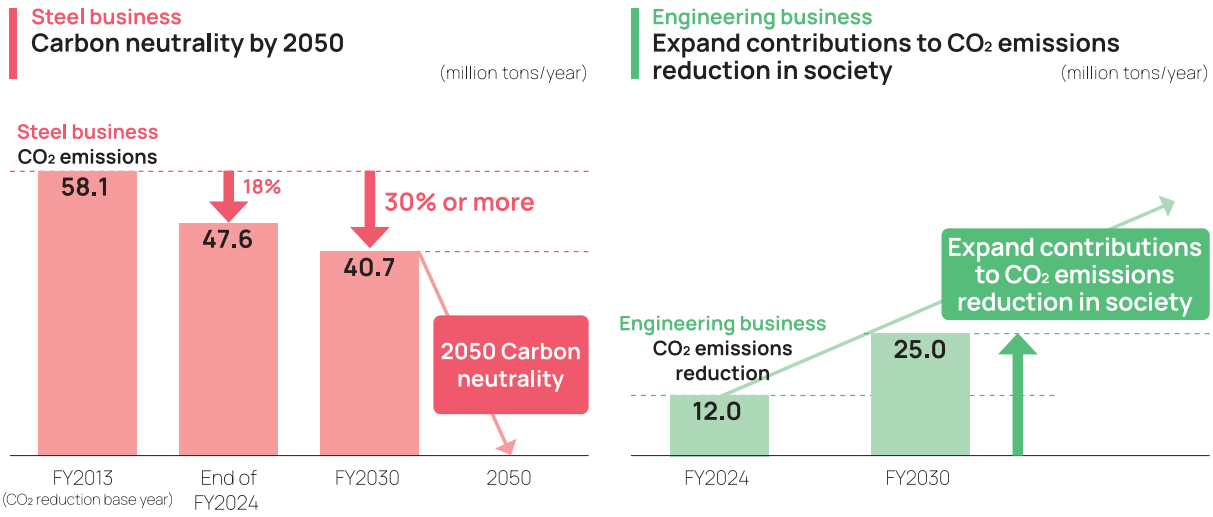
➤ Seventh Medium-term Business Plan (P.12)

➤ JFE Group Environmental Vision for 2050, Presentation Material
(https://www.jfe-holdings.co.jp/en/investor/zaimu/g-data/2020/May2021-210525-release01.pdf)

Developing processes to mass produce high-quality, high-performance steel with zero CO_2 emissions is essential for a sustainable world. Huge R&D and equipment replacement costs will be inevitable as JFE executes strategies targeting carbon neutrality. Society must decide how these costs should be shouldered, including government support.

Working toward the lofty goal of carbon neutrality by 2050, JFE is focusing on establishing the necessary decarbonization technologies as quickly as possible, ahead of global competitors, assuming that we have the decarbonization infrastructure in place and ability to compete on an equal footing globally.

■ JFE Group's Activities for Carbon Neutrality



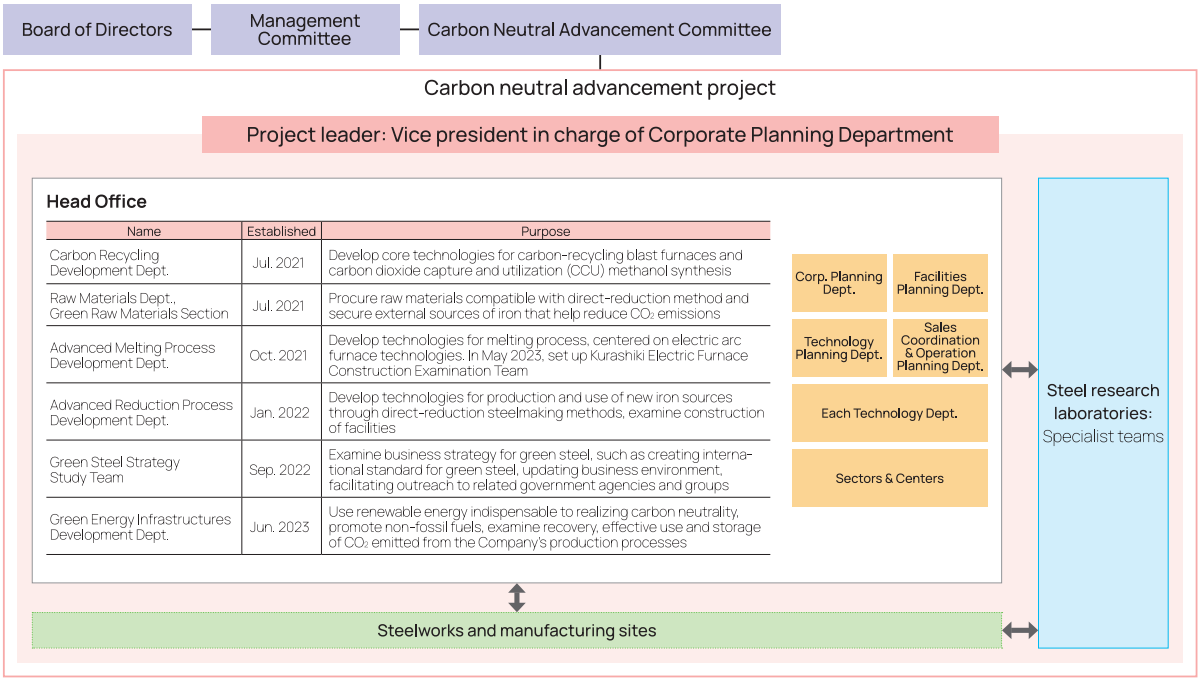
Management Structure

JFE Steel's Management Structure to Promote Carbon Neutrality

In May 2023, JFE Steel established the Kurashiki Electric Furnace Construction Examination Team within the Advanced Melting Process Development Department to quickly and efficiently introduce a new high-efficiency, large-scale electric furnace at the West Japan Works (Kurashiki district). In addition, we dissolved the CCUS* & Green Infrastructure Study Team and established the Green Energy Infrastructures Development Department in June 2023 to promote the use of renewable energy and non-fossil fuels toward achieving carbon neutrality by 2050 and to rapidly promote the capture, effective use, and storage of CO_2 emitted from our production processes.

*Carbon dioxide capture, utilization and storage

■ JFE Steel's Management Structure to Promote Carbon Neutrality



Information Disclosure Based on TCFD Recommendations

On May 27, 2019, JFE Holdings announced its endorsement for the final report of the Task Force on Climate-related Financial Disclosures (TCFD)*.

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

*The TCFD was established by the Financial Stability Board (FSB) at the request of G20 finance ministers and central bank governors.

Climate-related risks and opportunities will significantly impact medium- to long-term corporate finance. To reduce the risk of instability in the financial market, the G20 called on the FSB to establish the TCFD. The TCFD considers disclosure methodologies that can be used to appropriately assess climate-related risks and opportunities and releases its findings as a final recommendations report.

It is important for investors to accurately understand the financial impact of climate-related risks and the opportunities of investee companies when they make financial decisions. In this context, the task force recommends disclosures to be made in four core elements of organizational management: governance, strategy, risk management, and metrics and targets.

For the TCFD content index, click on the following link.

➤ Guideline Content Indices (P. 268)

Governance

Under the JFE Group Standards of Business Conduct, the JFE Group actively strives to exist in harmony with the global environment and create a society that is comfortable and convenient. We are aware that efforts to protect the global environment, such as reinforcing our environmental protection activities and addressing climate change issues, are extremely important for creating a sustainable society.

In FY2016, we identified the mitigation of global warming as a material CSR issue to facilitate the PDCA cycle and promote appropriate management of ongoing initiatives, such as reducing CO_2 in the iron and steelmaking processes and developing and providing eco-friendly products. In 2021, we relaunched the initiative as a top priority by adding economic perspectives to the material issues and by selecting other vital matters of importance. As part of this effort, we set our goal for helping to address climate change (initiatives to achieve carbon neutrality by 2050) as an area of focus and identified reducing the JFE Group's CO_2 emissions and contribution to CO_2 emissions reduction in society as two material issues.The JFE Group Environmental Committee, chaired by the president of JFE Holdings and operating under **the JFE Group CSR Council**, supervises and guides these initiatives by deliberating goals, monitoring progress, and improving the Group's overall environmental performance.

The JFE Group Environmental Committee, chaired by the president of JFE Holdings and operating under the JFE Group Sustainability Council, supervises and guides these initiatives by deliberating goals, monitoring progress, and improving the Group's overall environmental performance.

Key managerial issues such as climate change and other environmental challenges are deliberated at **the Group Management Strategy Committee** as well and reported to **the Board of Directors**. The board discusses and makes decisions on the matters reported.

■ Examples of Climate Change-Related Agenda Items Involving Board of Directors Decisions and Reports

- Declaration of endorsement for the final TCFD recommendation report
- Information disclosure consistent with TCFD recommendations (scenario analysis and other information)
- Formulation of the Seventh Medium-term Business Plan, JFE Group Environmental Vision for 2050
- Review the CO_2 emissions reduction target for FY2030
- Use of climate-related metrics to determine executive remuneration

➤ Corporate Governance System (P.205)
➤ Framework for Environmental Management (P.47)

Addressing Climate Change Issues

Contribute to the realization of a carbon-neutral society by developing decarbonization processes, supplying green steel products, and expanding technologies that reduce CO_2 emissions

Having positioned climate change as a top management concern, JFE Group formulated the JFE Group Environmental Vision for 2050 and presented an actionable roadmap for achieving carbon neutrality by 2050. We have positioned the timeframe up to 2030 as the transition phase for shifting to low-carbon manufacturing processes and up to 2050 as the innovation phase in which to establish and implement our ultra-innovative technologies and achieve carbon neutrality. We have accordingly developed a concrete CO_2 reduction plan and are working on initiatives for achieving it. In the steel business, we have decided to strengthen the operation of the electric furnace at the Sendai Works and introduce an electric furnace in the stainless steel manufacturing process in the Chiba district to achieve a reduction by 30% or more by FY2030 (compared to FY2013), in addition to introducing a process that increases the volume of scrap for use in converters at all sites. We are also considering the introduction of a high-efficiency, large-scale electric furnace in the Kurashiki district, and we will continue to steadfastly make the necessary capital investments to achieve our 2030 target. To advance our multi-track development of technologies for a carbon recycling blast furnace, hydrogen steelmaking (direct reduction), and a high-efficiency, large-scale electric furnace, we started constructing test furnaces for verifying each technology in the Chiba district in FY2023. These test furnaces are important first steps in the long-term development of carbon-neutral ironmaking and will boost the efficiency of developing ultra-innovative technologies and help to quickly realize applications.

In addition, as the demand for decarbonization accelerates throughout the supply chain, the demand for green products that emit less CO_2 in the manufacturing process is also rising. In the first half of FY2023, JFE Steel began supplying JGreeX™, a brand of green steel products that significantly reduce CO_2 emissions in the steel manufacturing process compared to conventional products. JGreeX™ products have already been adopted for a variety of applications. In the initiative to use JGreeX™ for the construction of dry bulk carriers (large cargo ships), we constructed the world's first business model for sharing the associated cost of reducing CO_2 emissions across the supply chain, and we are allowed to charge a green premium of about 40% for the product. The widespread recognition of the environmental value of green steel products is important for helping us obtain the necessary funding for the capital investment and development of ultra-innovative technologies for achieving carbon neutrality. We will strive to create a market for green steel products that can contribute to realizing a carbon-neutral society.

Another area of focus in the JFE Group Environmental Vision for 2050 is to expand our contribution to reducing CO_2 emissions in society as a whole. In the engineering business, in addition to expanding our renewable power generation plant businesses, we have started the commercial operation of the PET bottle recycling raw material manufacturing plant (West Japan PET Bottle MR center). This is a bottle-to-bottle business initiative, and the plant has the capacity to recycle approximately 10% of the total number of PET bottles shipped nationwide.In the steel business, we have decided to bolster the manufacturing capacity at the West Japan Works (Kurashiki district) for high-grade, non-oriented electromagnetic steel sheets, for which demand is expected to expand for electric vehicles. In the trading business as well, we will reinforce our supply system for electromagnetic steel sheets to ensure that we capture the growing demand. We consider this as a fresh business opportunity for applying our advanced technologies to contribute to creating a sustainable society, and we will take advantage of these opportunities to grow our businesses and enhance our corporate value.

Furthermore, we are working on an initiative for contributing to the offshore wind-power generation business by applying the strengths of the Group. With JFE Engineering as the main driver, we started constructing the manufacturing plant for monopiles and other seabed-fixed structures and plan to start production in 2024. Offshore wind-power generation business can take full advantage of the capabilities of all our operating companies, and so we will continue to make a Group-wide effort to accelerate this business.

Our key strategies for achieving carbon neutrality by 2050 are to reduce CO_2 emissions at JFE Steel and expand contributions to CO_2 reduction for society as a whole. We view society's shift toward decarbonization as a business opportunity and are committed to playing our part in realizing a sustainable society developing and quickly implementing decarbonizing technologies and creating products and services that contribute to a decarbonized society.

Seiya Kitajima
Senior Executive Officer,
JFE Holdings, Inc.

JFE Group's Climate Change Strategy

Various risks and opportunities related to climate change are integrated into the JFE Group's business strategy. The Group formulated the Seventh Medium-term Business Plan as the main guide for business operations from FY2021 to FY2024, and we positioned efforts to address climate change as the key to achieving sustainable growth and increased value over the medium to long term. Under the plan, the Group defined ensuring environmental and social stability as a core strategy and **formulated the JFE Group Environmental Vision for 2050 for achieving carbon neutrality by 2050**. Then we concentrated our efforts on our business strategy and **reflected the principles of the TCFD recommendations in our management strategy**, enabling us to systematically address climate change. Furthermore, we are disclosing information based on the TCFD recommendations, including the scenario analysis, leveraging them to identify and evaluate risks and opportunities, and reflecting them in our management strategy.

For further details on the Results of Scenario Analysis and the JFE Group Environmental Vision for 2050, refer to the following source material.

➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
➤ JFE Group Environmental Vision for 2050, Presentation Material
(https://www.jfe-holdings.co.jp/en/investor/zaimu/g-data/2020/May2021-210525-release01.pdf)

In the JFE Group Environmental Vision for 2050, our efforts to achieve carbon neutrality are based on the following three key strategies: reduce CO_2 emissions at JFE Steel, expand contributions to the reduction for society as a whole, and accelerate Group-wide commercialization of the offshore wind-power business. In the steelmaking process, along with efforts to reduce CO_2 emissions, we will also actively work on reducing environmental impact through reusing water resources and energy, developing environmentally sound products and process technologies, and providing resource recycling solutions.

Reduce CO_2 Emissions at JFE Steel

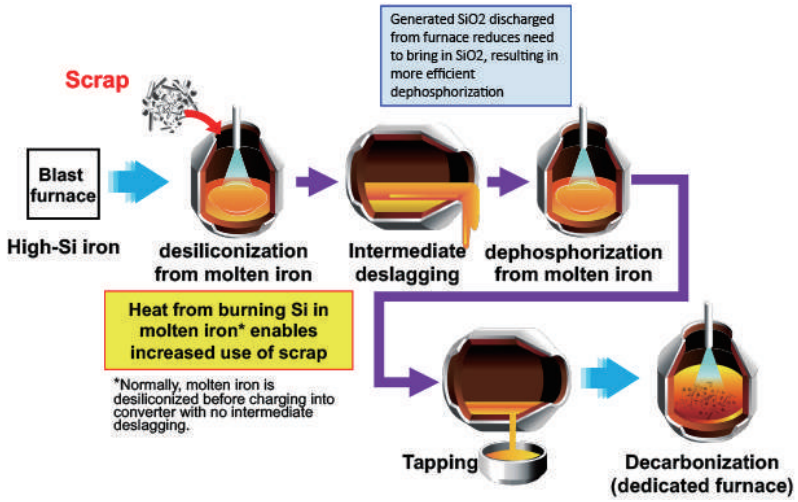
The JFE Group has adopted a multipronged approach, including the development of ultra-innovative technologies, to achieve carbon neutrality by 2050. In the steel business, we have set a target for reducing CO_2 emissions by 18% as of the end of FY2024 and by 30% or more by FY2030, compared to FY2013. We have defined the period up to 2030 as a transition phase and the period after that as an innovation phase. In the transition phase, we will focus more on initiatives to reduce emissions through an expanded application of low-carbon technologies to steadily advance toward achieving the CO_2 reduction target in FY2030. In this phase, we will also accelerate the development of ultra-innovative technologies to prepare for the innovation phase. In the innovation phase, we will advance initiatives for the wise use of resources, including the commercialization of carbon-recycling blast furnaces that leverage our proprietary carbon-recycling technology and direct-reduction steelmaking, as well as the expansion of CCU applications. Furthermore, we will undertake CO_2 sequestration through CCS to create a carbon-neutral society together with local communities and industrial complexes. We will achieve carbon neutrality through initiatives under these three themes.

Increased Use of Scrap Iron in Steelmaking

JFE Steel completed introducing the Double-slag Refining Process (DRP®), an eco-friendly converter-type molten-iron pretreatment process, in all of its sites in 2021. This increased the amount of scrap iron to be used in converters, leading to reduced CO_2 emissions.

DRP makes full use of silicon in molten iron as a heat source, thereby increasing the amount of scrap iron to be used in converters. It allows reducing the molten-iron blending ratio (molten iron vs. scrap charged into the converter) to 82%, down from 90% through conventional methods. The Company introduced this process in all of its steelmaking facilities, and the increased use of scrap iron in converters enabled us to reduce CO_2 emissions by approximately 0.17 million tons per year in FY2021. In the future, we will develop technologies to increase heating margins to further boost the use of scrap and invest in facility expansion to reduce CO_2 emissions by about 2 million tons per year by FY2030.

■ **Eco-friendly converter-type molten iron pretreatment process DRP®: Double-slag Refining Process**

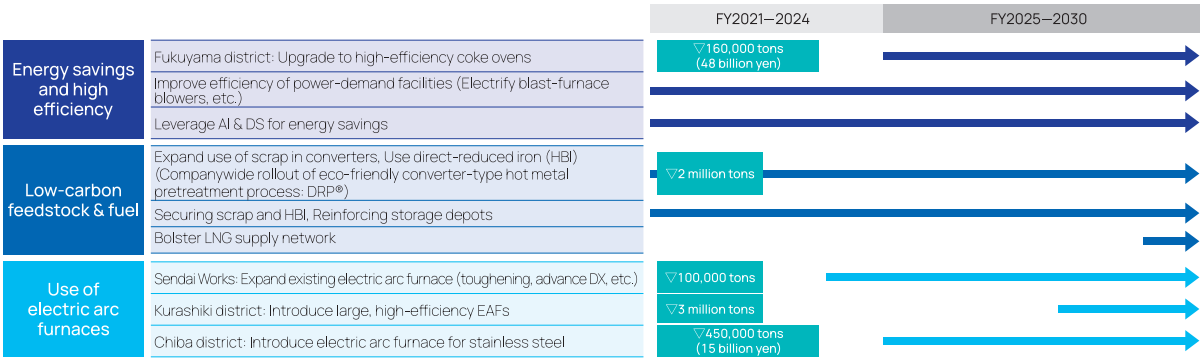


East Japan Works (Chiba District) to Produce Stainless Steel with Electric-Arc Furnace

JFE Steel has decided to install a new electric-arc furnace at the No. 4 steelmaking shop at the East Japan Works (Chiba district) in the second half of FY2025 (planned). Scrap melting capacity is expected to increase by up to six times compared to the conventional process, to approximately 300,000 tonnes per year (planned), and CO_2 emissions are expected to be reduced by up to about 450,000 tonnes per year. We have defined the period up to 2030 as a transition phase toward carbon neutrality and consider the electric furnace process to be an effective means of reducing CO_2 emissions. Looking ahead, we will continue to develop ultra-innovative technologies in a multi-pronged approach and make steady progress toward realizing carbon neutrality.

Transition to Low-Carbon Steel Processes

Our multi-pronged approach includes developing ultra-innovative technologies for achieving carbon neutrality by 2050. We have defined the period up to 2030 as a transition phase and the period after that as an innovation phase. In the transition phase, the steel business is promoting energy-saving and high-efficiency improvements in existing processes and the use of electric furnace technology. We anticipate that achieving the CO_2 reduction target for FY2030 may require investments and loans of around one trillion yen, and approximately 110 billion yen has been approved by FY2022. We intend to steadily advance toward obtaining the necessary investments and loans to achieve the reduction target.



Started supplying JGreeX™ green steel products

■ Name origin: JFE + Green + GX
We invited the relevant departments to propose names and selected this name from the suggestions because it clearly expresses being a green steel product provided by JFE Steel.

■ Logo design:
The logo combines the letter X with an arrow to express our intention to move forward toward carbon neutrality.

In the first half of FY2023, JFE Steel began supplying JGreeX™, a brand of green steel products that significantly reduce CO_2 emissions in the steel manufacturing process compared to conventional products. At present, it is difficult to immediately supply green steel products with significantly lower or zero emissions, so the reductions created by our technologies are allocated to specific steel products by applying the mass balance method*1 and then supplied as green steel products. With regard to the amount of CO_2 emission reductions and the emission intensity of each product, we have obtained a third-party certification from Nippon Kaiji Kyokai (ClassNK), which verified 520,000 tonnes of CO_2 emission reduction in FY2022.

JGreeX™ green steel products have been selected by Tsuneishi Shipbuilding Co., Ltd. for the planned construction of tugboats fitted with hydrogen co-combustion engines. JFE Steel will start supplying JGreeX™ products to Tsuneishi from September 2023.

In addition, JGreeX™ green steel products have been selected for constructing new dry bulk carriers*2, a joint initiative with eight participating companies: NYK Bulk & Projects Carriers, Ltd., MOL Drybulk Ltd., Toko Kaiun Kaisha, Ltd., Kawasaki Kisen Kaisha, Ltd., Kawasaki Kinkai Kisen Kaisha, Ltd., Daiichi Chuo Kisen Kaisha, Ltd., Daiichi Chuo Kinkai Kaisha, Ltd., and Eastern Car Liner, Ltd .

All of the steel materials*3 to be used in the construction of these ships will be exclusively JGreeX™, which generates net zero CO_2 emissions in the manufacturing process, making these ships the first in the world to use only green steel materials. This is also the first time that shipping companies and JFE Steel, which also engages in shipping activities, have jointly established a new business model (see diagram below) in which the costs of CO_2 reduction are shared across the entire supply chain.

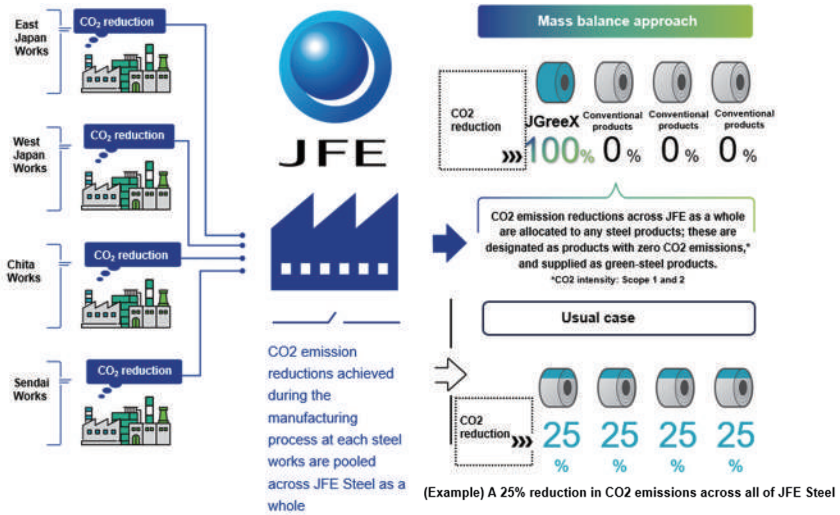
In FY2023, JFE Steel expects to deliver 14,000 tons of JGreeX™ products to two shipbuilders, Onomichi Dockyard Co., Ltd and Higaki Shipbuilding Co., Ltd., for use in four vessels to be commissioned between September 2024 and January 2025 by shippers NYK Bulk & Projects Carriers, MOL Drybulk, and Toko Kaiun.

Reduction of CO_2 throughout the supply chain is rapidly progressing. JFE Steel will contribute to the decarbonization of society by expanding its capacity for supplying JGreeX™ and further reducing CO_2 emissions through the use of advanced low-carbon technologies as well as energy-saving, high-efficiency technologies.

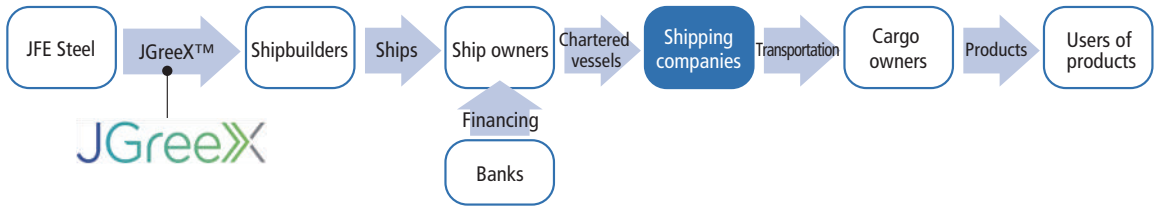
■ JGreeX™ supply overview

Start of supply	First half of fiscal 2023
Supply capacity in fiscal 2023	Approximately 200,000 tons
Applicable products	All steel products manufactured by JFE
Certification organization	Nippon Kaiji Kyokai

■ Concept of Green Steel JGreeX™



■ **JGreeX™ supply overview**



*1 Consolidate the environmental value of CO_2 emission reduction from the entire product manufacturing process, allocate the value to some steel products, and regard them as having low CO_2 emission intensity.
*2 Cargo ships that transport large quantities of dry cargo
*3 Steel products purchased directly by shipbuilding companies

Demonstration Tests for NEDO Project: Hydrogen Utilization in Iron and Steelmaking Processes

In preparation for the innovation phase, we are researching and developing ultra-innovative technologies such as carbon-recycling blast furnaces and hydrogen steelmaking (direct reduction), for achieving carbon neutrality by 2050.

To this end, the company formed a consortium with Nippon Steel Corporation, Kobe Steel, Ltd., and the Japan Research and Development Center for Metals and jointly commissioned the New Energy and Industrial Technology Development Organization's (NEDO's) Green Innovation Fund Project: Hydrogen Utilization in Iron and Steelmaking Processes.

In order to further advance the development of ultra-innovative technologies to achieve carbon neutrality by 2050, JFE Steel has decided to construct all the necessary facilities for the demonstration tests for the project centrally in the East Japan Works (Chiba district) to increase the efficiency of the development effort. We will work together with consortium members to accelerate the development of ultra-innovative technologies.

Details of the Planned Demonstration Tests

- **Carbon-recycling pilot blast furnace (150m³)**
  Start construction in 2023, start demonstration tests in April 2025, complete demonstration tests by 2026
- **Direct reduction compact bench pilot furnace**
  Start construction in 2023, start demonstration tests in 2024, complete demonstration tests by 2026
- **Pilot electric arc furnace (10 t pilot furnace)**
  Start construction in 2023, start demonstration tests in 2024, complete demonstration tests by 2025

Details for each are as follows.

Carbon-Recycling Blast Furnaces (CR Blast Furnace)

We will work on developing carbon-recycling blast furnaces (CR blast furnaces), hydrogen steelmaking (direct reduction), and electric arc furnace process (high-efficiency, large-scale electric arc furnaces) while also striving to achieve carbon neutrality by 2050, as announced in the JFE Group Environmental

Vision for 2050. We are particularly focused on a technology that combines a CR blast furnace and CCU*, which allows us to efficiently mass produce high-grade steel and reuse the CO_2 in the blast furnace. This technology is focused on achieving virtually zero emissions by using the remaining CO_2, which cannot be fully reused to manufacture basic chemicals such as methanol.

*Carbon dioxide capture and utilization

Technical Features of a CR Blast Furnace

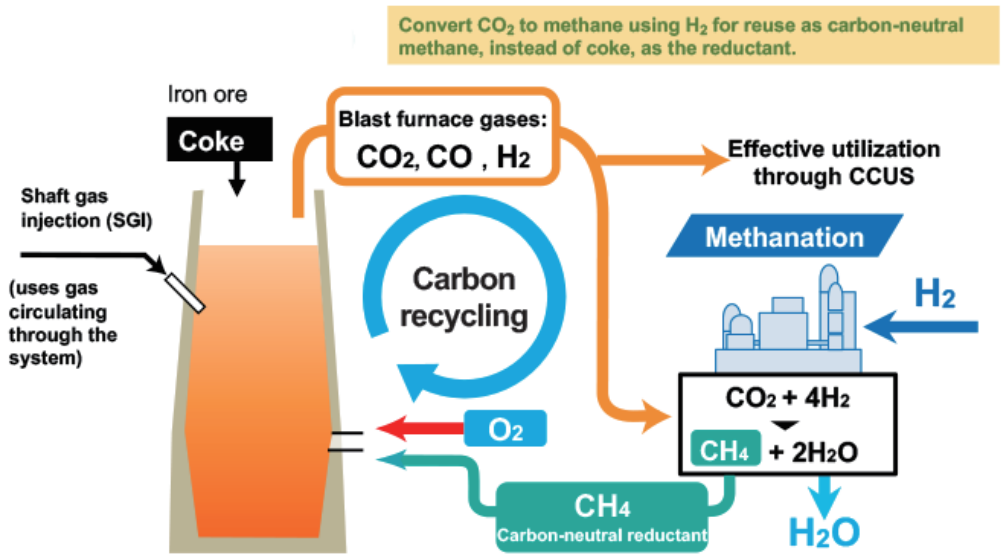
The CR blast furnace incorporates an ultra-innovative technology that converts CO_2 in the furnace exhaust gas into carbon-neutral methane through methanation, which is then reused as reducing material in the furnace.The technology is expected to reduce CO_2 by 50% in the blast furnace process and to ultimately help achieve carbon neutrality by leveraging CCU/CCUS*. The thermal efficiency of the process can be further enhanced by replacing the air blown into the blast furnace with pure oxygen, as the energy used to heat the nitrogen in the air can then be used to heat methane. In addition, the lack of nitrogen facilitates the separation of CO_2, so the equipment necessary to separate CO_2 for methanation can be more compact and efficient while more effectively using gas at CCUS.

Overview of the Demonstration Tests

We are planning to develop a process that converts the CO_2 produced in the blast furnace into methane using hydrogen, allowing the carbon to be repeatedly used in the furnace as a reducing agent and thus reducing CO_2 emissions. We will verify the following during demonstration tests.

- Methods for blowing a large volume of methane along with oxygen into the furnace
- Applications for the heating burner that uses the circulation gas
- Methods for linking the operations of the furnace and the methanation facility that converts CO_2 from the blast furnace gases to methane

■ **Overview of Carbon-recycling Directs Furnaces**



Development of Direct Hydrogen Reduction Technology (Carbon-Recycling Direct Reduction Process)

Hydrogen reduction ironmaking technology is another steelmaking process that the JFE Group is working on to achieve carbon neutrality. With this technology, the natural gas currently used in direct reduction ironmaking is replaced by 100% hydrogen to eliminate CO_2 emissions when iron ore is reduced.

Technology for Processing Raw Materials

Currently, the only raw material that can be used for direct reduction ironmaking is high-grade iron ore. Its production volume, however, is limited, and we expect it will become even more difficult to obtain in the future if direct reduction ironmaking were to expand worldwide.

To address this, JFE and one of its iron ore suppliers, BHP, are collaborating in the development of a new raw material processing technology for low- and medium-grade ores, which are currently used as raw materials for blast furnaces due to their large production volume. We are hoping that this new technology will allow us to use low- and medium-grade ores as raw materials for direct reduction ironmaking, thus expanding the raw material sourcing for direct reduction ironmaking.

Technology for Pre-Heating Raw Materials, Technology for Heating Hydrogen Gas

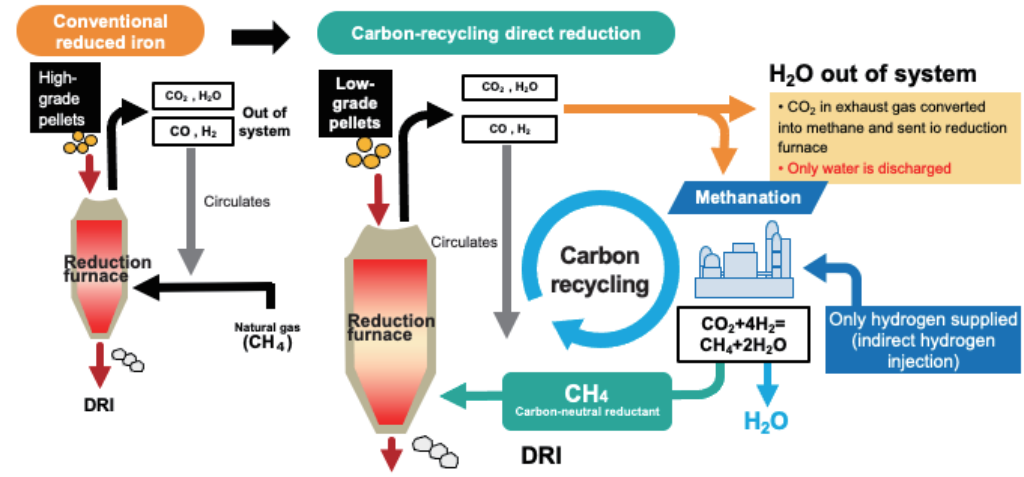
One challenge of hydrogen reduction is that the reduction of iron ore by hydrogen is an endothermic reaction, which means that heat must be applied externally for the reaction to proceed. A sufficient reduction reaction may not take place if there is not enough heat. Thus, technologies for heating raw materials and hydrogen gas must be developed.

Overview of the Demonstration Tests

We are developing a process to convert the CO_2 produced in the direct-reduction furnace into methane using hydrogen, allowing the carbon to be repeatedly used in the furnace as the reducing agent and thus reducing CO_2 emissions. We will verify the following during demonstration tests.

- Optimal methods for recycling CO_2 through methanation
- Methods for using low-grade ores

■ **Carbon-Recycling Direct Reduction Process**



Development of Electric Arc Furnace Process Technology

An electric arc furnace process is one of the JFE Group's development efforts in steelmaking technologies for carbon neutrality. With this technology, steel products are manufactured by melting steel scrap and direct-reduced iron in an electric arc furnace. So far, we have managed to reduce CO_2 emissions from this steelmaking process down to one-quarter of that of the blast furnace-converter method. We are striving to eliminate CO_2 emissions generated by the electric arc furnace process in the future by using the aforementioned hydrogen-reduced iron as the raw material and green electricity.

Although the electric arc furnace process has the advantage of reducing CO_2 emissions, there are two major problems compared to the blast furnace-converter method: the productivity of the electric arc furnace process in general is about 30% lower than that of the blast furnace-converter method, and the use of scrap as the raw material inevitably increases the concentration of impurities, which limits the production of high-quality, high-performance steel products. We are working to address these issues and striving to establish technologies that will enable the production of high-quality, high-performance steel with high productivity using the electric arc furnace process.

Use Electric Arc Furnaces to Increase the Use of Scrap

JFE Steel is planning to increase the production capacity of the electric arc furnaces in the Sendai Works by approximately 0.14 million tonnes per year by FY2024 through reinforcing the electric arc furnaces in the Sendai Works, implementing capacity-boosting DX measures, and improving the load handling equipment. This is expected to result in a reduction of approximately 0.10 million tons of CO_2 emissions per year.

We are planning to install a new electric arc furnace in the Chiba district for stainless steel production. This will allow the facility to replace part of the feedstock from molten iron from blast furnaces with scrap and thus reduce CO_2 emissions. This could increase by up to six times the volume of scrap used, and we expect to reduce CO_2 emissions by a maximum of about 450,000 tons per year.

Furthermore, in the Kurashiki district, we are considering switching to a newer process technology by replacing one of the blast furnaces, which needs to undergo preventive maintenance within the period of 2027–2030, with a large, high-efficiency electric arc furnace.

Feasibility Study on New Venture Business to Secure Reduced Iron Supply

In the transition phase up to 2030, we expect a shortage in domestic scrap supply. The use of direct-reduced iron is considered an effective way to supplement this in the production of high-quality steel using electric arc furnaces and in the reduction of CO_2 emissions from blast furnaces.

JFE Steel has agreed with Emirates Steel Arkan (Emirates Steel), the largest steel producer in the UAE, and ITOCHU Corporation (ITOCHU) to jointly conduct detailed feasibility studies on the establishment of a supply chain of reduced iron with low carbon emissions. Under a joint venture to be established in the UAE, we are focusing on producing direct-reduced iron with low carbon emissions from the second half of FY2025 using CCUS (EOR*), which takes full advantage of the geographic location of the UAE.

Collaboration to Establish a Supply Chain of Ferrous Raw Material for Green Ironmaking with Low Carbon Emissions

JFE Steel has signed a memorandum of understanding (MOU) with ITOCHU, Emirates Steel, and the Abu Dhabi Ports Group (ADPG) to develop collaborative systems for the establishment of a supply chain to handle ferrous raw material for green ironmaking with low carbon emissions. The four companies exchanged their MOU in the presence of Japanese Prime Minister Fumio Kishida at the Japan-UAE Business Forum that was held on July 17.

We view Direct Reduced Iron as a key initiative for CO_2 emissions reduction and are participating with Emirates Steel and Itochu as core members in the establishment of a supply chain of Green Ferrous Material. The companies are jointly promoting a detailed feasibility study at the planned project site in Abu Dhabi.

ADPG, the state-owned port operator and economic and industrial zones developer in Abu Dhabi in which the project is planned to be developed, owns 10 ports and 550km2 of economic and industrial areas.

The parties have agreed that ADPG will participate fully in project-related port development and operations, land leasing and services, and infrastructure development. Collaboration with ADPG will provide the undertaking with access to a suitable site for building a distribution and logistics system capable of stably importing raw materials and shipping products for the envisioned supply chain.

*Enhanced oil recovery

- Overview of Emirates Steel
  Company name: Emirates Steel Arkan
  Representative: HE Engineer Saeed Ghumran Al Remeithi (Group CEO)
  Business: Steel

- Overview of ADPG
  Company name: Abu Dhabi Ports Group
  Representative: Captain Mohamed Juma Al Shamisi
  Business: Port operations, shipping, logistics and special economic zone development

Improve productivity of the electric arc furnace process

To improve productivity of the electric arc furnace process, the JFE Group have developed ECOARC™, our proprietary, eco-friendly, high-efficiency electric arc furnace, and installed it at our operating companies. With this technology, a shaft is attached to the upper part of the electric arc furnace and is used to continuously feed scrap materials into the furnace. It uses the high-temperature exhaust gas from the furnace to preheat the scrap material, allowing for subsequent high-efficiency and high-speed melting. As well as improving the productivity of the electric arc furnaces, the technology also reduces the energy (electricity) required for the melting process.

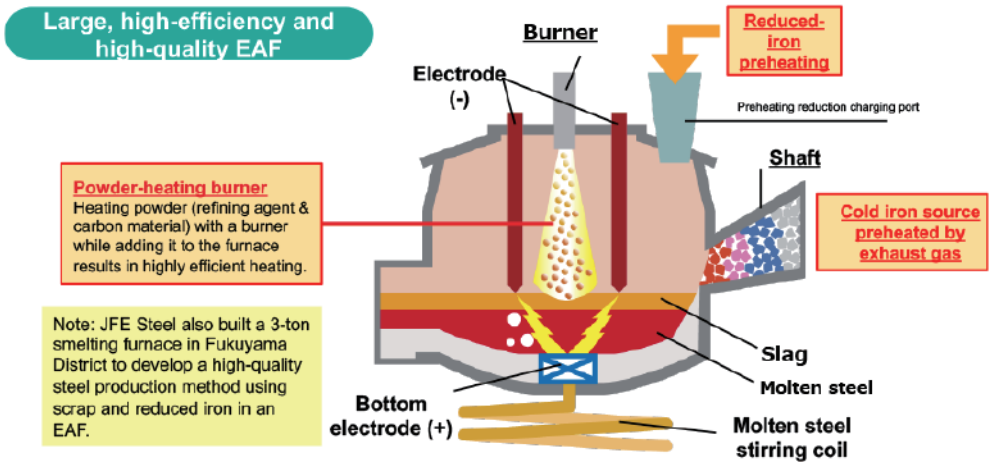
The Group already has achieved industry-leading productivity and energy (electricity) efficiency with these technologies, but we are working to raise productivity even further.

Overview of the Demonstration Tests

We are developing a process that reduces the electric arc furnace's melting power consumption and also enables high-speed melting of cold iron sources (scrap and reduced iron). We will verify the following during demonstration tests.

- Optimal methods for preheating and feeding reduced iron
- Methods for using heating burners
- Optimal methods for molten steel stirring

■ Research and Development for Electric Arc Furnaces



Manufacturing Higher-Grade Steels Using the Electric Arc Furnace Process

The electric arc furnace process uses scrap and reduced iron as raw materials. The higher concentration of impurities in these materials, such as copper, causes material degradation, including surface defects and reduced workability in steel sheets and deterioration of properties in electrical steel sheets. We are working on two technologies to address the issue, one to remove impurities and another to detoxify impurities, so that we can use the electric arc furnace process to produce high-grade steel products such as steel sheets for automobiles and electrical steel sheets.

Practical Applications of CO_2 Utilization Technologies

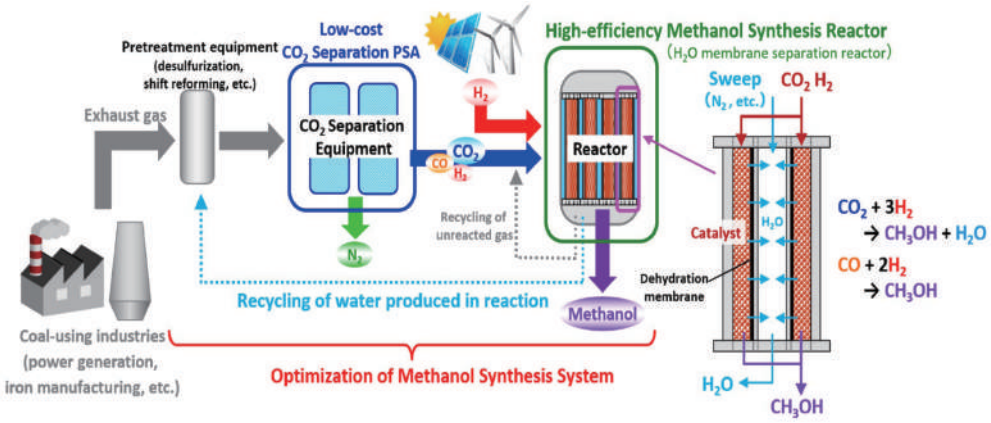
JFE Steel is working on the Optimum System for Methanol Synthesis Using CO_2, an R&D project, in collaboration with the Research Institute of Innovative Technology for the Earth (RITE) (Figure 1). On-site construction of a test facility commenced in FY2022 in the Fukuyama district of the West Japan Works, with operations scheduled to start in FY2023 and integrated practical application tests to be completed by the end of FY2025. The project focuses on establishing an optimal overall methanol synthetic system, mainly by developing technologies for low-cost CO_2 separation and high-efficiency methanol synthesis. The ultimate goal is to combine this newly established system with carbon-recycling blast furnaces and other ironmaking processes to achieve large-scale CCU process.

JFE Steel is also working on an R&D project, Innovative CO_2 Sequestration Technology through Quick, Large-quantity Carbonation of Steel Slag, in collaboration with Ehime University (Figure 2). Construction for a practical application test facility is scheduled to commence in FY2023 in the Chiba district of the East Japan Works. The process principles will be verified by FY2022, and tests will be conducted during the FY2024–FY2025 period. The project will develop a new technology to sequester the CO_2 generated from ironmaking processes such as carbon-recycling blast furnaces and from nearby thermal power plants in slag, and at the same time verify technologies for recovering heat after carbon sequestration and for converting the steel slag to roadbed materials and other products.

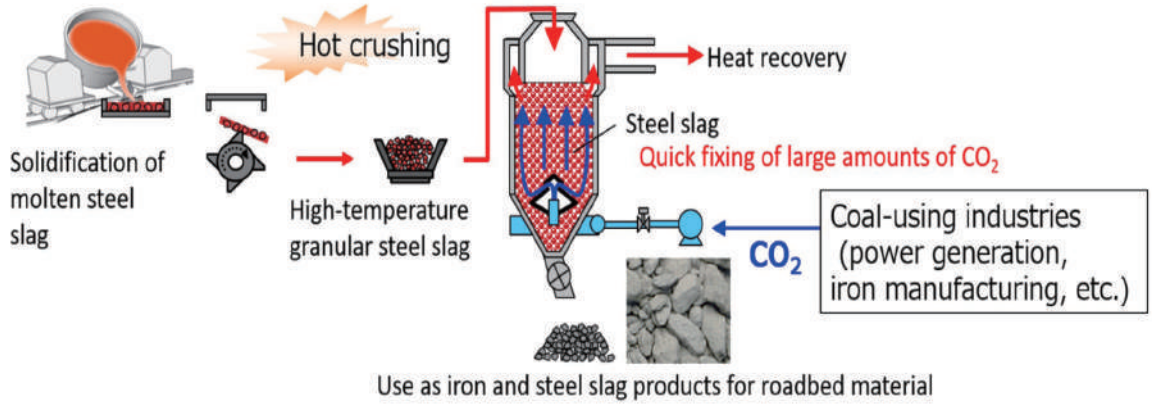
Furthermore, JFE Steel, Japan Petroleum Exploration Co., Ltd., JGC Holdings Corporation (JGC HD), and Kawasaki Kisen Kaisha, Ltd. ("K" LINE) have agreed to conduct a joint evaluation for establishing a CCS value chain originated from Japan, aligned with the joint study on CCS in Malaysia with Petroliam Nasional Berhad (PETRONAS). Under this joint effort, the four companies will conduct evaluations to establish a CCS value chain, from CO_2 separation and capture at JFE's steelworks, to

marine transportation of liquefied CO_2 to the receiving points in Malaysia, including estimation of required facilities and costs. These evaluations will also be appropriately aligned with the study of CO_2 receipt and storage in Malaysia within the scope of the Study with PETRONAS. By establishing an international CCS value chain through this joint effort, JFE Steel, JAPEX, JGC Holdings, and "K" LINE aim to contribute to realizing carbon neutrality by 2050, including the realization of de-carbonized society in Asia targeted by Asia Energy Transition Initiative *.

■ **Figure 1**



■ **Figure 2**



*The Japanese Government's initiative announced in May 2021 for simultaneously achieving sustainable economic growth and carbon neutrality in Asia.

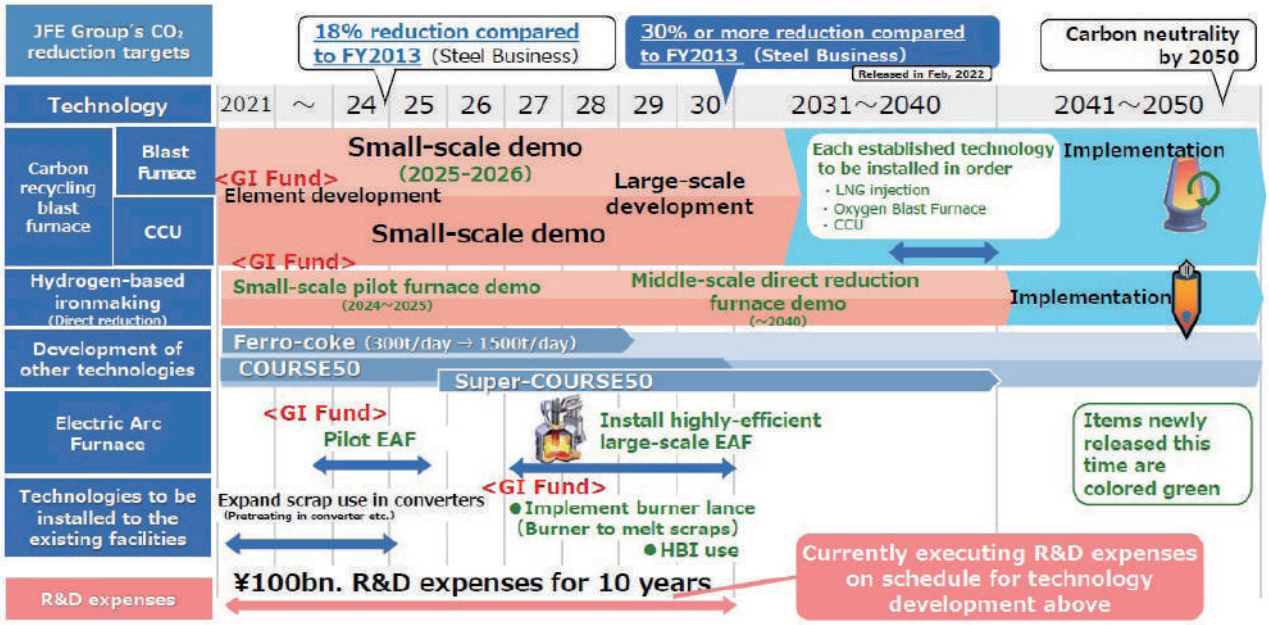
➤ Development and Provision of Eco-friendly Processes and Products (P.108)

■ Related Products and Technologies

Reduce CO_2 Emissions at JFE Steel		
Carbon neutrality	Key Initiatives	JFE Steel Carbon Neutrality Strategy Briefing (https://www.jfe-steel.co.jp/en/company/pdf/carbon-neutral-strategy_220901_1.pdf)
		JFE Steel Challenge to Achieve Carbon Neutrality through Green Transformation (https://www.jfe-steel.co.jp/en/movie/#movie-gx)
	Demonstration tests	Demonstration Tests for NEDO's Hydrogen Utilization in Iron and Steelmaking Processes project (Japanese only) (https://www.jfe-steel.co.jp/release/2022/06/220615-2.html)
Green steel products	Begin supplying green steel products	JFE Steel to Begin Supplying JGreeX™ Green Steel (https://www.jfe-steel.co.jp/en/release/2023/230508-2.html)
	Adoption of green steel products	JFE Steel's JGreeX™ Green Steel Selected by Tsuneishi Shipbuilding for Construction of Hydrogen-fueled Tugboats (https://www.jfe-steel.co.jp/en/release/2023/230620-1.html)
		Large Cargo Ships to be Made Exclusively with JFE Steel's JGreeX™ Green Steel (https://www.jfe-steel.co.jp/en/release/2023/230620-2.html)
Carbon-recycling blast furnace	Carbon-recycling blast furnace technology	JFE Steel Carbon Neutrality Strategy Briefing: Reducing CO_2 via CR Blast Furnaces (https://www.jfe-steel.co.jp/en/company/pdf/carbon-neutral-strategy_220901_1.pdf)
		Challenge Zero: Challenge for development of super-innovative technologies focusing on Carbon-recycling Blast Furnace+CCU (https://www.challenge-zero.jp/en/casestudy/812)
	CCU/CCUS	Challenge Zero: Technology of CO_2 utilization (https://www.challenge-zero.jp/en/casestudy/391)
New technology to process raw materials for hydrogen reduction ironmaking	Development of technology for direct hydrogen reduction	JFE Steel Carbon Neutrality Strategy Briefing: Direct Hydrogen Reduction (https://www.jfe-steel.co.jp/en/company/pdf/carbon-neutral-strategy_220901_1.pdf)
	Collaboration with a material supplier	JFE Steels and BHP to address decarbonization in steelmaking process (https://www.jfe-steel.co.jp/en/release/2021/210210.html)
Expanded use of scrap and reduced iron	Eco-friendly converter-type molten iron pretreatment process DRP®	Increased Use of Scrap Iron in Steelmaking Process to Reduce CO_2 Emissions (https://www.jfe-steel.co.jp/en/release/2022/220621.html)
	Feasibility study on new venture business to secure reduced iron supply	Feasibility Study on Building a Supply Chain of Reduced Iron with Low Carbon Emissions (https://www.jfe-steel.co.jp/en/release/2022/220901.html)
		Collaboration to Establish a Supply Chain of Ferrous Raw Material with Low Carbon Emissions (https://www.jfe-steel.co.jp/en/release/2023/230718.html)

Reduce CO_2 Emissions at JFE Steel		
Expanded use of scrap and reduced iron	Development of electric arc furnace process technology	JFE Steel Carbon Neutrality Strategy Briefing: Large, High-efficiency EAFs (https://www.jfe-steel.co.jp/en/company/pdf/carbon-neutral-strategy_220901_1.pdf)
	Adoption of electric arc furnace process technology	JFE Steel's Chiba District Facility to Produce Stainless Steel with Electric-arc Furnace (https://www.jfe-steel.co.jp/en/release/2023/230508-1.html)
CO_2 utilization and storage technology	CO_2 utilization technology	Novel Processes for Manufacturing Valuable Materials Using Coal-Derived CO_2 Selected for NEDO Projects (https://www.jfe-steel.co.jp/en/release/2021/211015.html)
	Testing for practical use	JFE Steel Moves Ahead with Testing CO_2-utilization Technologies Aimed at Achieving Carbon Neutrality (https://www.jfe-steel.co.jp/en/release/2022/220620-2.html)
	Establish CCS value chain	Agreed on Joint Evaluation with JFE Steel Corporation to Establish CCS Value Chain Originated from Japan Aligned with CCS Study in Malaysia (https://www.jfe-steel.co.jp/en/release/2023/230619.html)

■ **Related Products and Technologies**



Source: Material for the JFE Group's investors' meeting held on May 6

➤ Seventh Medium-term Business Plan (P.12)

➤ JFE Group Environmental Vision for 2050, Presentation Material
(https://www.jfe-holdings.co.jp/en/investor/zaimu/g-data/2020/May2021-210525-release01.pdf)

JFE Group Initiatives Aligned with the Paris Agreement

Under the JFE Group Environmental Vision for 2050, the JFE Group designed a roadmap for achieving carbon neutrality, which included our short-, medium-, and long-term CO_2 emission reduction targets. Until 2030, the Group will focus on fully using existing technologies to promote decarbonization while at the same time developing the ultra-innovative technologies needed to achieve carbon neutrality. The Group will then focus on commercializing the ultra-innovative technologies in the 2030s and 2040s, when we expect the required social infrastructure to be in place, to accelerate decarbonization toward achieving carbon neutrality by 2050.

The technology roadmap for Transition Finance toward decarbonization in the iron and steel sector, published by the Japanese Ministry of Economy, Trade, and Industry (METI), outlines a path for accelerating decarbonization and achieving carbon neutrality by introducing innovative technologies, with the same assumption that social infrastructure such as hydrogen supply and CCUS will be in place by the 2040s. This technology roadmap is aligned with Japan's Nationally Determined Contribution (NDC) based on the Paris Agreement, and is therefore aligned with the Paris Agreement.

In 2022, the JFE Group issued transition bonds through a public offering, which was selected as the first model example in the iron and steel sector for METI's Transition Finance Model Projects in FY2021. During the evaluation process for this issuance, the Group's initiatives were certified by a third party as being aligned with METI's roadmap. We can therefore deduce that they are also aligned with the Paris Agreement.

➤ **METI: Technology Roadmap for Transition Finance in the Iron and Steel Sector**
(https://www.meti.go.jp/policy/energy_environment/global_warming/transition/transition_finance_technology_roadmap_iron_and_steel_eng.pdf)

➤ **METI: Transition Finance Case Study**
(https://www.meti.go.jp/policy/energy_environment/global_warming/transition/transition_finance_case_study_jfehd_eng.pdf)

Expand Contributions to CO_2 Emissions Reduction in Society

Contribution to CO_2 Reduction through our Engineering Business

Demand is expected to rise for power generation plants using renewable energy sources that do not emit carbon. Through JFE Engineering, the JFE Group is handling the design, procurement, construction, and operation of various renewable energy generation plants including biomass, geothermal, solar, and onshore wind power. We are also working to increase the amount of power generated at waste treatment facilities in order to promote recycling and the effective use of resources.

Furthermore, we are actively engaged in the retailing of electricity, which uses these renewable energies as the main power source, supporting the establishment and operation of new regional electricity companies that focus on local production and consumption of energy using renewable sources, and in expanding the Multisite Energy Total Service (JFE-METS), which optimizes energy use for multiple sites within the same corporate group through centralized management.

As new initiatives for carbon neutrality, we are developing a technology to safety and efficiently transport large amounts of hydrogen, ammonia, and CO_2, and working on demonstrating a process that separates and collects CO_2 for reuse from the exhaust gas of waste treatment facilities.

As new initiatives for material recycling, we are working on bottle-to-bottle, an effort through which collected PET bottles are recycled and used as raw material for bottles, and the recycling of solar panels that are discarded due to age-related deterioration.

These will contribute to reducing CO_2 emissions in society by 12 million tonnes by FY2024 and 25 million tonnes by FY2030.

The following key initiatives contributed to CO_2 reduction in FY2022.

Large-Scale Biomass Power Generation

Started construction work for the Tahara Biomass Power Plant, one of the largest woody biomass combustion power plants in Japan, with an output of 112,000 kW.

Tahara Biomass Power LLC, a joint venture between JFE Engineering Corporation, Chubu Electric Power Co., Inc., Toho Gas Co., Ltd., and Tokyo Century Corporation, has started construction work on the Tahara Biomass Power Plant. The plant, to be constructed in Tahara, Aichi Prefecture, is one of the largest woody biomass power plants in Japan, with an output of 112,000 kW, and is scheduled to start operation in September 2025.

Food Waste Recycling Power Generation

Construction of a new food waste recycling biogas power generation plant in Fukuoka, Fukuoka Prefecture: J&T Recycling's first food recycling business in Kyushu.

J&T Recycling Co., a subsidiary of JFE Engineering, and Kankyou Agency have jointly established Fukuoka Bio Food Recycle Co. Ltd. in Fukuoka City to engage in the food waste recycling and biogas power generation business, in which food waste is collected and fermented to produce methane gas, which is then used as fuel to generate power. The plant to be built for the project will accept up to 100 tonnes of food waste per day and generate electricity using methane gas produced by microbial fermentation as fuel (output: 1,560 kW, estimated annual generation: approx. 12,000 MWh). The project will also support the secondary use of fermented sludge and digested liquid generated in the treatment process on nearby agricultural land.

We have other projects for expanding our food waste power generation businesses throughout Japan, including Tohoku Bio Food Recycle Corporation, which is started its food waste power generation in Sendai in May 2022, and Sapporo Bio Food Recycle Corporation in Sapporo, which is constructing a new plant to expand its capacity.

Multisite Energy Total Service (JFE-METS)

The House Foods Group has agreed to adopt the Multisite Energy Total Service at 17 sites across 8 group companies, driving CO_2 reduction.

JFE Engineering has signed a basic agreement with House Foods Group Inc. to provide JFE-METS. We will install a gas cogeneration system at the House Foods Shizuoka Plant and use JFE-METS to supply surplus electricity from the system and electricity provisioned by the JFE Group to 17 sites across eight companies in the House Foods Group nationwide. The service is expected to reduce CO_2 emissions by approximately 12% and energy consumption by approximately 17% (compared to FY2020) at these sites. Operation is scheduled to commence in April 2024.

CCUS

Contract received for the construction of CO_2 liquefaction, storage and loading/unloading facilities, a large-scale, long-distance, lower cost transportation system for liquid CO_2 to realize a CCUS society.

JFE Engineering has received an order from Japan CCS Co., Ltd. to construct its CO_2 liquefaction, storage, and loading/unloading facilities (EPC project). The project will construct part of the facilities to be used in the NEDO project Research, Development and Demonstration of CCUS Technology / Large-scale CCUS demonstration testing at Tomakomai / Demonstration testing on CO_2 Transportation. We will be involved in the design and construction of onshore facilities capable of liquefying and storing 10,000 tonnes per year of CO_2 separated and recovered from coal combustion gas supplied by the Maizuru plant of Kansai Electric Power Co.

PET Bottle Recycling (Bottle-to-Bottle)

Kyoei J&T Recycling Corporation's West Japan PET Bottle MR Center to start full commercial operation.

Kyoei J&T Recycling, a subsidiary of JFE Engineering, after starting the operations of the flake manufacturing plant in October 2021, has completed the construction of the pellet production line and started full commercial operation at the PET bottle recycling raw material manufacturing plant (West Japan PET Bottle MR center) in Tsu, Mie Prefecture. With an annual processing capacity of 60,000 tonnes (approximately 10 million bottles per day), the plant can recycle approximately 10% of the total number of PET bottles shipped nationwide.

By producing flakes and pellets from used PET bottles and supplying them to bottle manufacturers, we contribute to the production of plastic bottles using 100% recycled materials, which generates 63% less CO_2 than the production of crude oil-derived pellets.

Electrical Steel Sheets

Electrical steel sheets are widely used as core materials for electrical equipment such as motors and transformers and therefore play an important role in determining the performance of this electrical equipment. JFE Steel is contributing to reducing CO_2 emissions on a global scale by supplying high-performance electrical steel sheets.

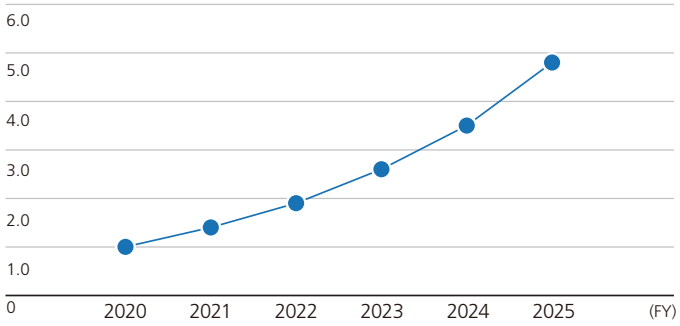
Non-Oriented Electrical Steel Sheets

In order to achieve carbon neutrality for society as a whole, a major shift is required in the social structure, from a society that relies on fossil fuels for energy to one that primarily uses carbon-free energy sources. Transitioning to a future society in which electric vehicles (EVs) are the main mobility platform and where zero-emission electricity is the main energy source will depend on highly efficient motors, for which the key materials are high-performance, non-oriented electrical steel sheets.

Our high-grade non-oriented electrical steel sheets improve the performance of EV motors. Their excellent low iron loss property contributes to higher efficiency, while their high magnetic flux density supports downsizing. These characteristics are highly regarded, and many automobile manufacturers use them in products. Demand for such high-grade non-oriented electrical steel sheets is expected to grow rapidly, and to meet this demand, we are investing approximately 49 billion yen at the West Japan Works (Kurashiki district) to double its production capacity in the first half of FY2024.

Furthermore, as the shift toward EVs accelerates, we expect the demand for high-grade non-oriented electrical steel sheets to grow even more rapidly. We have therefore decided to further strengthen the production capacity high-grade non-oriented electrical steel sheets at the West Japan Works (Kurashiki district). Furthermore, we plan to make an additional investment of approximately 46 billion yen to triple the manufacturing capacity of high-grade non-oriented electrical steel sheets for EV main motors by the end of FY2026 (including the effect of the investment already made).

■ Demand for Non-Oriented Electrical Steel Sheets (Calculated by JFE, 2020 results = 1.0)



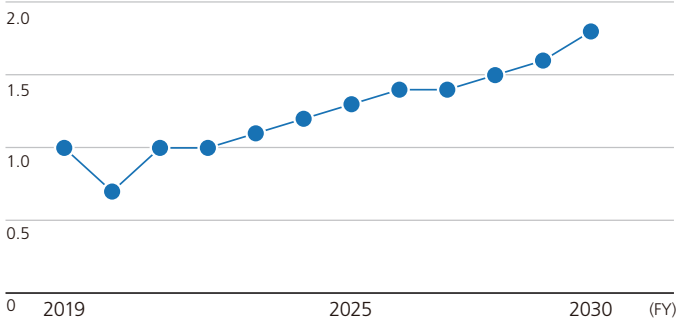
Grain-Oriented Electrical Steel Sheets

The global demand for grain-oriented electrical steel sheets in transformers is expected to increase due to continuously growing demand for electric power and the expanding adoption of renewable energy. The demand for grain-oriented electrical steel sheets, particularly in India, is expected to increase by 1.8 times in 2030, compared to 2019.

To this end, in August 2023, JFE Steel and JSW Steel Limited (JSW) signed an agreement to establish a grain-oriented electrical steel sheet manufacturing joint venture company, JSW JFE Electrical Steel Private Limited. We will work with JSW to establish an integrated manufacturing system for this type of steel sheet in India. By locally manufacturing a full line-up of mainly high-grade, energy-efficient grain-oriented electrical steel sheets, in which JFE Steel has accumulated expertise over many years, the joint venture will contribute to the development of a greener power transmission and distribution infrastructure in India and to the remarkable growth of the Indian economy.

The total investment between the two companies is planned to be 670 million dollars, and we plan to begin full production in FY2027.

■ Demand for Grain-Oriented Electrical Steel Sheets in India (Calculated by JFE, 2019 results = 1.0)



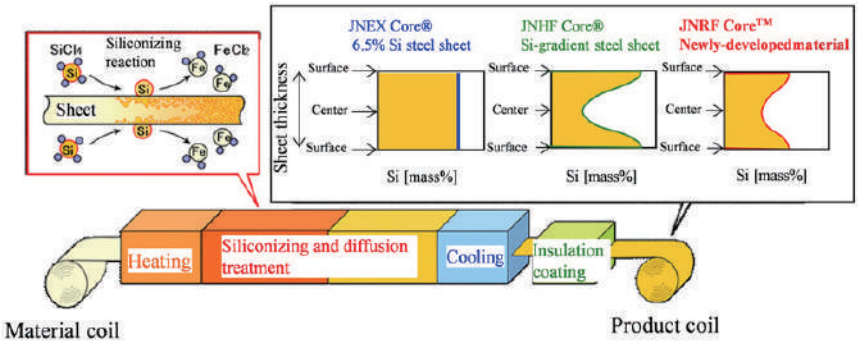
Signed an agreement to establish a grain-oriented electrical steel sheet manufacturing joint venture company

Super Core

Motors are becoming ever smaller and faster for EVs, home appliances, drones, and other applications, and consequently require higher output and efficiency. At the same time, demand is growing to reduce high-frequency iron loss*1 and increase magnetic flux density*2 for the electrical steel sheets used as iron core materials for these products. Since silicon boosts the electrical resistance of steel, increasing the amount of silicon helps to realize these properties. Using our proprietary technology for CVD continuous siliconizing*3, we worked on controlling silicon concentration distribution in the through-thickness direction by optimizing the siliconizing amount and diffusion conditions and controlling crystal orientation. These efforts have resulted in the development of a JNRF™ silicon-gradient steel sheet for high-speed motors, and JNRF™ helps to significantly increase motor efficiency to conserve energy while maintaining magnetic flux density (torque) equivalent to conventional non-oriented electrical steel sheets (3% silicon steel sheets).

*1 Iron loss refers to energy, mainly heat, lost when an iron core is excited by an alternating current. The energy loss that occurs when the iron core is excited at high frequency is called a high-frequency iron loss. The efficiency of high-speed motors increases as high-frequency iron loss is reduced.
*2 Magnetic flux density, which indicates a material's ease of magnetization, raises electromagnetic strength as density increases. In motors, larger torque (power) can be achieved with materials that offer high magnetic flux density.
*3 The chemical vapor deposition (CVD) process technology increases silicon concentration in steel. CVD, performed in a steel strip annealing line, causes a reaction between steel strips and silicon tetrachloride (SiCl4) gas in a furnace while continuously passing the steel strips through the furnace.

■ **Super Core Manufacturing Process**



High Tensile Strength Steel Sheets (HITEN) for Automobiles

Higher strength steel sheets are needed for automobile bodies in order to improve fuel efficiency, vehicle safety and, more recently, the cruising range of EVs. Generally, increasing the strength of steel sheets decreases their formability and, in some cases, limits how they can be applied. JFE Steel offers the JEFORMA® series, a lineup of cold-rolled and galvannealed steel sheets in strength grades 590, 780, 980, and 1,180 MPa, each with distinct formability characteristics. The series facilitates selection of the optimal steel sheet based on body part shape and forming method. More recently, the Company has also worked on the following development initiatives for high tensile strength steel sheets for automobiles.

Joint Development with thyssenkrupp Steel Europe

JFE Steel and thyssenkrupp Steel Europe jointly launched new 980-1,180 MPa-class cold-forming, high-tensile steel sheets by designing a new steel composition and microstructure with an emphasis on local ductility and establishing a new heat treatment method. Compared to conventional high-tensile steel sheets, these products achieve higher yield strength and ductility with excellent local ductility, characteristics that will contribute to lighter-weight automobile body frames and better crash safety performance. In addition, they can be formed into parts with complicated shapes, using conventional cold forming rather than hot stamping, and thereby helping to improve productivity, lower manufacturing cost, and save energy during parts manufacturing.

1.5 GPa-Grade High Tensile Strength Cold-Rolled Steel Sheets

In 2020, JFE Steel's 1.5 GPa-grade high tensile strength cold-rolled steel sheets were adopted for the first time in the world* for cold press forming applications in vehicle body structural parts, representing the highest strength vehicle body structural parts obtained through cold press forming. Until then, the adoption of high tensile strength cold-rolled steel sheets for complex-shaped vehicle body structural parts had been limited to 1.3 GPa grade because increasing sheet strength can result in decreased cold press formability and delayed fracture resistance. Consequently, 1.5 GPa-grade high tensile strength steel sheets manufactured through a hot press forming process were more commonly adopted to meet these challenges. JFE Steel achieved both high yield strength and delayed fracture resistance even with the 1.5 GPa-grade high tensile strength steel sheets while maintaining cold press formability equivalent to 1.3 GPa-grade sheets by using a proprietary WQ (water quenching) method-based continuous annealing process to control the steel sheet's microstructure. This enabled the adoption of 1.5 GPa-grade high tensile strength steel sheets for vehicle body structural parts through a cold forming method, thus reducing environmental impact and cost.

In addition, we received the Minister of Economy, Trade and Industry Award in the FY2023 National Invention Awards, for inventing ultra-high tensile strength thin steel sheet that improves fuel efficiency and collision safety of automobiles. This invention relates to cold-rolled steel sheets for automobiles with ultra-high tensile strength of over 1,320 MPa and dramatically improved delayed fracture resistance. It is therefore used in the ultra-high tensile strength cold-rolled steel sheets described above.

*According to our research

JFE Steel develops and manufactures steel sheet products that are easy to use, with full consideration for environmental impact and contribution to reducing energy and resources. The company will contribute to reducing CO_2 emissions in society in general through the use of its products for automobile parts.

■ Related Products and Technologies

Expand contributions to CO_2 emissions reduction in society		
Contribution to CO_2 Reduction through the Engineering Business	Large-scale biomass power generation	Started Construction Work for the Tahara Biomass Power Plant, One of the Largest Woody Biomass Combustion Power Plants in Japan, with an Output of 112,000 kW (Japanese only) (https://www.jfe-eng.co.jp/news/2022/20220601.html)
	New regional electricity	Regional Electricity Retail Businesses in Partnership with the Local Municipal Governments Establishing New Regional Electricity Businesses (FY2022 CSR, P. 116) (https://www.jfe-holdings.co.jp/en/csr/pdf/csr2022e.pdf)
	Multisite energy total service	House Foods Group Has Agreed to Adopt Multisite Energy Total Service at 17 Sites across 8 Group Companies: Driving CO_2 Reduction (Japanese only) (https://www.jfe-eng.co.jp/news/2022/20220926.html)
	Food waste recycling	Food Waste Recycling Business (FY2022 CSR, P. 115) (https://www.jfe-holdings.co.jp/en/csr/pdf/csr2022e.pdf)
		Construction of a New Food Waste Recycling Biogas Power Generation Plant in Fukuoka, Fukuoka Prefecture: J&T Recycling's First Establishment of Food Recycling Business in Kyushu (Japanese only) (https://www.jfe-eng.co.jp/news/2022/20220401.html)

Expand contributions to CO_2 emissions reduction in society		
Contribution to CO_2 reduction through the engineering business	Carbon-neutral world	Contribution to Creating a Carbon-Neutral World Through the Transport of Hydrogen and CO_2 (FY2022 CSR, P. 114) (https://www.jfe-holdings.co.jp/en/csr/pdf/csr2022e.pdf)
		Contract Received for the Construction of CO_2 Liquefaction, Storage and Loading/Unloading Facilities—a Large-Scale, Long-Distance, Lower Cost Transportation System for Liquid CO_2 to Realize a CCUS Society (Japanese only) (https://www.jfe-eng.co.jp/news/2023/20230111.html)
	PET bottle recycling	Kyoei J&T Recycling Corporation's West Japan PET Bottle MR Center to Start Full Commercial Operation (Japanese only) (https://www.jfe-eng.co.jp/news/2022/20220421.html)
Electrical steel sheets	JNRF™	JFE Steel Develops JNRF™ Silicon-Gradient Steel Sheet for High-Speed Motors—Minimizes High-Frequency Iron Loss And Improves High Magnetic Flux Density (https://www.jfe-steel.co.jp/en/release/2020/201203.html)
	Facility expansion	JFE Steel to Expand Electrical Steel Sheet Production Capacity at Kurashiki Facility (https://www.jfe-steel.co.jp/en/release/2021/210401.html)
		JFE Steel Formally Decides to Further Expand Electrical Steel Sheet Capacity of the Kurashiki facility (https://www.jfe-steel.co.jp/en/release/2023/230522-1.html)
	Supply chain for electrical steel sheets	JFE Steel & JSW Steel Proposes Grain-Oriented Steel Sheet Manufacturing JV in India (https://www.jfe-steel.co.jp/en/release/2021/210507.html)
		About the Basic Agreement to Establish a Joint Venture Company in India to Manufacture Grain-Oriented Electrical Steel with JSW Steel Limited (https://www.jfe-steel.co.jp/en/release/2023/230522-2.html)
		About the Joint Venture Agreement to Establish a Joint Venture Company in India to Manufacture Grain-Oriented Electrical Steel with JSW Steel Limited (https://www.jfe-steel.co.jp/en/release/2023/230803-2.html)
		Establish a Global Supply Chain in Electrical Steel Sheet Business (https://www.jfe-holdings.co.jp/en/sustainability/environment/product/#pro_global_supply)
High Tensile Strength Steel Sheets (HITEN) for automobiles	Development of high tensile strength steel sheets for automobiles	JFE Steel and thyssenkrupp Steel Europe Launch High-tensile Steel Sheets Capable of Cold Forming for Use in Automobile Frames (https://www.jfe-steel.co.jp/en/release/2022/220404.html)
		JFE Steel 1.5 GPa-Grade High-Tensile Strength Cold-Rolled Steel Sheets Adopted for First Time in Vehicle Body Structural Parts (https://www.jfe-steel.co.jp/en/release/2020/201223.html)

Accelerate Group-Wide Commercialization of the Offshore Wind-Power Business

Offshore wind power generation is a key initiative of the Japanese government's Green Growth Strategy to achieve carbon neutrality by 2050. We will participate in this effort by leveraging the Group's collective strength with our engineering business acting as the main driver. Specifically, the Group will work on commercializing the manufacturing and O&M* of foundation structures (monopiles, jackets) in addition to establishing a supply chain encompassing material procurement, manufacturing, and O&M. We anticipate this will significantly contribute to the JFE Group's efforts to achieve carbon neutrality as well as the government's strategy to achieve carbon neutrality.

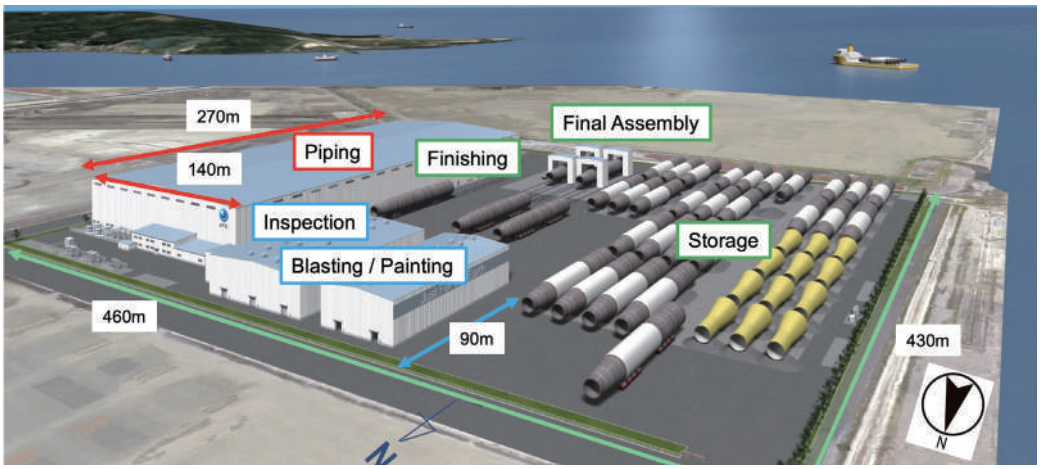
*Operation and maintenance

Construction of a Monopile Manufacturing Plant

JFE Engineering is constructing a manufacturing plant for monopiles, which are the foundational structural components for offshore wind power generation, in Kasaoka, Okayama Prefecture. Monopiles are extremely large steel structures, approximately 10 m in diameter, 100 mm thick, and 100 m long. When completed, the plant will be the only one in Japan capable of manufacturing such large structures. It is designed for production efficiency, implementing manufacturing processes based on the experiences gained in the manufacturing of large steel structures at the Tsu Works. The plant site includes extensive grounds and a quay from which manufactured structures can be directly shipped, as well as state-of-the-art equipment such as large-diameter bending machines and welding machines for extra-thick plates. Production is scheduled to start in April 2024, with an annual capacity of up to 100,000 tonnes, and is expected to significantly contribute to the establishment of a domestic supply chain in the offshore wind power generation business and to the realization of carbon neutrality.

■ Overview of New Monopile Manufacturing Plant (Kasaoka)

Construction site	Kasaoka City, Okayama Prefecture (JFE Steel West Japan Works Fukuyama area)	Investment amount	Approximately 40 billion yen* (plant building, mechanical equipment, quay reinforcement) *Includes the facility reinforcement cost of the Tsu Works.
Construction start	June 2022	Site area	Approximately 20 ha (includes storage area)
Operation start	April 2024	Production capacity	Approximately 80,000–100,000 tonnes per year (Approx. 50 sets)
Length of shipping quay	200 m (quay total length: 400 m)	Quay depth	–11 m



Construction work of the monopile manufacturing plant, as of May 2023

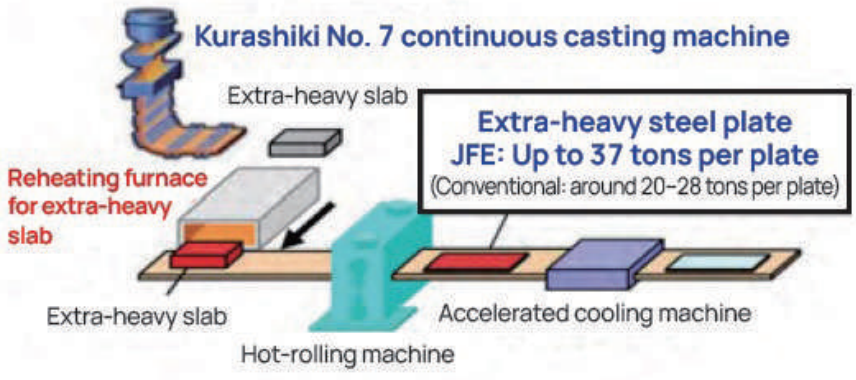
Large and Heavy Steel Plates for Offshore Wind Power Generation

The large and heavy steel plate J-TerraPlate™, produced with the No. 7 continuous caster of the Kurashiki Plant at the JFE Steel's West Japan Works, has been selected for the first time for the production of monopile foundations for offshore wind power generation.

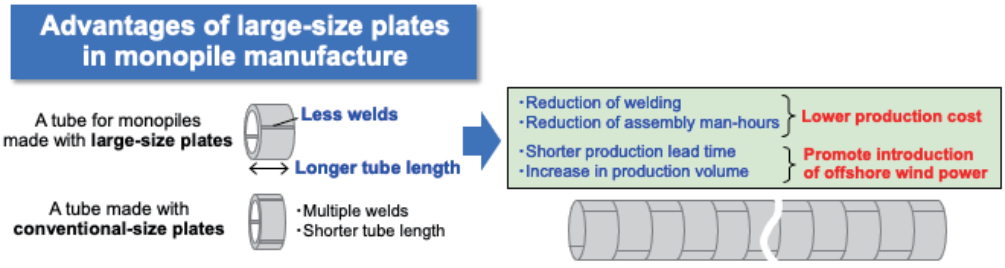
Offshore wind turbines have recently grown in size, requiring larger monopiles and other foundational structures to support them. The monopiles are manufactured by welding ultra-thick steel plates, resulting in increased welding workloads that require monopile manufacturers to improve the efficiency of the operations. Using larger and heavier steel plates makes it possible to reduce the volume of welding operations, compared to conventional small-size plates, and also helps to raise process efficiency while lower manufacturing costs.

We have been investing in equipment at the plate mills and other facilities to manufacture and supply steel plates of up to 37 tonnes (previously limited to around 20 to 28 tonnes per plate in general), the largest in Asia and capable of supporting wind turbines in harsh offshore environments over the long term and in large quantities using the extra-large slabs produced with the state-of-the-art No. 7 continuous casting machine. These investments have resulted in the first-time adoption of this product for the production of monopile foundations.

■ Manufacturing Process of Large and Heavy Steel Plates for Offshore Wind Power Generation



■ Advantages of Using Large and Heavy Steel Plates for Monopiles



■ Commercialization of Offshore Wind-Power Business

- By commercializing our manufacturing of foundation structures (monopiles), we will become the forerunner in the business of offshore wind-power generation and establish a supply chain across the entire Group, including foundation manufacturing and O&M.*1
- We will strive to expand business in the field of renewable energy by leveraging the JFE Group's collective strengths (synergies), with JFE Engineering as the main player.

JFE Engineering

Manufacture seabed-fixed foundation structures*2 for offshore wind power generation
(Started factory operation in April 2024)

JFE Steel

Increased production capacity and stable mass production of large and heavy plates for offshore wind power generation

Utilization of Kurashiki No. 7 Continuous Casting Machine in Kurashiki district (started operation in June 2021)

Steel supply

SCM support
Steel supply

SCM support

Steel supply

JFE Shoji

SCM construction for steel products and processed products for offshore wind power generation contributes to Group collaboration

Each company under the Group

JMU*3: fabrication of offshore wind turbine floats and construction of work vessels

Group-wide: O&M with maximum use of resource

*1 Operation and maintenance. Apply expertise of maintenance and analysis technologies.
*2 Seabed-fixed foundation structures: monopiles, jackets, etc.
*3 Japan Marin United Corporation (equity method affiliate)

■ Technologies of Group Companies

Category	Company	Details
Foundation structures	JFE Engineering	Seabed foundations (monopiles, jackets, etc.)
	Japan Marine United	Floating foundations (semi-submersible)
	JFE Steel	High-quality, large and heavy steel plates, high-strength steel (reduced using HBL series steel plates)
Construction	Japan Marine United	SEP vessels (self-elevating platform)
	JFE Engineering	JFE-RAPID (cable laying method)
		Battery systems for power storage
	GECOSS	Stands for large steel structures
	JFE Steel	Natural stone substitute materials (use of steel slags)
O&M (operation and maintenance)	JFE Engineering	Technologies for remote monitoring and operation
	JFE Advantech	Vibration measurement equipment and systems, sea monitoring tools (water quality, sea conditions)
	Japan Marine United	Offshore support vessels (work vessels)
	JFE Plant Engineering	Wind turbine maintenance (diagnosis and repair)
	JFE Technos	Technologies and expertise in planning, constructing, and maintaining onshore turbines
	JFE Techno-Research	Equipment evaluation and analysis for corrosion, fatigue, vibration, etc., diagnosis of remaining service life, strength and durability testing and evaluation techniques for large structures
Supply chain	JFE Shoji	Contribution to optimizing offshore wind power generation project execution

Initiatives for Achieving Carbon Neutrality in the Keihin Waterfront Areas

The JFE Group is partnering with Kawasaki City to devise options for repurposing land in the Keihin district of the Japan East Works after the operation of blast furnaces and other facilities are suspended. One key vision for land use is to play a leading role in achieving carbon neutrality. Public-private partnerships are also underway to accelerate the government's plan to create a carbon-neutral port in the Keihin waterfront area, including the land belonging to the Japan East Works.

Since April 2022, JFE Holdings, ENEOS Corporation, and JERA Co., Inc. are conducting a joint study on establishing a hydrogen and ammonia receiving and supply base. As part of this effort, we are considering utilizing the deep-water wharves and adjacent land areas of Ogishima, an island in the Keihin district. Furthermore, in March 2023, the Kawasaki waterfront area was selected as a candidate site for receiving liquefied hydrogen for the Liquefied Hydrogen Supply Chain Commercialization Demonstration Project, a joint initiative by Japan Suiso Energy Ltd., Iwatani Corporation, and ENEOS Corporation that is part of NEDO's Green Innovation Fund Project: Large-scale Hydrogen Supply Chain Establishment. We are actively exchanging information with these companies.

The JFE Group intends to play a role in building a stable and economical supply chain for hydrogen and other decarbonized fuels, starting with Ogishima, and to contribute to realizing carbon neutrality in the Keihin waterfront area and for society as a whole.

Aerial view of the Keihin waterfront area (courtesy of Kawasaki City)

Adapting to Climate Change (Contribution to Achieving Societal Resilience)

Contributions to Disaster Prevention and Mitigation and Increased National Resilience

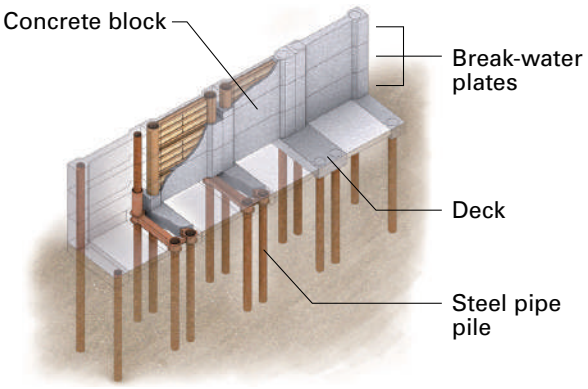
The JFE Group is not only focused on reducing CO_2 emissions (climate change mitigation); we also intend to contribute to the resilience of society in general by adapting to climate change.

With infrastructure such as hybrid tide embankments and permeable steel slit dams, the Group will contribute to preventing and mitigating disaster-related damage to infrastructure critical to daily life and economic activities, and to strengthening their resilience.

Hybrid Tide Embankments

Hybrid tide embankments are made of steel and concrete. Because of their hybrid structure, they require shorter construction time and less space.

Concrete blocks for hybrid tide embankments are precast at a JFE Group factory, while steel pipe piles for foundations are installed at the construction site, thereby reducing the time required for on-site construction by about 60%. This arrangement does not require large amounts of materials, equipment, or workers on site, so it does not interfere with other construction work. Furthermore, compared to a conventional embankment structure, the land area occupied by the embankment can be reduced by about 80%, saving considerable space. We will continue to apply and advance our technology to further contribute to disaster prevention in the region.



Cross section

Hybrid tide embankments

➤ **JFE Engineering Infrastructure Using Steel Structures (Japanese only)**
(https://www.jfe-eng.co.jp/products/bridge/co01.html)

Permeable Steel Slit Dams

A permeable steel slit dam is a steel pipe structure installed in a river to trap debris flows.

Made of strong steel pipes to withstand the impact of driftwood and huge debris, it has large openings to let water and sediment to pass through, which prevents the water level from rising upstream during floods and also ensuring that debris does not flow downstream. Since it does not block the flow of water, unlike a dam, it can be shaped to the slope of a riverbed to protect the ecosystem. The JFE Group is working to expand the use of permeable steel slit dams by reducing installation costs and shortening the construction period through structural innovations.

Permeable steel slit dams

Terre Armée Method

The Terre Armée method drove the spread of the reinforced soil technology in Japan. This reinforced soil wall construction method was introduced to Japan about half a century ago, and since then, it has been used in a variety of situations, mainly in domestic infrastructure development, such as highway and other road structures, and the construction of airports, schools, and defense facilities. By applying layers of steel reinforcement in the embankment, friction between the steel strips and the earth results in a vertically strong structure that exhibits excellent earthquake resistance.

JFE Shoji Terre One Corporation, a subsidiary of JFE Shoji, has developed a new Terre Armée method, with an innovative fail-safe system . The feature helps to visually confirm the health of structures after being subject to unforeseen forces, such as massive earthquakes. Being able to easily detect the internal anomalies of reinforced embankments helps to determine the safety of the infrastructure and schedule necessary maintenance work in a timelier manner.

We will contribute to building disaster-resistant roads and towns by promoting the Terre Armée method and by expanding sales of other products that contribute to disaster prevention, disaster mitigation, and national land resilience.

Application in highway walls for National Route No. 3, Kumamoto Prefecture)

Fail-Sensor indicator
(red indicating internal anomalies)

Risk Management (Climate Change)

JFE Holdings is responsible for comprehensive risk management in accordance with its Basic Policy for Building Internal Control Systems. The JFE Group Sustainability Council, chaired by the president of JFE Holdings, consolidates information and strengthens management across the Group to reduce the frequency and impact of risks.

The executive officer responsible for risk strives to identify potential ESG risks such as those associated with climate change. As necessary, the council confirms and evaluates risks and discusses and determines countermeasures. Key managerial issues are deliberated by the Group Management Strategy Committee.

The Board of Directors supervises initiatives on ESG risks such as those related to climate change and CSR by discussing, making decisions on, and receiving reports about these matters.

Climate-related risks are identified and evaluated based on a scenario analysis conducted under the framework recommended by the TCFD in 2017. Key factors that may affect management are selected for further analysis and incorporated into formulating business strategies, such as the Seventh Medium-term Business Plan.

Monitoring Method for Climate Change-Related Risks

Issues that may affect management are monitored by the JFE Group Sustainability Council, Group Management Strategy Committee, and Management Committee. Measures are implemented based on a quarterly report on climate change-related risks deliberated by the specialized committees of each Group company (e.g., the Environmental Committee). The JFE Group Environmental Committee consolidates information and strengthens management to reduce the frequency and impact of risks and to maximize opportunities.

Countermeasures Based on Monitoring

1. Group-wide deliberations
2. Monitoring penetration of policies within the Group
3. Monitoring deployment of policies throughout the Group

For further details, refer to the following links.

➤ System for Promoting Sustainability (P.24)
➤ Risk Management (P.220)
➤ Environmental Management (P.47)

Metrics and Targets (Medium- and Long Term Targets and Results in FY2022)

The JFE Group's steel business is led by its operating company, JFE Steel, which is a member of the Japan Iron and Steel Federation (JISF). The JFE Group is promoting the JISF's Commitment to a Low Carbon Society, which focuses on the Three Ecos initiatives and the development of innovative new iron and steelmaking processes. Under the initiative, the JISF's target for FY2030 had originally been to reduce emissions by 9 million t-CO_2. However, with the end of Phase I of this initiative in 2020, it was rebranded as the JISF's Carbon Neutrality Action Plan, and the Phase II target (FY2030 target) was revised to a 30% reduction in energy-derived CO_2 emissions in FY2030, compared to FY2013. JFE Steel is aggressively pursuing the achievement of this goal.

In addition, JISF has formulated and announced the Long-term Vision for Climate Change Mitigation in 2030 and beyond, which is intended to realize zero-carbon steel. JFE Steel played a key role in formulating this vision. Furthermore, in 2021, the JISF announced the "Basic Policy of the Japan steel industry on 2050 Carbon Neutrality sought by the Japanese government," declaring that the Japanese iron and steel industry will boldly take on the challenge of realizing zero-carbon steel.

The JFE Group intends to increase sustainability through solutions that address global climate change while restructuring to respond to developments in the environment facing our steel business. We considered 2020 to be the landmark year for further reinforcing our efforts to tackle climate change, and we declared our target to reduce CO_2 emissions in the steel business in FY2030 by 20% or more, compared to FY2013, and to achieve carbon neutrality by 2050.

In May 2021, the JFE Group placed top priority on its climate change initiatives and formulated the JFE Group Environmental Vision for 2050 as part of the Seventh Medium-term Business Plan, under which we will strive to achieve carbon neutrality by 2050. The Group also disclosed new CO_2 emissions reduction targets, and in February 2022, the FY2030 target for the steel business was revised upward to 30% or more, compared to FY2013. Major Group companies of JFE Steel have formulated CO_2 reduction targets at the same level as JFE Steel. The Group companies in Japan and overseas work together to incorporate efforts to address climate change issues into their business strategies. The Group will systematically pursue the reduction of CO_2 emissions by incorporating the TCFD's principles in its management strategies.

JFE Group's Initiatives to Reduce CO_2 (JFE Group Environmental Vision for 2050)

Seventh Medium-term Business Plan Initiatives

- Reduce steel-business CO_2 emissions in FY2024 by 18%, compared to FY2013 (JFE Steel).
  Furthermore, JFE Steel's major group companies have also set their own CO_2 reduction targets for FY2024 to ensure that these targets are achieved. With this, more than 99% of the total CO_2 emissions of the entire JFE Steel Group is accounted for.
- The target of reducing CO_2 in FY2030: 30% or more, compared to FY2013 (JFE Steel)

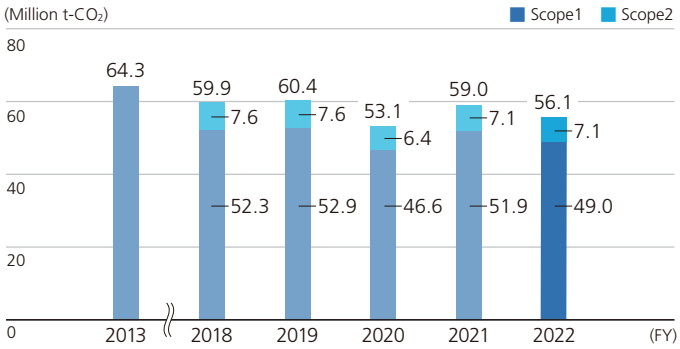
Initiatives for Carbon Neutrality by 2050

- Reduce CO_2 emissions at JFE Steel
  - · Pursue ultra-innovative technologies mainly for carbon-recycling blast furnaces and CCU
  - · Develop hydrogen-based ironmaking (direct-reduction) technology
  - · Develop electric arc furnace process technology
- Expand engineering business contributions to CO_2 emissions reduction in society
  - · Reduce CO_2 emissions by 12 million tonnes in FY2024 and 25 million tonnes in FY2030
- Offshore wind-power generation business
  - · Accelerate commercialization of our offshore wind-power business by applying the strengths of the Group

➤ JFE Group Environmental Vision for 2050, Presentation Material
(https://www.jfe-holdings.co.jp/en/investor/zaimu/g-data/2020/May2021-210525-release01.pdf)

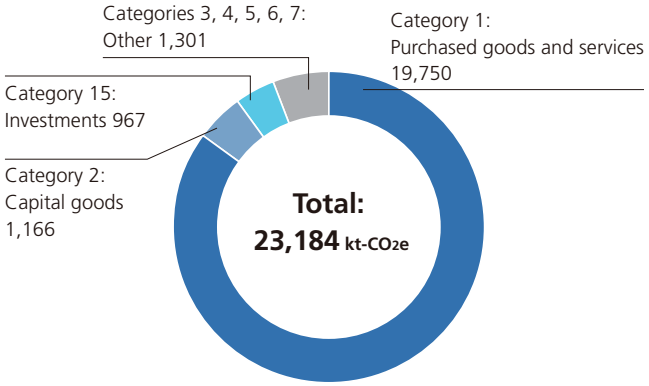
CO_2 Emissions of the JFE Group

■ CO_2 Emissions of the JFE Group



Notes:
- Data cover 76 companies
  JFE Steel and 26 major domestic and overseas subsidiaries
  JFE Engineering and 12 major domestic and overseas subsidiaries
  JFE Shoji and 35 major domestic and overseas subsidiaries
- Data for JFE Steel include CO_2 emissions from non-energy sources.
- Starting with FY2018, data for JFE Steel's subsidiaries and JFE Engineering's subsidiary include CO_2 emissions from non-energy sources.
- FY2013 figure includes data for the Sendai Works of JFE Bars & Shapes Corporation.
- Since FY2021, the figures include data for an expanded list of JFE Steel, JFE Engineering, and JFE Shoji major subsidiaries.

■ Scope 3 Emissions of the JFE Group (FY2022)



Coverage:
(Categories 1, 2, 3, 4, 5) JFE Steel, 21 JFE Steel major domestic subsidiaries, JFE Engineering, 1 JFE Engineering major subsidiary, and JFE Shoji
(Category 6, 7) JFE Steel, 21 JFE Steel major domestic subsidiaries, JFE Engineering, 15 JFE Engineering major domestic and overseas subsidiaries, and JFE Shoji
(Category 15) Japan Marine United, and 10 JFE Steel equity-method affiliates (7 domestic and 3 overseas)
Sources: Green Value Chain Platform (Ministry of the Environment) and others

For more on quantitative data related to CO_2 emissions, refer to the following information.

➤ Environmental Data (P.225)

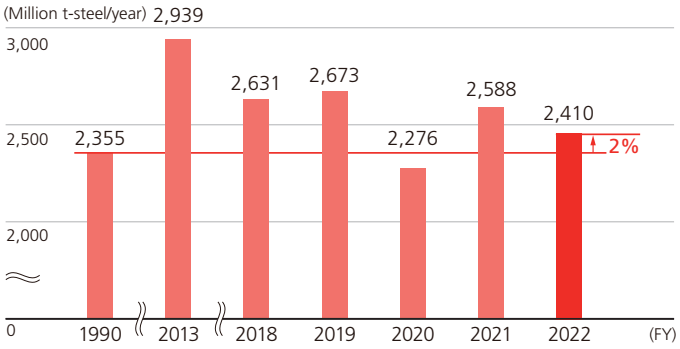
JFE Steel

Initiatives to Save Energy and Reduce CO_2

JFE Steel has always aggressively pursued CO_2 reduction and energy savings, including the introduction of energy-saving equipment.

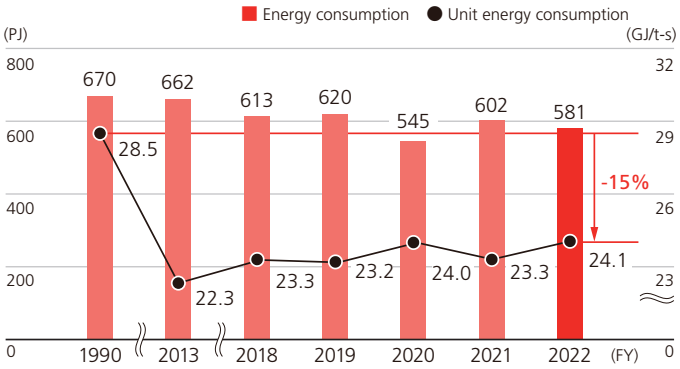
Energy Consumption and CO_2 Emissions in FY2022

Production of Crude Steel of JFE Steel



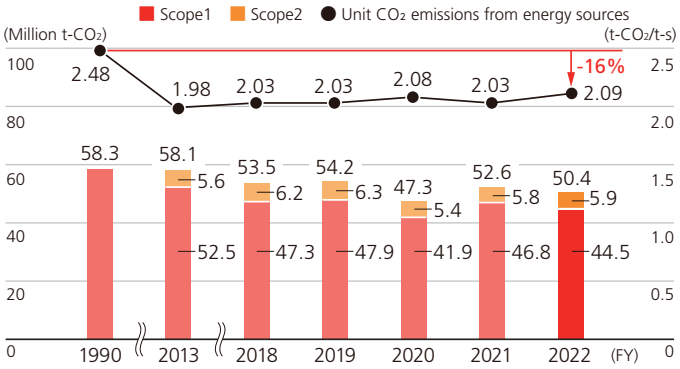
Note: FY2013 figure includes data for the Sendai Works of JFE Bars & Shapes Corporation.

Energy Consumption and Unit Energy Consumption of JFE Steel



Note: FY2013 figure includes data for the Sendai Works of JFE Bars & Shapes Corpora tion.

■ CO_2 Emissions from Energy Sources and Unit CO_2 Emissions of JFE Steel



Notes:

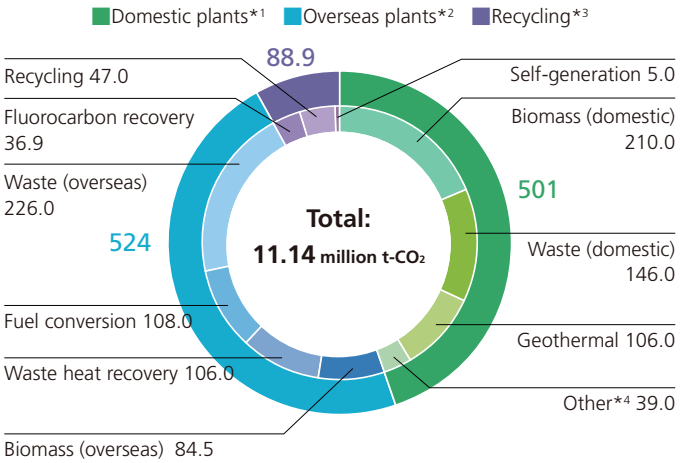
- The CO_2 emissions and emission intensity in FY2022 are calculated using the CO_2 emission factor for electricity purchased in FY2021, adopted by the Japan Iron and Steel Federation's Commitment to a Low Carbon Society.
- FY2021 data was revised by applying the CO_2 emission factor for electricity purchased in FY2021, as adopted by the Japan Iron and Steel Federation's Commitment to a Low Carbon Society.
- FY2013 figure includes data for JFE Bars & Shapes Corporation's Sendai Works.

JFE Engineering

JFE Engineering contributes to CO_2 emissions reductions in society as a whole through its business operations, such as by expanding renewable energy generation and constructing and operating plastic and food recycling plants. In FY2022, the Company contributed to reducing 11.14 million tonnes of CO_2 emissions (a 5% increase compared to FY2021) across society. JFE Engineering will further expand its business and contribute to CO_2 emissions reductions of 12 million tonnes in FY2024 and 25 million tonnes in FY2030.

In addition, since FY2021 we have been implementing such initiatives as subscribing to on-site solar power PPA and zero-emission electricity plans at the Yokohama office and a low-emission electricity plan at the Tsu Works. As a result, in FY2022 we have achieved a 50% reduction in CO_2 emissions, compared to FY2013. We have also been working on reducing waste and implementing energy-saving activities at our steelworks and in our offices. The Company will steadfastly conduct business in ways that save resources and are environmentally sound, including expanding the use of renewable energy.

■ JFE Engineering's Contribution to CO_2 Emissions Reductions (FY2022)



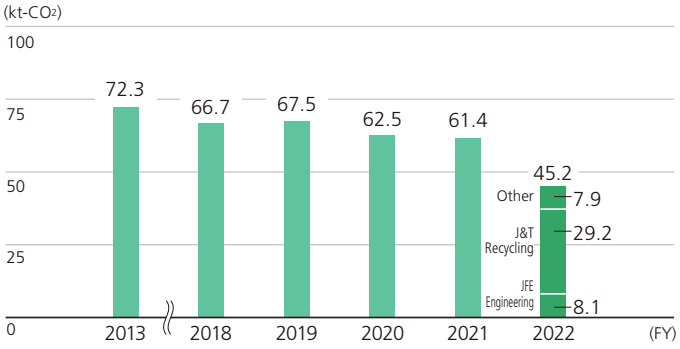
*1 Data cover JFE Engineering.

*2 Data cover JFE Engineering and Standardkessel Baumgarte GmbH (SBG), a German subsidiary of JFE Engineering Corporation.

*3 Data cover J&T Recycling Corporation and JFE Urban Recycle Corporation.

*4 Other includes solar, wind, digestion gas, sludge incineration, PPA, and energy service

■ JFE Engineering Group's CO_2 Emissions from Energy Sources



Notes:
- Data cover JFE Engineering and 13 major domestic and overseas subsidiaries.
- FY2021 figure includes data for an expanded list of JFE Engineering major subsidiaries.

JFE Shoji

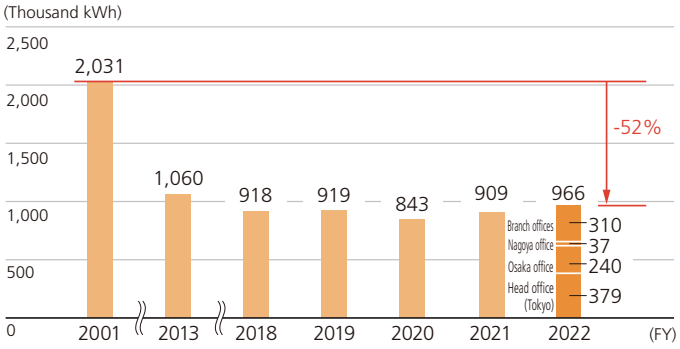
Under the environmental strategies formulated in 2001, JFE Shoji is continuously implementing initiatives to reduce paper and electricity consumption and strictly manage waste separation as part of its energy reduction efforts.

In terms of reducing paper consumption, the company continues to use recycled paper to conserve natural resources, and we also ensure that documents are printed in black and white using both sides of the paper. We are also strongly promoting paperless meetings through the use of large monitors and web conferencing systems. Consequently, the amount of paper used per employee is on a downward trend. As for electricity consumption, JFE Shoji is reducing its environmental impact by introducing motion-sensor lighting and energy-saving equipment through office renovations, implementing leave-on-time days, improving operational efficiencies through robotic process automation (RPA), and other measures.

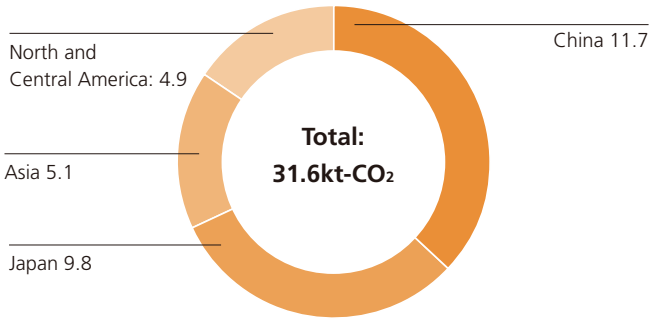
In addition, the company has established a new goal in the domestic operating companies to reduce CO_2 emissions by installing solar panels and purchasing electricity derived from renewable energy sources. In February 2023, we completed a project at JFE Shoji Coil Center Corporation in Shizuoka that achieved virtually zero CO_2 emissions in steel processing, the first time* this has been achieved in the steel distribution industry. As a result of this and other ongoing efforts to reduce the amount of electricity consumed, CO_2 emissions in FY2022 in the domestic operating companies were reduced by 11.2%, compared to FY2019.

*According to our research

■ Electric Power Consumption by JFE Shoji



■ CO_2 Emissions of the JFE Shoji Group (FY2022)



Notes:Data cover CO_2 emissions from electricity use by JFE Shoji and 35 major domestic and overseas subsidiaries (steel-processing companies).

Endorsing and Participating in External Initiatives

The JFE Group expresses its views and opinions on various public policies and external initiatives related to climate change and environmental conservation through Keidanren (Japan Business Federation) and the Japan Iron and Steel Federation (JISF), and it proactively participates in these activities.

The Group also endorses the Challenge Zero declaration and will rise to the challenge in pursuit of innovation. Challenge Zero (Innovation Challenges Towards a Net Zero Carbon Society) is a new joint initiative by Keidanren and the Japanese government for proactively publicizing and supporting companies and organizations that pursue innovative actions to realize a decarbonized society, which is the long-term goal of the Paris Agreement.

The Japan Iron and Steel Federation (JISF) is actively working toward achieving its Carbon Neutrality Action Plan (formerly the Commitment to a Low Carbon Society), with the target year of FY2030. In November 2018, the JISF also formulated and published the Long-term Vision for Climate Change Mitigation for 2030 and beyond, which represents the industry's challenge for realizing zero-carbon steel. In February 2021, the JISF announced the "Basic Policy of the Japan steel industry on 2050 Carbon Neutrality aimed by the Japanese government," declaring that the Japanese iron and steel industry will boldly take on the challenge of realizing zero-carbon steel. As a member of the JISF, JFE Steel will be an active participant in these medium- and long-term climate change initiatives.In addition, the Ministry of Economy, Trade, and Industry (METI) has announced its intention to establish the GX League, a forum that invites companies to work on GX; take up the challenge of GX in cooperation with the government, academic, and economic sectors; discuss how to transform the overall economic and social system; and drive the creation of new markets. The Group participates in the GX League because it believes that its goal is aligned with the JFE Group's overall objective for climate change initiatives. JFE Steel is also participating in activities outside of Japan such as the Japan India Public and Private Collaborative Meeting, Japan-ASEAN Steel Initiative, and Japan-China Steel Industries Exchange. Furthermore, it is a member of the World Steel Association (WSA)'s Climate Action data collection program, which uses ISO 14404 as the standard for measurement and calculation.

JFE Engineering is a member of the Japan Climate Leaders' Partnership (JCLP). Established in 2009, the JCLP is a coalition of Japanese corporations that encourage the industrial community to fully recognize the urgency of climate change and take more decisive action to create a sustainable, decarbonized society. Companies fulfill their corporate responsibility by demonstrating leadership in the transition to a decarbonized society. The Company is participating in the Decarbonization Consortium, JCLP's platform for encouraging information sharing and collaboration between companies and is actively engaged in creating opportunities to learn from companies at the frontline of decarbonization efforts, and collaborating with other companies to create new solutions. Furthermore, with the GX League, established and promoted by METI, becoming fully operational in April 2023, JFE Engineering has decided to officially participate in the league starting in FY2023. Through the league, we will promote co-creation with various stakeholders and contribute to the realization of carbon neutrality and the transformation of economic and social systems.

In 2021, JFE Shoji became a signatory to the United Nations Global Compact, affirming its support for these principles. JFE Shoji will comply with the Ten Principles of the Global Compact and endeavor to achieve the SDGs. In addition, we are also

a member of the Global Compact Network Japan, the local network of the Global Compact. In FY2022, we participated in subcommittees on supply chains, human rights due diligence, human rights education, and other topics, learning about global trends and exchanging information between companies for connecting to our own SDG promotion efforts.

For more details, refer to the following.

➤ **Steel Industry Initiatives** (P.104)

Initiatives by industry groups

- **The Japan Iron and Steel Federation: Climate Change Policy** (https://www.jisf.or.jp/en/activity/climate/index.html)
- **The Japan Iron and Steel Federation: Challenges towards Carbon Neutrality** (https://www.carbon-neutral-steel.com/en/)
- **Keidanren (Japan Business Federation): Challenge Zero** (https://www.challenge-zero.jp/en/)
- **The Ministry of Economy, Trade, and Industry: GX League (Japanese only)** (https://gx-league.go.jp/)
- **WSA: Climate Action data collection programme** (https://worldsteel.org/climate-action/climate-action-data-collection/data-providers/)
- **Japan Climate Leaders' Partnership (JCLP)** (https://japan-clp.jp/en)
- **United Nations Global Compact** (https://www.unglobalcompact.org/)
- **Global Compact Network Japan (Japanese only)** (https://www.ungcjn.org/)

Scenario Analysis in Line with the TCFD Recommendations

Initiatives

The JFE Group intends to achieve carbon neutrality by 2050, and it leverages the scenario analysis in line with the TCFD recommendations **to identify and assess climate change-related risks and opportunities and to strengthen the resilience of its organizational strategy.** Please refer to the "Climate Change" page for governance, strategy, risk management, metrics, and targets for climate change-related issues in line with the TCFD recommendations.

➤ Climate Change (P.53)

Milestones Related to Climate Change around JFE's Business and JFE's Initiatives

1997 Kyoto Protocol adopted at COP3 in Kyoto
2008 JISF's Voluntary Action Plan launched
2013 JISF's Commitment to a Low Carbon Society launched
2015 Paris Agreement adopted at COP21
2017 TCFD published the final report of its recommendations
2018 JISF announced the Long-term Vision for Climate Change Mitigation, Zero Carbon Steel
2019 **JFE Group announced its endorsement for the final report of the TCFD recommendations**
JFE Group published a scenario analysis in line with the TCFD recommendations
2020 Keidanren launched the Challenge Zero initiative
Ministry of Economy, Trade and Industry published a list entitled Companies Taking on the Zero-Emission Challenge
JFE Group published its targets in its medium- to long-term vision (target for 2030 and achieving carbon neutrality by 2050)
Prime Minister Suga declared Japan will achieve carbon neutrality by 2050
2021 JISF announced the Basic Policy of the Japan Steel Industry on 2050 Carbon Neutrality Aimed by the Japanese Government
JFE Group published its roadmap for achieving carbon neutrality in 2050 in the JFE Group Environmental Vision for 2050
Japanese government formulated the Green Growth Strategy Through Achieving Carbon Neutrality in 2050
2022 **JFE Group announced that the CO_2 emissions reduction target for FY2030 for JFE Steel has been revised upward to 30% or more compared to FY2013**
JISF published the "Evaluation of the Phase I Target (FY2020 Target)" and Phase II (FY2030 target) of reducing the total volume of energy-related CO_2 emissions by 30% in its "Activities to Combat Global Warming—Report of JISF's Carbon Neutrality Action Plan (Commitment to a Low Carbon Society) (March 2022)."
2023 The Act Concerning the Promotion of a Smooth Transition to a Decarbonized Economic Structure (the "GX Promotion Act") was enacted.

The Challenge Zero (Innovation Challenges Toward a Net Zero Carbon Society) is a new joint initiative by Keidanren (Japan Business Federation) and the Japanese government for proactively publicizing and supporting companies and organizations that pursue innovative actions toward realizing a decarbonized society as the long-term goal of the Paris Agreement.
The JFE Group endorses the Challenge Zero declaration and will rise to the challenge of pursuing innovation.
The Ministry of Economy, Trade and Industry (METI), in collaboration with Keidanren and the New Energy and Industrial Technology Development Organization (NEDO), has been tackling a project called the Zero-Emission Challenge. The project is preparing a list of companies generating innovation toward realizing a decarbonized society and providing investors and other stakeholders with useful information on them. At the TCFD Summit 2021 on October 5, 2021, approximately 600 companies, both listed and unlisted, were announced as Zero Emissions Challenge Companies. These organizations are boldly accepting the challenge of innovation to realize a decarbonized society, and the JFE Group was selected as one of them.

The JFE Group publishes information on specific initiatives through the following website.

➤ **Challenge Zero** (https://www.challenge-zero.jp/en/member/34)

➤ **Zero-Emission Challenge** (https://www.meti.go.jp/english/press/2021/1005_002.html)

Scenario Analysis

Tools and Methods

Scenario analysis is used to portray an accurate understanding of climate-related risks and opportunities and assess implications to the current business strategy, thereby enabling an organization to establish strategies that reflect the results of the assessment. As our business could be significantly affected by climate change, we have created both a 2°C scenario and a 4°C scenario. In FY2022, we expanded the scope to also include a 1.5°C scenario.

All three scenarios are based on those developed by the International Energy Agency (IEA). Analysis was conducted under the assumption that uniform carbon pricing is implemented by major emitting countries to increase the feasibility of achieving the 1.5°C target. Under the long-term scenario analysis, our goal is to achieve carbon neutrality by 2050. We conducted risk assessments that take into account the prospect of achieving the 2°C scenario and the necessity of ultra-innovative technology for the 1.5°C scenario (IPCC 1.5°C Special Report) in steelmaking for carbon neutrality by 2050.

<table>
<tr><th colspan="2">Selected Scenario</th><th>1.5/2°C Scenario</th><th>4°C Scenario</th></tr>
<tr><td rowspan="2">Reference Scenario</td><td>Transition Risks</td><td>Transition scenarios developed by the IEA
· Sustainable Development Scenario (SDS)*1
· 2°C Scenario (2DS)*2
· IPCC Special Report on Global Warming of 1.5°C
· NZE2050*3</td><td>Transition scenarios developed by the IEA
· New Policies Scenario (NPS)*1
· Reference Technology Scenario (RTS)*2</td></tr>
<tr><td>Physical Risk</td><td colspan="2">Climate change projection scenario developed by the Intergovernmental Panel on Climate Change (IPCC)
· Representative Concentration Pathways (RCP) Scenario*4</td></tr>
<tr><td colspan="2">How Society will Look</td><td>Dynamic policies will be adopted and technical innovations will progress to limit the average temperature rise by the end of this century to 2°C and realize sustainable development.
Assume a society in which our business is affected by social changes accompanying transition to a decarbonized society.
· Worldwide/industry-wide uniform carbon pricing*5
· Increase in the ratio of sales of electric vehicles to overall vehicle sales</td><td>Despite new policies implemented in each country based on approaches under the Paris Agreement, the average temperature will rise by about 4°C by the end of this century.
Assume a society in which our business is affected by temperature rise and other climate change.
· Increase in the occurrence of flooding
· Sea level rise</td></tr>
</table>

*1 Source: IEA's World Energy Outlook 2018

*2 Source: IEA's Energy Technology Perspectives 2017

*3 Source: IEA's Net Zero by 2050—A Roadmap for the Global Energy Sector

*4 Source: IPCC Fifth Assessment Report

*5 When carbon pricing differs from country to country, a gap opens in international competitiveness between countries that impose strict CO_2 emissions regulations and those with less strict regulations. This will result in carbon leakage where CO_2 emissions of a strict climate policy country are reduced as production and investment decline while production and investment increase in other countries with laxer emission constraints, thereby increasing their nations' CO_2 emissions. One reference scenario, SDS, assumes the implementation of carbon pricing in developed countries and some developing countries. We took this into account in formulating the 2°C scenario based on the assumption that uniform carbon pricing is introduced to major emitting countries to push toward achieving the 2°C scenario target.

Scope of Business and Period for Analysis

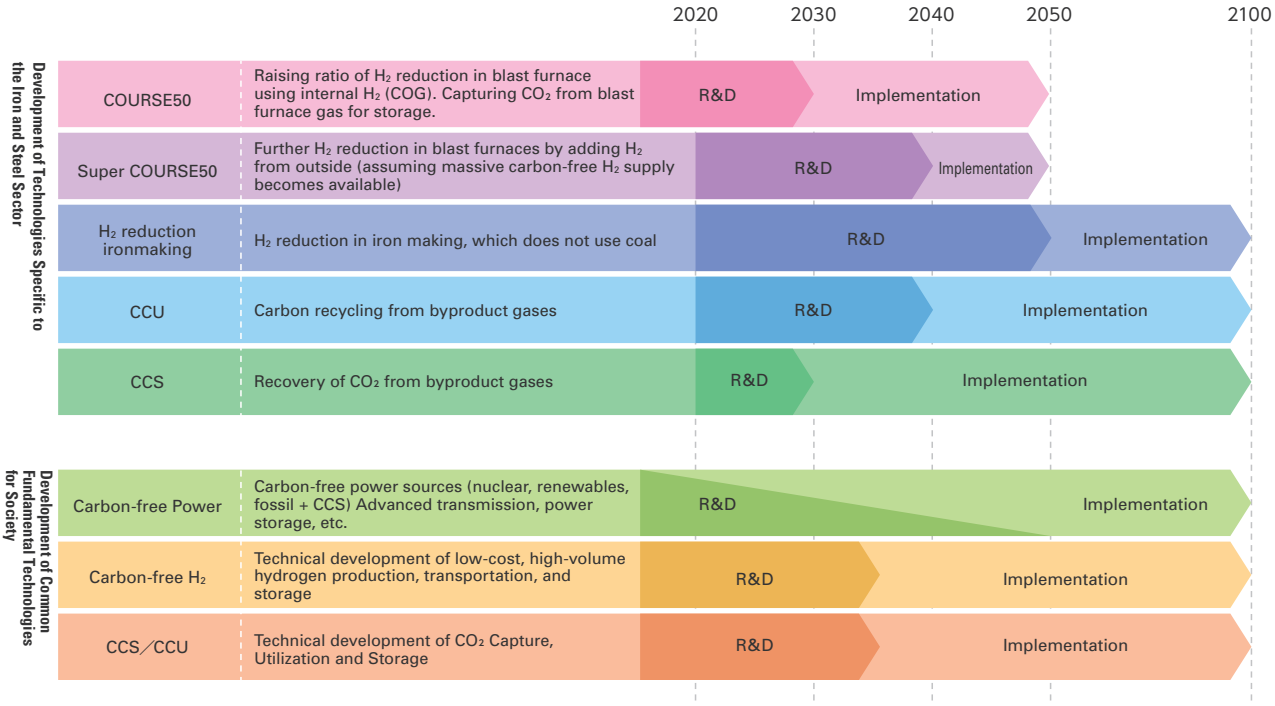
This analysis covers the following businesses: the steel business by JFE Steel, the engineering business by JFE Engineering, the trading business by JFE Shoji, and businesses carried out by some of the other Group companies. The period covered is up to 2050.

Relevance with the JISF's Long-term Vision for Climate Change Mitigation

The Japan Iron and Steel Federation (JISF) has been working toward its Commitment to a Low Carbon Society, and Phase I of this initiative ended in FY2020. From FY2021, the effort was rebranded as the Carbon Neutrality Action Plan, and the Phase II target (FY2030 target) was revised. In November 2018, the JISF also formulated and published the Long-term Vision for Climate Change Mitigation for 2030 and beyond. JFE Steel played a central role in the formulation of this long-term vision. The vision represents the industry's challenge toward realizing zero-carbon steel and lays out the prospect of achieving the 2°C scenario for steelmaking and necessity of ultra-innovative technologies to achieve the 1.5°C scenario. Furthermore, on February 15, 2021, the JISF announced the "Basic Policy of the Japan Steel Industry on 2050 Carbon Neutrality Aimed by the Japanese Government," which declares that the Japanese iron and steel industry will boldly accept the challenge of realizing zero-carbon steel.

The JFE Group's scenario analysis is intended to ensure resiliency in our Group's business strategy during the intermediate stages of these long-term challenges.

■ Efforts to Achieve Zero Carbon Steel



➤ JIFS: Challenges towards Carbon Neutrality (https://www.carbon-neutral-steel.com/en/)

Process to Identify Key Factors that Impact the Business

STEP 1: Examine the entire value chain from a holistic perspective and sort out factors that impact the businesses under analysis (for more information on risks and opportunities in the value chain, refer to:
➤ JFE Group Value Chain (P. 30)

STEP 2: Examine all factors at an overview level and identify key factors by taking into account the level of impact and stakeholder expectations and concerns

	1.5/2°C Scenario	4°C Scenario
Impact on Procurement		5. Unstable raw materials procurement due to increased occurrence of climatic hazards
Impact on Direct Operation	1. Decarbonization of iron and steelmaking process 2. Increased needs for effective utilization of steel scrap	6. Damage to production bases and offices caused by climatic hazards
Impact on Product and Service Demand	3. Change in demand for automotive steel, etc. 4. Increase in demand for solutions to enhance decarbonization	7. National resilience

Level of Impact × **Expectations and concerns of stakeholders** → **Axis for identifying key factors**

Axis for identifying key factors:
- Level of impact (possibility of risks and opportunities arising × Level of impact if manifested)
- Expectations and concerns of stakeholders

Results of Scenario Analysis

Climate change is a critical concern from the perspective of business continuity for JFE Group management. Our steel business, which emits 99.9% of the Group's total CO_2 emissions, has been developing technologies for saving energy and reducing CO_2 emissions. We have actively addressed the risks by applying these technologies to steel manufacturing. We will continue to develop processes to further reduce environmental impact while at the same time seeking to turn this challenge into an opportunity for addressing climate change by deploying the technologies we have fostered across the globe.

The JFE Group has developed and maintained a variety of eco-friendly products and technologies, including high-performance steel materials that help save energy when customers use them, as well as renewable energy power generation. We view the current challenges as an opportunity and are contributing to addressing climate change. As automobiles in general become lighter in weight along with the broader adoption of electric vehicles, we will support the transition by improving the functions of the JFE Group's high tensile strength steel sheets and electrical steel sheets. In addition, we will help reduce CO_2 emissions in society by further disseminating renewable energies and implementing recycling initiatives as well as energy conservation.

To achieve the long-term goal of the Paris Agreement of keeping the global average temperature increase well below 2°C compared to pre-industrial levels and to strive to limit it more strictly to 1.5°C, the Group will continue to develop and disseminate innovative technologies and contribute to the prevention of global warming. We will also support national resilience by providing steel for social infrastructure and construction to address the emerging risks associated with the growing severity of meteorological disasters.

Analysis Results

	Changes in Society and Response	Stakeholder Expectations and Concerns for the JFE Group	Results of Assessment
1.5/2°C Scenario **Key Factor ❶** Decarbonization of Iron and Steelmaking Process	Increasing social demand for decarbonized iron and steelmaking process → Implement innovative technology to realize decarbonation at a large scale → Introduction of carbon pricing	• Significantly contribute through innovative technologies • Increase in investment to implement innovative technologies • Increase in operating costs due to the introduction of carbon pricing	Opportunity ↗ Develop and put into practical use innovative technologies in addition to existing ones Risk ↘ Investment into implementing innovative technologies is feasible ↗ Need to accelerate R&D and implementation under 1.5°C scenario → The Group's cost competitiveness will remain the same if uniform carbon pricing is implemented across all countries. ↗ Operating cost increases (if carbon pricing is not properly introduced)
1.5/2°C Scenario **Key Factor ❷** Increased Needs for Effective Utilization of Steel Scrap	Increasing interest for electric arc furnace method for its lower CO_2 emissions → Increasing expectations for electric arc furnace steel Increasing volume of scraps generated	• Electric arc furnace as an alternative to converter furnace • Expanding electric arc furnace steelmaking within the JFE Group	Opportunity ↗ Converter furnace steelmaking is increasing due to constraint on the supply of scrap ↗ Expansion in electric arc furnace steelmaking and electric arc furnace engineering ↗ Expansion in scrap logistics business
1.5/2°C Scenario **Key Factor ❸** Change in Demand for Automotive Steel	Shift in demand for automobiles → Increasing demand for EV motors → Decreasing demand for internal-combustion engines → Cars are lighter in weight and use multimaterials Increasing demand for eco-friendly materials → Demand for decarbonization and high recyclability	• Increase in demand for electrical steel sheets for EV motors • Decrease in demand for special steel due to decreased demand for internal-combustion engines • Alternative steel material for automobiles to meet the trend of using multimaterials • Demand to improve decarbonization and recyclability of steel	Opportunity ↗ Increase in demand for electrical steel sheets due to rising popularity of electric vehicles ↗ Increase in demand for special steel due to higher car sales ↗ Increase in demand for high tensile strength automotive steel sheets ↗ Recyclability of steel regains attention ↗ Increase in demand for low-CO_2 steel products Risk → Effect of trend to use multimaterials is limited
1.5/2°C Scenario **Key Factor ❹** Increase in Demand for Solutions to Enhance Decarbonization	Transition to decarbonized society → Increasing demand for solutions to promote the transition → Overseas expansion of energy-saving technologies	• Renewable energy power generation plant • Promote low-carbon business, or eco solutions, in developing countries using best available technologies (BAT) developed and put into practical use in Japan	Opportunity ↗ Entire construction and operation of renewable energy plants (biomass, geothermal, and solar power generation) ↗ Entire construction and operation of incinerators and plastic recycling plants ↗ Entire construction of CCU/CCS facilities ↗ Overseas expansion of low-carbon business
4°C Scenario **Key Factor ❺** Unstable Raw Materials Procurement due to Increased Occurrence of Climatic Hazards	Increasingly devastating climate hazards caused by temperature rise → Raw materials procurement becomes unstable	• Raw material procurement becomes unstable	Risk → Ongoing specific measures: Diversify supply sources, strengthen capabilities of facilities
4°C Scenario **Key Factor ❻** Damage to Production Bases and Offices Caused by Climatic Hazards	Increasingly devastating climate hazards caused by temperature rise	• Increase in damage caused by typhoons and heavy rain • Increase in damage caused by drought • Flooding caused by sea level rise	Risk → Measures against flood and drought are already in progress → Impact of flooding caused by sea level rise can be addressed with current countermeasures
4°C Scenario **Key Factor ❼** National Resilience	Increasingly devastating climate hazards caused by temperature rise → Increasing the importance of enhancing infrastructure → Increasing demand for disaster mitigation products	• Contribute to reinforcing infrastructure with steel and other relevant products	Opportunity ↗ Reinforce infrastructure with steel and other relevant products

Overview of a Scenario Analysis Assessment

Timeframe: short term (2024) ⇒until 2024, medium term (2030) ⇒until 2030, long term (2050) ⇒until 2050 (final)

FOCUS Key Factor (1) Decarbonization of Iron and Steelmaking Process

We are developing innovative technologies to emerge as the pioneer in realizing a decarbonized society. With a strong financial base to meet investments for implementing innovative technologies, we are significantly contributing to the transition to a decarbonized society.

Short term (2024) Medium term (2030)

JFE Steel has been committed to developing energy-saving technologies toward increasing the efficiency of the iron and steelmaking process and decarbonization. These initiatives have helped JFE Steel acquire technologies that realize the world's top energy efficiency in iron and steelmaking. To further push ahead with decarbonization, the Company will enhance the development of innovative ironmaking processes such as COURSE50 and ferro-coke, which are expected to reduce the carbon footprint through hydrogen reduction and CCS.

We anticipate that achieving the CO_2 reduction target for FY2030 may require investments and loans of around one trillion yen, and approximately 110 billion yen has been approved by FY2022. We intend to steadily advance toward obtaining the necessary investments and loans to achieve the reduction target.

Short term (2024) Medium term (2030) Long term (2050)

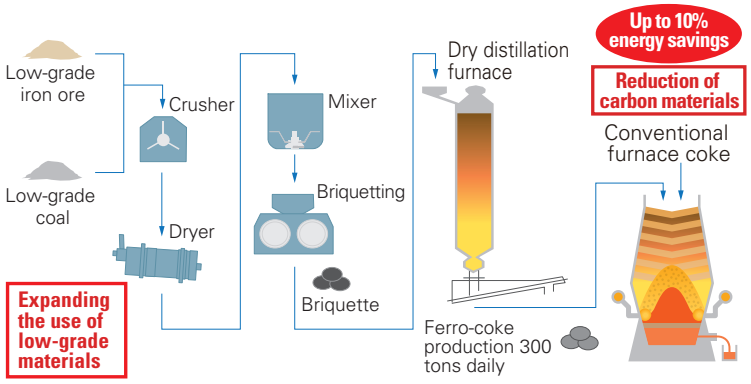
COURSE50 applies hydrogen reduction technology and CCS to reduce CO_2 emissions by about 10% and 20%, respectively, through each technology, for a total reduction of about 30%. The first facility is expected to come online by 2030, followed by the implementation of other plants by 2050, corresponding with the timing for upgrading blast furnace facilities. Ferro-coke is a technology for significantly reducing CO_2 emissions by improving the reduction rate of iron ore put into blast furnaces. In addition to these technologies, we will push forward to establish a hydrogen reduction ironmaking technology which we will aim to put it into practice after 2030 in order to realize the ultimate goal of creating zero-carbon steel.

We consider implementing innovative technologies as critical and will advance with this strategy together with the government. Furthermore, we have a sufficient financial base to meet necessary investments.

For the six-year period from FY2017 to FY2022, JFE Steel worked on the New Energy and Industrial Technology Development Organization (NEDO) project: "Development of Environmental Technology for Steelmaking Process/ Development of Ferro-Coke-Utilization Process Technologies." In the project's final year, we conducted tests to assess the effect of using ferro-coke produced in a medium-scale facility in a blast furnace at the West Japan Works in Fukuyama and confirmed that it lowered the reducing agent rate. The ultimate goal of this technology is to reduce energy consumption in the ironmaking process by approximately 10%. In the future, we will work on identifying issues and researching the operating conditions for achieving this goal by using the mass/energy balance model we have developed for the model steelworks and the general-purpose high-functional blast furnace simulator* that reflects the above test results.

*Developed by Nippon Steel Corporation during the project

■ **Example of Developing an Innovative Technology: Ferro-Coke Production Process**



Long term (2050)

In the long term, we will develop carbon-recycling blast furnaces (CR blast furnaces), hydrogen steelmaking, and electric arc furnaces while striving to achieve carbon neutrality by 2050, as stated in the JFE Group Environmental Vision for 2050. In particular, we have been focusing on a technology that combines a CR blast furnace with CCU. This is an ultra-innovative technology that targets net zero CO_2 emissions by drastically reducing CO_2 emissions from the blast furnace process, maximizing its ability to efficiently produce high-grade steel in mass volume, and enabling CO_2 reuse in the blast furnace. The remaining CO_2 that cannot be fully reused in the furnace will be further reduced by manufacturing basic chemicals such as methanol.

Long term (2050)

International expectations have been rising for organizations to seek pathways for achieving the 1.5°C scenario. We believe the necessary actions are not significantly different from the 2°C scenario. In the 1.5°C scenario, however, the development and implementation of decarbonizing technologies would need to further accelerate, requiring significantly more R&D costs and capital investment. A public infrastructure capable of supplying cheap and ample green hydrogen and electricity would also need to be in place. We believe that addressing these issues will require more support from the government and collaboration across society, including a mechanism for broadly sharing the financial burden and a long-term government strategy for supplying green hydrogen and electricity. The JFE Group has been actively advancing decarbonization initiatives, including commissioning NEDO's Green Innovation Fund project*1, issuing transition bonds*2, and participating in the GX League*3.

➤ *1 NEDO's Green Innovation Fund project (Japanese only) (https://www.jfe-steel.co.jp/release/2022/01/220107.html)
➤ *2 Issue Transition Bonds (https://www.jfe-holdings.co.jp/en/release/2022/01/220120.html)
➤ *3 GX League (Japanese only) (https://gx-league.go.jp/), GX League members (Japanese only) (https://gx-league.go.jp/member/)

The Group's cost competitiveness will remain the same if uniform carbon pricing is implemented across all countries.

Short term (2024) **Medium term (2030)**

Various approaches to carbon pricing have been introduced around the world, and in Japan, emissions trading and the introduction of growth-oriented carbon pricing are being discussed in line with the GX Promotion Law for achieving carbon neutrality by 2050. In Europe, a border adjustment tax is also being discussed.

If uniform carbon pricing is introduced to major emitting countries, the increase in operating cost will be reflected reasonably on the price of steel products both in Japan and overseas, thus maintaining the Company's cost competitiveness. In addition, since CO_2 emissions per unit of steel production is the lowest of all competing materials, steel retains its superior position in cost competitiveness.

On the other hand, the introduction of carbon pricing in a manner that is biased toward certain regions, industries, or countries such as Japan would have a major impact on the JFE Group and particularly on its steel business, as this would further increase the current price of electricity, which is already higher in Japan than in other countries. It may cause the Company to lose its cost competitiveness and may even inhibit innovation and hinder the realization of carbon neutrality. As carbon pricing is introduced, we will need to closely monitor emerging trends to confirm that it will truly contribute to growth.

FOCUS Key Factor (2) Increased Need for Effective Utilization of Steel Scrap

To achieve carbon neutrality, we are focusing on high-grade steel manufacturing and raising efficiency by applying our industry-leading electric arc furnace technology. Furthermore, we will open up opportunities for the entire JFE Group by expanding the use of our electric arc furnaces, increasing the use of our electric arc furnace construction technology, and expanding scrap logistics.

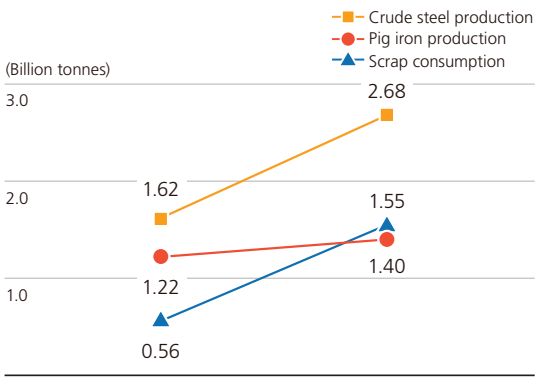
Short term (2024) | Medium term (2030) | Long term (2050)

The JISF predicts that the demand for crude steel will continue rise along with growth of the global population and economic development and that both the blast furnace and electric arc furnace methods will emerge as major, indispensable steelmaking processes (JISF's Long-term Vision for Climate Change Mitigation). To achieve carbon neutrality, we need to expand the production of steel products using the electric arc furnace method, which emits less CO2. For this to happen, we need to explore technologies that improve the productivity of electric arc furnaces and address the constraints in producing high-grade steel products. Additional technologies are required for increasing the volume of scrap used in converter furnaces.

The JFE Group is viewing increased demand for electric arc furnace steel as well as the worldwide increase in the amount of scrap generated as an opportunity, and it will enhance its electric arc furnace steel production while applying its engineering technology for constructing an entirely cutting-edge, energy-saving electric arc furnace facility with the ultimate goal of opening up additional business opportunities. In regard to expanding the use of electric arc furnaces, we have decided to strengthen the electric furnace at the Sendai Works and introduce an electric furnace in the stainless steel manufacturing process in the Chiba district (total investment: approx. 15 billion yen). We are also considering the introduction of a high-efficiency, large-scale electric furnace in the Kurashiki district. Moreover, the Group will advance the development of technologies to utilize scrap and boost industry-wide use of this material.

Meanwhile, securing a stable supply of scrap needed for steel production using electric arc furnaces is another vital issue we must address. Expanding the use of scrap will also generate greater demand for distribution options, which will in turn provide an opportunity for JFE Shoji to expand its logistics business.

■ Estimated Supply and Demand for Steel Production and Scrap Use



FOCUS Key Factor (3) Change in Demand for Automotive Steel

The shift to EVs is accelerating as new and stricter environmental regulations are being introduced globally at a faster pace. Demand for electrical steel sheets for EV motors as well as special steel is increasing as global car sales rise. The increase in the intensity of high tensile strength automotive steel sheets contributes to further weight reductions.

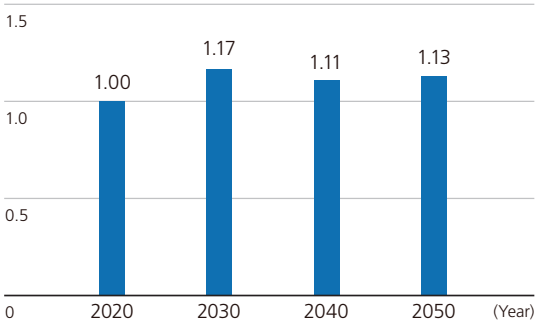
Short term (2024) | Medium term (2030) | Long term (2050)

The increasing popularity of electric vehicles (EVs) has given rise to rapidly expanding demand for electrical steel sheets used in EV motors. JFE Steel has already commercialized the JNE series of non-oriented electrical steel sheets for automotive applications, as part of its eco-product lineup, and has gained a major market share. In the Kurashiki district, we have decided to triple the production capacity of high-grade, non-oriented electrical steel sheets for EV main motors, compared to the current capacity (total investment: approx. 95 billion yen).

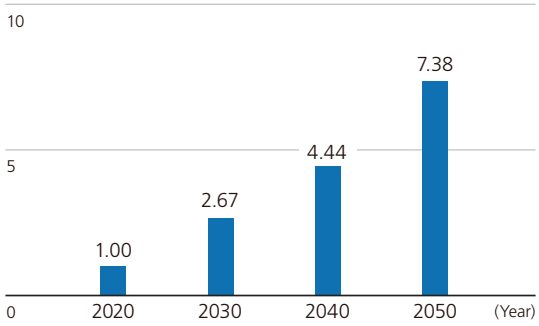
On the other hand, it has been pointed out that an increase in EVs may lead to a decline in the amount of special steel used in engine components. The amount of this type of steel, used in hybrid vehicles and electric vehicles, is 80% and 60% of gasoline cars, respectively. We believe that the risk level for this matter, however, is low since car sales are expected to increase even under the 1.5°C/2°C scenarios and total demand for special steel for cars is increasing.

Nonetheless, the situation for EV remains the same in terms of strong demand for lighter-weight body structures. JFE Steel has developed a cold-rolled steel sheet boasting 1.5 GPa-grade tensile strength as an eco-product and has put it into practical use as an automotive steel sheet. With its high strength, the product can significantly reduce the weight of a car frame. In response to customer demand for more environmentally sound options, we intend to expand its application and further increase its strength, thus dramatically reducing CO2 emissions from cars in motion.

■ Estimated World Demand for Automotive Special Steel



■ Estimated World Demand for Automotive Electrical Steel Sheets



Vertical axis: Steel demand (comparison by year with the year 2020 as 1.00)
Source: Estimated by JFE Holdings based on the reports from METI's Strategic Commission for the New Era of Automobiles

Steel demand will increase due to renewed interest in its highly recyclable quality, essential for decarbonization.

Short term (2024) Medium term (2030) Long term (2050)

Steel is a highly recyclable material that can be reborn as many different products over and over again with no loss in its intrinsic quality. In the future, public resource recycling is expected to increase toward establishing a decarbonized society. We believe that the high recyclability of steel will gain attention once again in light of this transition.

Managing emissions throughout the supply chain (Scope 3) has attracted increasing attention, and this will increase demand for low-CO_2 emission steel products.

Short term (2024) Medium term (2030) Long term (2050)

The rising worldwide support for decarbonization is expected to drive greater demand for low-CO_2 emission steel products, such as in the automobile industry, where CO_2 emissions must be managed throughout the supply chain. In the IEA's Net Zero Emissions by 2050 Scenario (NZE), the share of steel production using electric arc furnaces is expected to increase to 37% by 2030 and 53% by 2050. Since steel production using electric arc furnaces emits less CO_2 than using blast furnaces, customer demand may shift to products manufactured using the former.

The JFE Group considers the growing demand for low-CO_2 emission steel products as an opportunity. We will therefore actively advance the development of ultra-innovative technologies and, during the transition phase, explore other means for supplying products with low environmental impact. In the first half of FY2023, JFE Steel began supplying JGreeX™, a brand of green steel products that significantly reduce CO_2 emissions in the steel manufacturing process compared to conventional products. At present, it is difficult to immediately supply green steel products with significantly lower or zero emissions, so the reductions created by our technologies are allocated to specific steel products by applying the mass balance method and then supplied as green steel products. Reduction of CO_2 throughout the supply chain is rapidly progressing and JFE Steel will contribute to the decarbonization of society by expanding its capacity for supplying JGreeX™ and further reducing CO_2 emissions through the use of advanced low-carbon technologies as well as energy-saving, high-efficiency technologies.

Effect of trend to use multi-materials is limited.

Short term (2024) Medium term (2030) Long term (2050)

Aluminum and carbon fiber reinforced plastic are potential alternative materials for reducing the weight of cars. It has been pointed out, however, that the production cost of these materials and the amount of CO_2 emitted throughout their life cycles is higher than those of steel. Therefore, under the 2°C scenario, which assumes the introduction of a carbon pricing whereby the price differential between steel and alternative materials will be larger. Under this scenario, while the trend of using multi-materials may show some progress for luxury cars, their use would be limited for economy cars. Moreover, considering a situation in which all panels used for doors and other parts of a luxury car were changed to aluminum, the effect on weight reduction could be expected to be 5% of all materials used in luxury and economy cars together.

Multiplied by the number of cars produced, the impact over the total demand for automotive steel can be assumed to be limited.

In the meantime, JFE Steel has developed a multi-material structure that uses a small amount of fiber resin to maximize steel quality. In this new structure, a highly ductile, strong adhesive resin is sandwiched between a body part made of an ultra-high strength steel plate and a part made of a thin steel plate. This structure is capable of further reducing the weight of automobile frame parts and also improving collision safety performance.

We will continue developing and proposing various products and technologies that meet customer needs.

FOCUS Key Factor (4) Increase in Demand for Solutions to Enhance Decarbonization

Providing solutions: renewable energy power generation, Multisite Energy Total Service, recycling business, carbon-recycling technologies, and energy-saving steel technologies

Renewable Energy Power Generation

Short term (2024) | Medium term (2030) | Long term (2050)

Demand for power generation plants using non-carbon emitting renewable energies is expected to increase. The JFE Group engages in designing, procuring, constructing, and operating biomass power generation*1, geothermal power generation*2, solar power generation*3, and onshore wind power generation plants in its engineering domain.

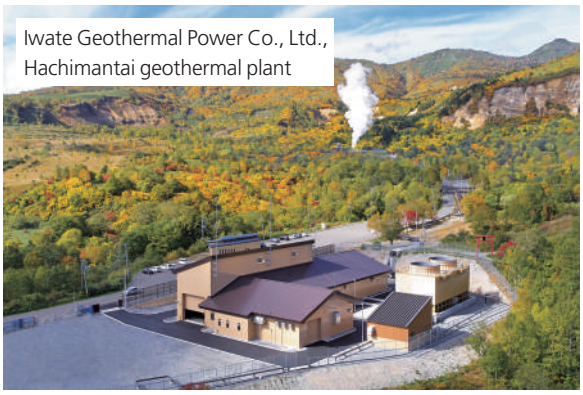
We will also focus on offshore wind power generation, which the Japanese government has positioned as one pillar of its Green Growth Strategy to achieve carbon neutrality by 2050. Specifically, we plan to manufacture and market monopiles and other seabed-fixed structures with JFE Engineering as the main driver. JFE Engineering has started constructing Japan's first monopile-foundation manufacturing plant, scheduled to start production in April 2024*4. JFE Steel will contribute by increasing the supply of large and heavy steel plates, and JFE Shoji will assist by establishing SCM, which includes information sharing with Taiwan, a leader in offshore wind power generation, and East and Southeast Asian countries, where demand is expected to expand. We will also focus on O&M*5 to fully deploy Group resources.

Furthermore, from the perspectives of the effective use and recycling of resources, we are taking action to increase power output at waste processing facilities. JFE Engineering is developing a fully automated operation*6 to facilitate higher power output at waste incinerators (introduced to 12 facilities by FY2022, and will be gradually expanded to 16 facilities).

Moreover, we are utilizing renewable energy as the main power source for our retail electricity business*7, and in helping to establish and operate regional electricity retail companies*8, we focus on local production and consumption of electricity based on renewable energy. In FY2020, we helped 8 locations establish and operate their regional electricity companies. In FY2024, we plan to do the same for around 10 locations, and in FY2030, for around 20.

(Contribution to CO_2 reduction resulting from renewable energy power generation: FY2020: 9.65 million tonnes per year → FY2024: 12 million tonnes per year → FY2030: 20 million tonnes per year)

Waste-to-energy power generation plant



Iwate Geothermal Power Co., Ltd., Hachimantai geothermal plant

Geothermal power generation plant

➤ *1 The JFE Engineering Corporation's biomass power generation (Japanese only) (https://www.jfe-eng.co.jp/products/power/ele07.html)

➤ *2 The JFE Engineering Corporation's geothermal power generation plant (https://www.jfe-eng.co.jp/en/products/power/gene01.html)

➤ *3 The JFE Engineering's solar power generation (Japanese only) (https://www.jfe-eng.co.jp/products/power/ele05.html)

The JFE Technos Corporation's solar power generation (Japanese only) (https://www.jfe-technos.co.jp/products/solar/)

➤ *4 JFE Engineering invests in constructing a new monopile foundation factory (https://www.jfe-eng.co.jp/en/news/2021/20210720.html)

*5 Operation and maintenance business

➤ *6 JFE Engineering's BRA-ING Pre-release (Japanese only) (https://www.jfe-eng.co.jp/news/2020/20200727.html)

➤ *7 Urban Energy Corporation's electricity retail business (Japanese only) (https://u-energy.jp/service/retail.html)

➤ *8 Urban Energy Corporation's regional electric power support business, targeting local governments (Japanese only) (https://u-energy.jp/service/municipality.html)

Establishing regional electricity retail companies in partnership with local municipal governments (CSR Report 2022, P. 116) (https://www.jfe-holdings.co.jp/en/csr/pdf/csr2022e.pdf)

Multisite Energy Total Service

Short term (2024) Medium term (2030) Long term (2050)

In addition to the conventional service of optimizing energy use for single sites, JFE Engineering offers the Multisite Energy Total Service (JFE-METS)*, which optimizes energy use for multiple sites through centralized management. We realize overall energy savings and CO_2 reduction by analyzing energy consumption at multiple sites and achieving total optimization by installing and operating energy-related equipment at each site to circulate energy throughout the network, including remote locations.

➤ *The JFE Engineering Corporation's JFE-METS (Japanese only) (https://www.jfe-eng.co.jp/news/2019/PDF/20200130.pdf)

Recycling Business

Short term (2024) Medium term (2030) Long term (2050)

We are striving to reduce the use of new fossil fuel-derived materials by recycling waste plastic and food waste. In waste plastic recycling, in addition to the conventional recycling of plastic containers and packaging, we are actively engaged in the so-called bottle-to-bottle business, in which used PET bottles are recycled into new ones. We have completed the construction of the PET bottle recycling raw material manufacturing plant (West Japan PET Bottle MR center), and full commercial operation has begun. The plant recycles approximately 10% of the total number of PET bottles shipped nationwide, demonstrating a complete resource recycling model for reducing CO_2 emissions. In food recycling, we generate methane gas from disposed food wastes to create renewable energy (fuel gas and electricity). JFE Engineering manages the engineering, procurement, and construction of recycling plants, while J&T Recycling Corporation manages the operation and business development of the plants*.

Industry-wide decarbonization cannot be achieved through technical developments in manufacturing alone. We therefore believe that demand for CCU and CCS facilities will increase as they facilitate the efficient use and storage of CO_2. JFE Engineering is able to undertake the entire process of building CCU and CCS facilities from design and procurement to construction.

➤ *JFE Engineering and J&T Recycling Corporation's Recycling (Japanese only) (https://www.jfe-eng.co.jp/products/recycle/)

Energy-Saving Steel Technologies

Short term (2024) Medium term (2030)

From the perspective of the steel industry, there is room for disseminating eco solutions (energy-saving steel technologies) in nations such as China, where close to 50% of the world's crude steel is produced, and India and ASEAN countries, where further growth in production is expected. The potential CO_2 reduction achieved by internationally transferring and disseminating advanced energy-saving technologies widely used in Japan will exceed 400 million t-CO_2 worldwide (Japan is estimated to contribute to the reduction of approximately 80 million t-CO_2 in FY2030 through these technologies).

FOCUS Key Factor (5) Unstable Raw Material Procurement due to Increased Occurrence of Climatic Hazards

Ongoing initiatives to address the issue, such as alternative procurement and dispersed supplier bases, and increasing plant capacity.

Short term (2024) Medium term (2030)

In Australia, our major source country for raw materials, the frequency of typhoons is predicted to double. If production and shipments are disrupted in Australia for too long, we may not be able to continue production and would therefore suffer a loss. To address this, we are promoting alternative procurement and dispersed supplier bases.

Alternative procurement and dispersed supplier bases:

Respond to disaster by carrying out spot procurement from China's port stocks, increasing procurement from closer source countries such as Indonesia and front-loading the purchase and/or increasing the purchase contract of different brands from outposts in unaffected regions of Australia. Also, use the stock and external yard of the Group company Philippine Sinter Corporation.

The decarbonization in the steelmaking process is expected to lead to a diversification of the required raw materials. We will take into account the risk of climate change for these materials as well and work to establish diversified procurement sources.

FOCUS Key Factor (6) Damage to Production Bases and Offices Caused by Climatic Hazards

Measures against flood and drought in progress; impact of flooding caused by rising sea levels can be addressed with current countermeasures.

Short term (2024) Medium term (2030)

We are taking action to minimize damage under the assumption that typhoons and heavy rains will become stronger and that the occurrence of disasters comparable to the torrential rain in western Japan in 2018 will rise. We have currently invested approximately 6.5 billion yen for disaster prevention at steelworks and strengthened drainage facilities and other assets. About 3.5 billion yen of separate investment has already been made to prepare for water shortages at steelworks by installing desalination facilities at some of them. Although no severe drought disaster has struck since 1994, we are preparing to minimize any damage, even if the frequency of occurrence should increase.

All steelworks are exposed to the risk of floods associated with rising sea levels because of their location in coastal areas. The estimated sea level rise by 2050 is 20 to 30 cm (70 cm by 2100 if the impact of climate change manifests itself at the highest level). We believe that current measures against storm surge, which generates more sea level rise, are sufficient to address the risk. However, we will continue analyzing climatic hazards going forward to prepare for the changing circumstances.

FOCUS Key Factor (7) National Resilience

Contribute to infrastructure enhancement with products such as high-strength H-shaped steel and steel pipe piles, hybrid tide embankments, and permeable steel slit dams.

Short term (2024) Medium term (2030)

The JFE Group takes seriously the increased frequency and severity of recent climatic hazards in Japan. Also, the daily life of the Japanese citizenry is being exposed to a heightened risk of danger. The JFE Group defines its mission as promoting disaster prevention and mitigation as well as national resilience to maintain vital infrastructure that is essential to daily life and economic activities.

The JFE Group will gather its collective energy to protect key structures from earthquakes using structural steel such as high-strength H-shaped steel and steel pipe piles as well as steel sheet piles. It will also help to reinforce embankments that are prone to bursting and provide disaster prevention products such as hybrid tide embankments and permeable steel slit dams, in addition to reconstructing infrastructure.

➤ Hybrid Tide Embankments (P.81)
➤ Permeable Steel Slit Dams (P.82)
➤ Terre Armée Method (P.82)

Links to information about the JFE Group Environmental Vision for 2050 and Climate Change Scenario Analysis
Commitment to a Low Carbon Society: ➤ Steel Industry Initiatives (P.104)
Targets and Results Related to Climate Change: ➤ Material Issues of Corporate Management and KPIs (P.20)
Initiatives on Climate Change: ➤ Climate Change (P.53)
Technologies and Products Related to Reducing ➤ Development and Provision of Eco-friendly Processes and Products (P.108)

Steel Industry Initiatives

Initiatives

The Japan Iron and Steel Federation (JISF) Initiatives

Long-term Vision for Climate Change Mitigation

The JISF has been focusing on achieving the goals for 2020 under its Commitment to a Low Carbon Society (renamed the Carbon Neutrality Action Plan in FY2021). Furthermore, in November 2018, the JISF formulated and published its Long-term Vision for Climate Change Mitigation for 2030 and beyond, with JFE Steel playing a central role in its development. This document lays out the industry's challenge for realizing zero-carbon steel and explains the pathway for achieving the 2°C scenario for steelmaking and the necessity of ultra-innovative technologies to achieve the 1.5°C scenario. Also, on February 15, 2021, the JISF announced the "Basic Policy of the Japan steel industry on 2050 Carbon Neutrality sought by the Japanese government," declaring that the Japanese iron and steel industry will boldly accept the challenge of realizing zero-carbon steel.

➤ Relevance with the JISF's Long-term Vision for Climate Change Mitigation (P. 93)

JISF's Carbon Neutrality Action Plan

In February 2021, the JISF declared that the Japanese steel industry will boldly take on the challenge of realizing carbon neutrality. The Plan on Commitment to a Low Carbon Society was amended and renamed as the Carbon Neutrality Action Plan, and the Phase II target (2030 target) was revised.

In the Eco Process of the plan, an ambitious 2030 target was set taking into account new perspectives such as the expansion of scrap use as well as the maximum introduction of best available techniques (BATs) based on energy efficiency already among the highest in the world.

Regarding Eco Product, which is intended to reduce GHG emissions at the product use stage, high-performance steel is expected to play a particularly major role in the promotion of offshore wind power and electrification of automobiles, which are among the 14 fields of the government's Green Growth Strategy. Accordingly, the Japanese initiative will accelerate practical global warming measures from a global perspective by making visible the conventional quantitative evaluation of the five types of high-performance steel.

As for Eco Solutions, the JISF will develop a system for introducing appropriate technology for transferring and spreading the production process for decarbonized steel in the Asian regions, where steel production is expected to expand.

Furthermore, regarding Innovative Technology Development, the JISF will take on the challenges of technologies such as direct hydrogen reduction and high-performance steel production using electric arc furnaces under the Green Innovation Fund, in addition to COURSE 50 and ferro-coke.

■ Overview of the Carbon Neutrality Action Plan

Eco Process

Cut energy-related CO_2 emissions (total volume) in FY2030 by 30% compared to the FY2013 level by adopting BATs to promote energy conservation, using waste plastics, adopting innovative technologies that are currently under development and scheduled to be in use around 2030, and using raw fuel with less CO_2 emissions.

Eco Product

Contribute to CO_2 emissions reduction by domestically and internationally supplying high-performance steel. This steel will reduce CO_2 emissions when used in the final product. The reduction potential in 2030 is estimated to be approximately 42 million t-CO_2 for the five steel products that have been quantitatively evaluated for their contribution to reducing emissions.

Eco Solution

Contribute to reducing CO_2 emissions worldwide by transferring and spreading the Japanese steel industry's advanced energy-saving technologies and facilities to the world's steel industry. Estimated contribution on CO_2 emissions reduction is 80 million t-CO_2 in 2030.

Innovative Technology Development

Contribute to carbon neutrality by boldly developing technologies in the following four areas.

- Hydrogen reduction technology using in-house hydrogen
- Low-carbon technology using CO_2 contained in externally sourced hydrogen or blast furnace exhaust gas
- Direct hydrogen reduction technology
- Impurity removal technology for electric furnace using direct reduced iron

Assessment of the 2021 Carbon Neutrality Action Plan (Phase II) Results (JISF)

Total volume of energy-related CO_2 emissions in FY2021 was 163.09 million tonnes, 31.34 million tonnes, or a 16.1% decrease from FY2013. The achievement rate of the FY2030 target (to reduce 30% from FY2013) has progressed to 53.7%. Energy-related CO_2 emissions and energy consumption are both declining, given continued energy-saving efforts.

While the energy efficiency of the Japanese steel industry is among the highest in the world, vigorous efforts are made to promote greater energy savings by having businesses engaged in this effort draw upon subsidies to promote investment in saving energy and other actions.

Revolutionary Iron and Steelmaking Process Development

COURSE50

About 30% of CO_2 emissions can be reduced through hydrogen reduction along with separation and capture of CO_2 from blast furnace gases. The first facility is expected to come online by 2030, followed by other plants by 2050.

Ferro-Coke

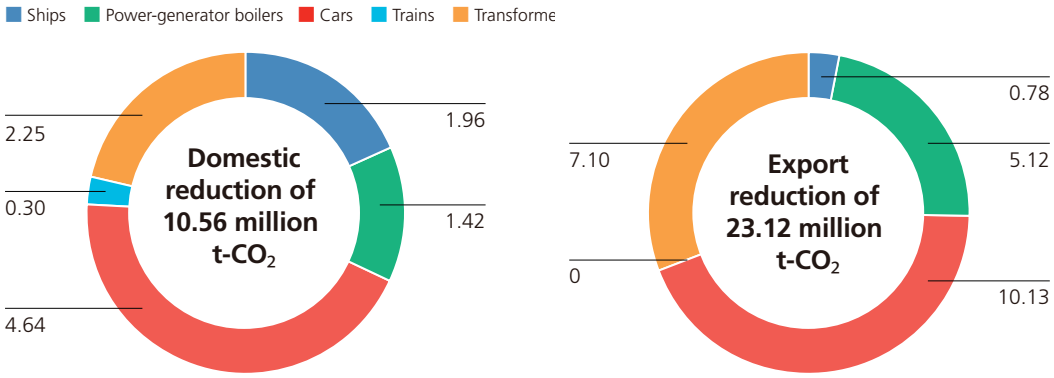
Ferro-coke is an innovative raw material for blast furnaces that is made by mixing low-grade coke and iron ore. In this energy-saving technology, metallic iron acts as a catalyst, reducing the amount of coke required in the furnace and thus significantly reducing CO_2 emissions in the iron making process.

Reduced CO_2 Emissions through High-Performance Steel Materials (Effects of Eco Products)

The Japan Iron and Steel Federation (JISF) calculates the CO_2 emissions reduction impact of using high-performance steel materials. It is estimated that the use of five major high-performance steel materials in cars, transformers, ships, power generator boilers, and trains in Japan and overseas* (FY2021 production: 6.69 million tonnes, 7.3% of crude steel production) helped reduce CO_2 emissions by 33.69 million tonnes (10.56 million tonnes in Japan, 23.12 million tonnes overseas) in FY2021.

* Estimates made by the Institute of Energy Economics, Japan
* The five materials are steel sheets for automobiles, directional electrical steel sheets, thick steel sheets for shipbuilding, steel tubes for boilers, and stainless steel sheets.
* Evaluations for domestic figures are made starting from FY1990. For exports, automobile and ships have been evaluated since FY2003, steel pipes for boilers since FY1998, and electrical steel sheets since FY1996.

■ CO_2 Reduction Resulting from the Use of Five High-Performance Steel Materials in Japan and Abroad (FY2021)



Global Scale Initiatives

Global Actions to Address Global Warming

ISO 14404 is an international standard proposed by The Japan Iron and Steel Federation (JISF) to the International Organization for Standardization (ISO) as a methodology for the globally unified calculation of CO_2 intensity from iron and steel production, ultimately to assess the energy efficiency of steelworks. The Japanese steel industry is addressing global warming through international public-private collaborations, including ISO 14404-based assessment of steelworks in developing countries and recommending specific technologies best suited to India and ASEAN countries. It is continuing this effort together with the Ministry of Economy, Trade and Industry (METI) in order to enhance ISO 14404 so it can be applied to steel manufacturing facilities with more complex structures.

JFE Steel is also addressing global warming by participating in international activities, such as the Japan India Public and Private Collaborative Meeting, the Japan-ASEAN Steel Initiative and the Japan-China Steel Industries Exchange.

In addition, JFE Steel is involved as a member of World Steel Association (WSA)'s Climate Action data collection programme, which uses ISO 14404 as the standard for measurement and calculation.

➤ WSA: Climate Action data collection programme
(https://worldsteel.org/steel-topics/environment-and-climate-change/climate-action/climate-action-data-collection/data-providers/)

■ WSA Climate Action data collection programme certification

JFE Steel

Contribution to Developing the LCA of Steel Material

Accurately evaluating the environmental impact of products requires assessment and quantification of impact over their entire life cycles, from raw resource mining to material production, product manufacture, use, and final disposal. Life cycle assessment (LCA) is one evaluation method.

After final products such as automobiles and buildings finish their mission in society, all of their steel components can be recycled and reused. This closed loop recycling ability is an excellent characteristic of steel materials. Taking this into account through LCA reveals that steel can be viewed as having extremely low environmental impact compared to other materials.

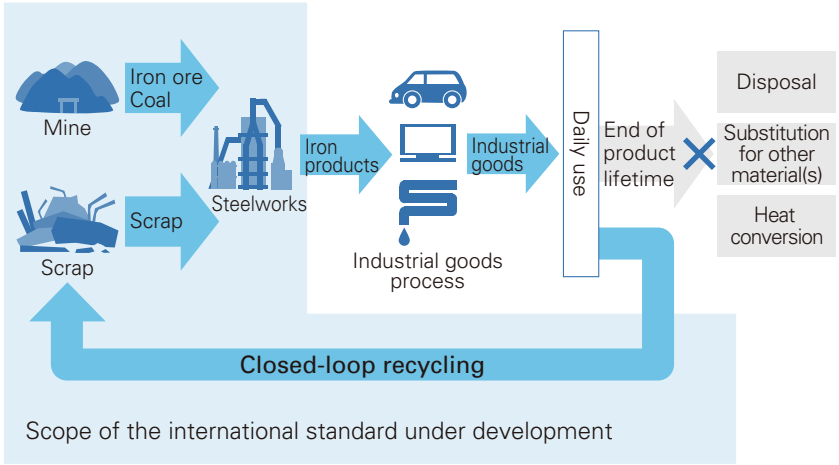
JFE Steel played a major role in the development of ISO 20915 (Life Cycle Inventory Calculation Methodology for Steel Products) and JIS Q 20915 (Life Cycle Inventory Calculation Methodology for Steel Products), initiatives led by The Japan Iron and Steel Federation (JISF), which takes into account the impact of recycling and provides life cycle inventory (LCI) calculation methods specific to steel products.

In addition, 15 Japanese manufacturers of blast furnaces and electric arc furnaces joined forces to calculate the Japanese average for LCI of different steel products. Calculations based on their FY2018 operational data were also published.

JFE Steel acquired EcoLeaf labels, the Japan Environmental Product Declaration program run by the Sustainable Management Promotion Organization (SuMPO), for three steel sheet products for cans (tinplate, laminated steel sheet JFE Universal Brite, and tin-free steel), five building material products (H-beams, JFE Super HISLEND-H beams, extra-thick H beams, construction steel plates, and construction steel columns) and three steel plate products (for offshore structures and wind power equipment, ship building, and UOE steel pipes). We will continue to leverage EcoLeaf labels to help customers promote environmental protection and to strengthen communications with them.

➤ Value of Steel (P.06)

■ Life Cycle of Steel Materials



Related Links

- The Japan Iron and Steel Federation (JISF): Climate Change Policy page (https://www.jisf.or.jp/en/activity/climate/index.html)
- Japan Iron and Steel Federation (JISF): LCA of Steel Products page (https://www.jisf.or.jp/en/activity/lca/index.html)
- Japan Iron and Steel Federation (JISF): Publication of ISO 20915 (https://www.jisf.or.jp/en/activity/lca/iso/index.html)
- Japan Iron and Steel Federation (JISF): Publication of JIS Q 20915 (https://www.jisf.or.jp/en/activity/lca/iso/index.html)
- Japan EPD Program by SuMPO (https://ecoleaf-label.jp/english/)

Development and Provision of Eco-Friendly Processes and Products

Basic Policy

In accordance with its corporate philosophy of contributing to society with the world's most innovative technology, the JFE Group develops and provides processes and products for addressing climate change and reducing environmental impact. In the JFE Group Environmental Vision for 2050, we announced our initiatives for reducing the CO_2 emissions of the Group and expanding our contribution to reducing CO_2 emissions in society as a whole. Apart from these initiatives, we also strive to enhance our corporate value and play our part in realizing a sustainable society through **the development and provision of various processes and products related to preserving the global environment.**

In the steel business, the Steel Research Laboratory is engaged in research and development under the Environmental Management System (environmental strategies) to create a recycling-oriented society capable of sustainable development by providing the world's best technologies and sparking innovation. In the engineering business, the Research Center of Engineering Innovation conducts research and development of new technologies to support the society of the future, including the creation of next-generation energy and solutions to environmental problems.

➤ JFE Steel: Research and Technological Development (https://www.jfe-steel.co.jp/en/research/index.html)
➤ JFE Engineering: Technological Development (https://www.jfe-eng.co.jp/en/rd/)

Initiatives

Primary Eco-Friendly Products and Technologies by Business Segments

Each operating company of the JFE Group leverages its respective strengths to develop and provide a variety of eco-friendly products and technologies.

■ **Primary Eco-Friendly Products and Technologies by Business Segments**

Product/Technology	Environmental Benefit	Operating Company	Status
➤ Technology for optimized combustion of coke furnace (P.110)	Save energy and reduce CO_2 emissions	JFE Steel	Operation in production process
➤ Ferro-coke (P.111)	Save energy and reduce CO_2 emissions		Experimental operation
➤ Fuel/power operation guidance system (P.111)	Save energy and reduce CO_2 emissions		Under development
➤ Resource saving silicon gradient steel sheet (P.112)	Save resources and reduce CO_2 emissions		Commercialized
➤ Thin, fatigue-resistant steel for steel structures (AFD® steel) (P.114)	Recycle resources and reduce CO_2 emissions		Under development
➤ Denjiro® insulation-coated pure-iron powder for soft magnetic composites (P.115)	Recycle resources and reduce CO_2 emissions		Commercialized
➤ Ultra-thick, high-strength steel plate (P.116)	Recycle resources and reduce CO_2 emissions		Commercialized
➤ Materials used in line pipe for transporting high-pressure hydrogen gas (P.116)	Recycle resources and reduce CO_2 emissions		Under development

Product/Technology	Environmental Benefit	Operating Company	Status
Calcia Improvement Material (P.117)	Recycle resources and preserve biodiversity	JFE Steel	Commercialized
Steel slag hydrated matrix (P.117)	Recycle resources and reduce CO_2 emissions		Commercialized
Precast concrete products mixed with finely ground blast furnace slag (P.118)	Recycle resources and reduce CO_2 emissions		Commercialized
Granulated blast furnace slag (P.118)	Recycle resources, preserve biodiversity, and reduce CO_2 emissions		Commercialized
Marine Stone® (P.119)	Recycle resources, preserve biodiversity, and absorb and secure CO_2		Commercialized
Frontier Rock® (P.119)	Recycle resources, preserve biodiversity, and absorb and secure CO_2		Commercialized
Marine Block® (P.119)	Recycle resources, preserve biodiversity, and absorb and secure CO_2		Commercialized
Woody biomass combustion power plant (P.121)	Renewable energy and reduce CO_2 emissions	JFE Engineering	Construction
PPA solar power generation model (P.121)	Renewable energy and reduce CO_2 emissions		Business expansion
Digital transformation service for boiler power plant (P.122)	Save energy and reduce CO_2 emissions		Business expansion
Dam optimal operation system (P.123)	Renewable energy, reduce CO_2 emissions, and responses to climate change (reduce flooding)		Under development and verification test
Recycle PET bottles (P.125)	Recycle resources, reduce CO_2 emissions, and preserve biodiversity (marine environment conservation)	J&T Recycling	Business expansion
Overseas water treatment (P.126)	Environmental conservation (sewage treatment)	JFE Engineering	Business expansion
Overseas bridge business (P.127)	Environmental conservation (reduce traffic)		Business expansion
Contract molding business using metal 3D printer (P.128)	Save energy and resources		Business expansion
Further expansion of global supply chain for the Steel Sheets Business (P.129)	Save energy and reduce CO_2 emissions	JFE Shoji	Sales expansion
Building a supply chain for offshore wind power generation industry (P.129)	Renewable energy		Sales expansion
Expanding business in biomass fuels (P.130)	Renewable energy and reduce CO_2 emissions		Sales expansion
Expansion of scrap trading to help develop a recycling-oriented society (P.130)	Recycle resources and reduce CO_2 emissions		Sales expansion

For further details on the JFE Group Environmental Vision for 2050, refer to the following resources.

- The JFE Group Environmental Vision for 2050 (P.53)
- The JFE Group Environmental Vision for 2050, presentation material on May 25, 2021
  (https://www.jfe-holdings.co.jp/en/investor/climate/presentation/index.html)

JFE Steel

Certification by SuMPO's EcoLeaf Environmental Labeling Program

JFE Steel has acquired certification for EcoLeaf, a Japanese environmental product declaration (EPD) program managed by the Sustainable Management Promotion Organization (SuMPO) in Japan for three types of steel sheets for cans: tinplate, JFE Universal Brite (laminated steel sheet), and tin-free steel; five types of building materials: H-beams, JFE Super HISLEND-H beams, extra- thick H beams, construction steel plates, and construction steel columns; and three types of steel plate products: for offshore structures and wind power generating equipment, ship building, and UOE steel pipes.

EcoLeaf is a Type III EPD program managed by SuMPO for quantitatively disclosing the environmental impact of products and services throughout their life cycle, from raw material procurement to disposal and recycling in accordance with ISO 14025:2006 (environmental labels and declarations, Type III Environmental Declarations, Principles and Procedures). The environmental impact of our products is presented as graphic representations of data to increase transparency. The disclosure of environmental impact data with fairness and reliability assured by third-party review and verification enables customers to quantitatively and objectively evaluate the environmental impact of the products they use.

JFE Steel will continue to actively obtain and disclose EcoLeaf certifications for its products.

➤ SuMPO Environmental Labeling Program (https://ecoleaf-label.jp/english/)

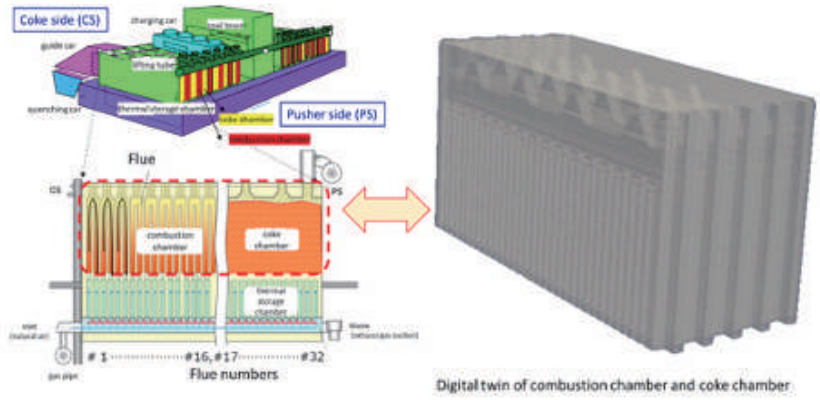
Technology for Optimized Combustion of a Coke Furnace

JFE Steel has completed technological development of a new facility at the coke furnace in the West Japan Works (Fukuyama District), which is capable of saving energy and cutting CO_2 emissions, by using digital-twin technology, and has started the operation of the process.

We intend to transform into an intelligent steel works through the deployment of cyber physical systems (CPSs) as part of our digital transformation (DX) strategy. Digital twins are a core CPS technology in which physical systems and processes in the real world are replicated with equivalent properties in a digital model ("twin") in a virtual space, allowing for an accurate simulation of the real world. These digital models make it possible to visualize highly inaccessible internal areas of facilities to optimize the design and operation of manufacturing processes for which internal conditions have conventionally been difficult to confirm via sensors or direct observation. The use of the digital twin also makes it possible to predict the effects of major changes to facilities or operations.

The technology was applied to process improvements for the operation of the Number 5, D Group coke furnace in the Fukuyama District of the West Japan Works. The information obtained from the digital twin of coke furnace constructed in virtual space confirmed that a mechanism for partially controlling air supply will achieve greater operational efficiency, information that the company can use for calculating the amount of supplemental air needed to optimize combustion. JFE Steel then applied these learnings in developing the new facility, which is now in commercial operation. The company has achieved an approximately 5% reduction in the amount of fuel used and has reduced its CO_2 emissions by 6,600 tonnes a year, compared to the level with the furnace's previous design. This project was chosen for the Japanese government's Sustainable Open Innovation Initiative funding.

■ **Architecture of the coke furnace and the digital twin model**



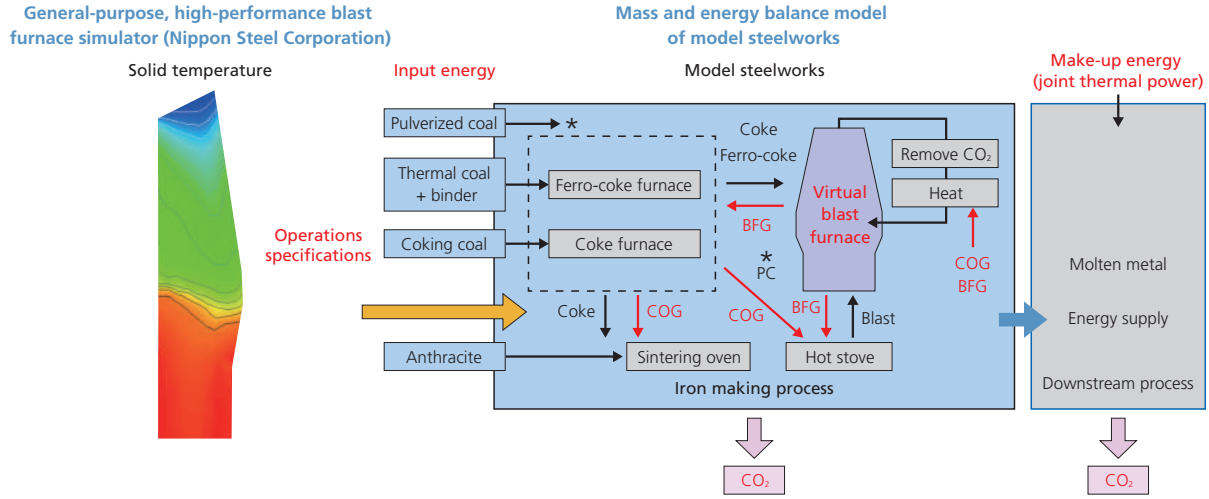
Ferro-coke

Ferro-coke is an innovative raw material for blast furnaces made by mixing low-grade coke and iron ore. In this energy-saving technology, metallic iron contained acts as a catalyst, reducing the amount of coke required in the furnace and thus significantly reducing CO_2 emissions in the iron making process.

In the six years from FY2017 to FY2022, JFE Steel engaged in a project to develop environmental technology for the steelmaking process, and technological development of the iron making process using ferro-coke, a project by the New Energy and Industrial Technology Development Organization. In the project's final year, the company performed tests at a blast furnace in the West Japan Works (Fukuyama District) using ferro-coke produced in a medium-scale facility and confirmed that the coke ratio was reduced. Going forward, to achieve the final goal of the technology development to establish a technology for reducing the energy consumption in the iron making process by approximately 10%, JFE Steel will use a general-purpose, high-performance blast furnace simulator* that reflects the mass and energy balance model applicable to the model steelworks that the company developed, along with the above results, to identify issues and examine the operating conditions needed to achieve the final target.

*The simulator was developed by the Nippon Steel Corporation during the project term.

■ How energy saving and CO_2 reduction are assessed at model steelworks



How energy saving and CO_2 reduction are assessed at model steelworks

Fuel and Power Operation Guidance System for Steelworks

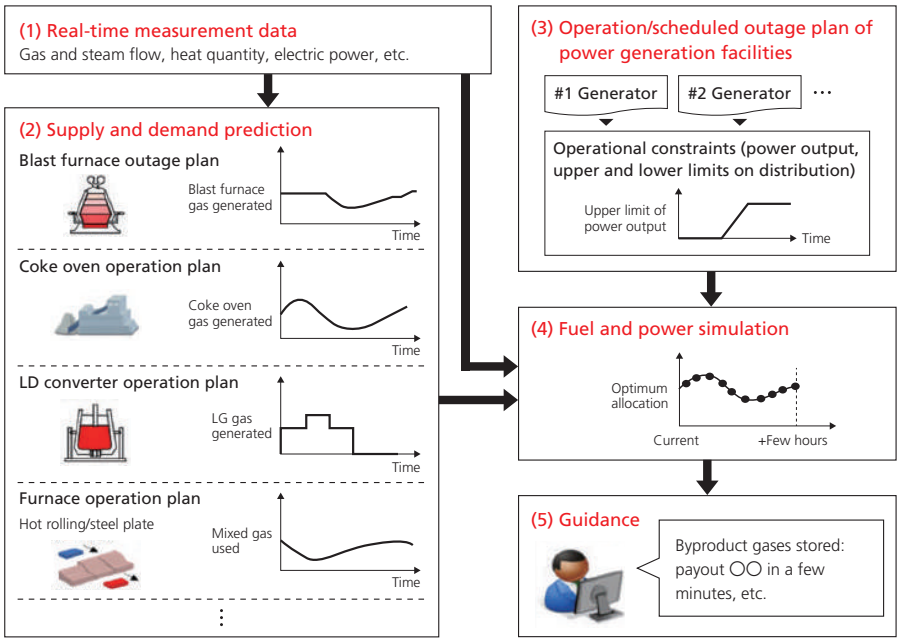
JFE Steel developed a fuel and power operation guidance system for steelworks and succeeded in saving energy and reducing CO_2 as well as fuel and power by optimizing the fuel, steam, and electric power used in the steelmaking process.

Previously, operators determined various factors such as the distribution of byproduct gas to each process, amount of fuel (heavy oil, city gas, etc.) and electricity to purchase, and the amount of byproduct gas stored, taking into account energy demand and supply (amount generated and used) as well as the operating conditions of power generation facilities, to minimize cost and energy loss. However, it was difficult to use this method to accurately estimate the change in energy demand and supply. The guidance system (diagram 1) developed by JFE Steel uses voluminous real-time measurement data (1) obtained through a cyber physical system (CPS)* and the precise production plans of each factory to predict future demand and supply with high accuracy (2), and by taking into account information such as in-house power generation capacity (3), fuel and power simulation allows for the calculation of the optimal operating conditions with the lowest possible purchase from external sources (4), and the results are fed back to guide the operator (5).

The system's development was awarded the Academic Award (Technical Division) of the 2022 Japan Institute of Energy Award . JFE Steel established the JFE Digital Transformation Center (JDXC®) to promote CPS within the manufacturing process and other digital transformation initiatives to achieve innovative production improvements as well as stable operations. We remain committed to realizing a sustainable society by adopting digital transformation to address the various issues identified at production sites.

* A system that brings together a vast amount of sensor information about physical space as big data in cyberspace and generates value by feeding back in real time the results analyzed by various measures for application in the physical space.

■ **Guidance System Overview**



➤ JFE Steel receives Academic Award (Technical Division) of the 2022 Japan Institute of Energy Award (Japanese only)
(https://www.jfe-steel.co.jp/release/2023/03/230301.html)

Resource Saving Silicon-Gradient Steel Sheet

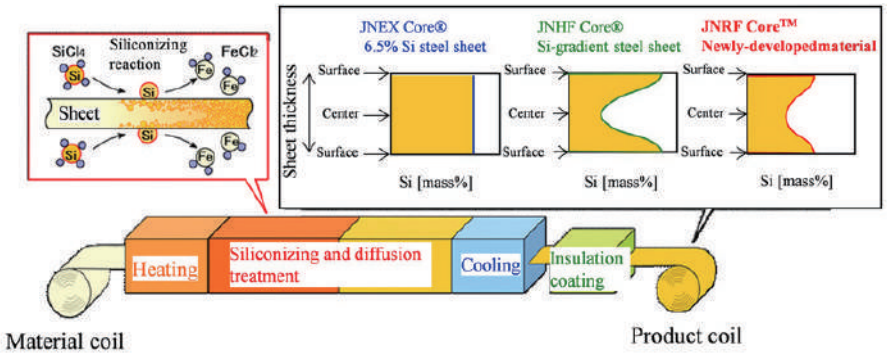
The recent trend toward increasing driving frequency due to the downsizing of electrical equipment has intensified the need to reduce iron loss*1 in the high-frequency range for electrical steel sheets*2, widely used as iron core material for electrical equipment such as motors and transformers. Meeting this demand depends upon increasing the concentration of silicon (Si), an element that strengthens electrical resistance. However, increasing concentration also causes magnetic flux density to decrease at the same time.

To overcome this, JFE Steel developed JNHF®, JNSF®, and JNRF® using its proprietary chemical vapor deposition (CVD) continuous siliconizing process technology for controlling Si concentration distribution. These products exhibit low iron loss at high frequencies and high magnetic flux density, significantly contributing to greater efficiency while downsizing electrical equipment, and they are used as an iron core material for reactors for solar power generation and high-speed motors.

In recognition of the positive social impact of this development, we received the 2022 Award for Science and Technology from the Minister of Education, Culture, Sports, Science and Technology under the development category of the science and technology field. JFE Steel will continue to contribute to improving electrical equipment by raising efficiency, reducing size, and saving energy by providing high-performance, high-grade electrical steel sheets.

*1 The loss of energy, primarily as heat, that occurs when the iron core is excited by an alternating current. The less iron lost, the higher the efficiency of electrical equipment.
*2 Electrical steel sheets are obtained by adding silicon to iron and are widely used as iron core materials in equipment such as motors and transformers.

■ **CVD Continuous Siliconizing Process and Si Concentration Distribution Control**



➤ **Received the 2022 Award for Science and Technology from the Minister of Education, Culture, Sports, Science and Technology under the science and technology field (development category). (Japanese only)**
(https://www.jfe-steel.co.jp/release/2022/04/220408.html)

➤ **External Awards** (P.259)

Further Expanding Electrical Steel Sheet Production Capacity at the West Japan Works (Kurashiki District)

JFE Steel aims to expand the electrical steel sheet capacity of its West Japan Works (Kurashiki District) in the first half of FY2024 and is also considering a plan to expand the capacity even further in the future.

The electrification of automobiles is accelerating amid the global push toward carbon neutrality. The demand for high-grade, non-oriented electrical steel sheet products used in the drive motors of electric vehicles is expected to continue expanding in parallel with the further tightening of global environmental regulations. In response, JFE Steel has decided to further expand production capacity to accommodate the rising demand.

The company expects to continue investing in expanding its supply capacity for a high-grade, non-oriented, and grain-oriented electrical steel sheet in anticipation of further increases in worldwide demand as more automobiles become electric, energy use becomes more efficient, and renewable energy is more widely adopted.

The company will steadily strengthen its overall manufacturing operations in Japan with world-class technologies for manufacturing advanced products that reduce CO_2 emissions and thereby contribute to a more sustainable world.

About Electrical Steel Sheets

Electrical steel sheets contain additives such as silicon and aluminum and offer excellent magnetic properties, including high magnetic flux density and low iron loss. Two types of sheet are available. The non-oriented electrical steel sheet offers excellent magnetic properties that are nearly uniform in all directions and is used in the iron cores of motors. The grain-oriented electrical steel sheet exhibits superior magnetic properties in a single (rolling) direction and is used in the iron cores of power and distribution transformers.

Overview of the Expansion

Total expected investment: approximately 46.0 billion yen
Target startup year: FY2026
Expected production capacity: triple the plant's original production capacity for the top-grade, non-oriented electrical steel sheet for electric vehicle primary motors

Anti-Fatigue Damage Steel for Increased Bridge Safety (AFD® Steel)

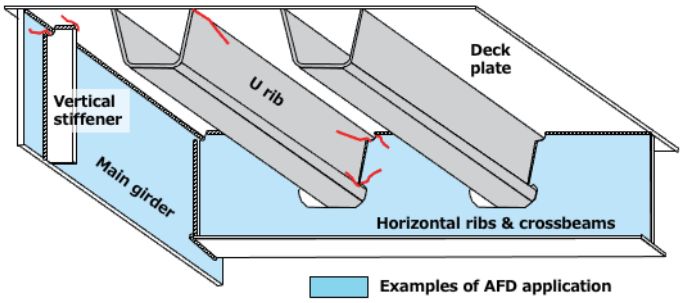
JFE Steel has developed a thin version of its anti-fatigue-damage steel (AFD® steel) with improved fatigue resistance. The steel plate, produced by a plate mill at the East Japan Works (Keihin District) using the Super-RQ system with advanced cooling control, has a minimum thickness of 9 mm and retains the mechanical properties of conventional plates while offering improved fatigue resistance. Compared to AFD® steel, the thin-walled version is expected to be deployed in a wider range of applications, including bridge structural members that are prone to cracking over time.

Ensuring low maintenance and renewal costs associated with aging is crucial for steel structures purposed for long-duration use. Thin-walled members of bridges are susceptible to fatigue cracking over time, and the cracks may increase in size between inspections and maintenance. The newly developed AFD® steel increases the durability of steel structures because it can be used in places prone to fatigue cracking. Compared to ordinary steel, AFD® steel reduces the fatigue-crack growth rate*1 to half or less of the upper limit of ordinary steel and roughly doubles product life, thereby reducing life cycle costs associated with long service life.

Looking ahead, JFE Steel will continue to improve the performance and quality of steel to achieve superior durability, safety, and economy in steel structures, including bridges, ships, construction machinery, and industrial machinery, thereby contributing to a more sustainable world.

*1 Fatigue damage is caused by small, repeated forces that create cracks that gradually grow until the material fails. Since these cracks propagate incrementally with the repeated application of force, the length over which the cracks propagate per repetition is called the fatigue crack growth rate.

■ Examples of Thin AFD Steel Application



➤ Developed thin, fatigue-resistant steel for steel structures (https://www.jfe-steel.co.jp/en/release/2023/230330.html)

Denjiro® Insulation-Coated Pure-Iron Powder for Soft Magnetic Composites

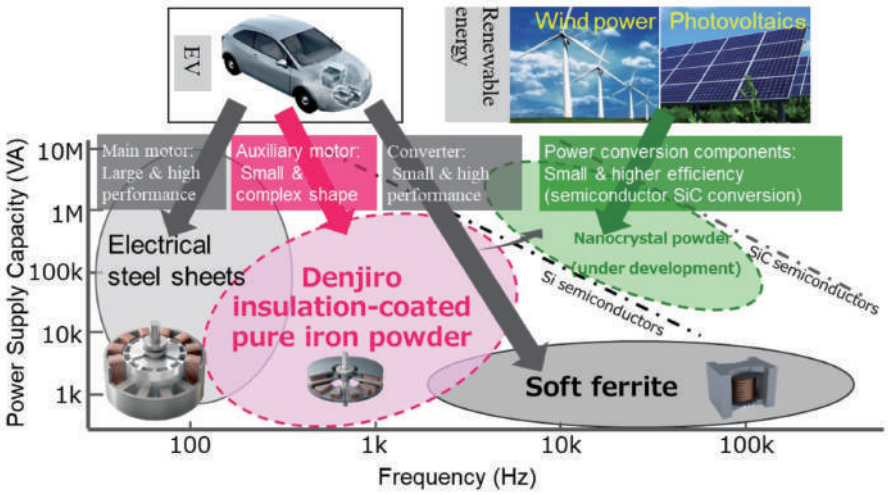
The dual demand for extra-compact and high-torque features in motors is growing in parallel with the advance of electric vehicles and other initiatives for a carbon-neutral society. JFE Steel developed Denjiro®, an insulation-coated pure iron powder for soft magnetic composite to meet this demand.

A soft magnetic composite is an iron core made by applying an insulation coating to a soft magnetic* iron powder and then compression-molding the powder. Compared to electrical steel sheets, which are widely used for iron cores, soft magnetic composites exhibit low loss at high operating frequencies and possess magnetic characteristics well suited for complex-shaped iron cores. The manufacturing yield of soft magnetic composites is favorable, allowing high-rpm motors to be produced at reduced cost. Furthermore, copper wire can be easily recovered when these motors are disposed, making it a highly recyclable product.

A soft magnetic composite developed with Denjiro® is one of the best materials for high-rpm and axial gap motors that favor high torque. With the commercialization of Denjiro™, the JFE Group has established a system for providing a broad lineup of soft magnetic materials for nearly all currently applicable frequency ranges, from electrical steel sheets to soft ferrite cores, and has emerged as the world's only comprehensive supplier that can provide optimal one-stop solutions for all power supply equipment, including motors.

* Soft magnetism is a property in which the magnetic force flexibly changes in response to changes in electric current. These materials are suitable for use in the iron cores of motors and transformers.

■ **JFE Group's Soft Magnetic Materials**



➤ **Development of the Denjiro™ Insulation-coated Pure-iron Powder for Soft Magnetic Composites**
(https://www.jfe-steel.co.jp/en/release/2022/220127.html)

Extra-Thick, High-Strength Steel Plate for the Materialization of Large Container Ships

The world's thickest crack arrest steel plate*1, developed by JFE Steel, is applicable to large container ships, with its 460 MPa class yield strength and a thickness of 100 mm. The technology is the first in the world to satisfy two different properties in the thick steel plate: weldability and crack arrestability. Container ships are designed with wide open areas at the top of the deck. Since the hull is exposed to heavy wave force throughout the voyage, the top of the deck and the side of the hull (hatch side coaming) must be built with steel that is thick with high strength. In response to the recent trend of upsizing container ships for more efficient transportation, the thickness of steel plates has increased from 50 mm to 100 mm, with an expected yield strength of 460 MPa. At the same time, an excellent crack-arrest property is required to prevent the propagation of brittle crack. To ensure the safety of hulls that are rapidly becoming larger, the International Association of Classification Societies mandated that all 80 mm to 100 mm class thickness steel used in hatch side coaming must have at least 8,000 N/mm^3*2 arrest toughness (Kca). Using TMCP technology*2, JFE Steel precisely controlled the heating and rolling temperatures and established a proprietary technology that increases the crystallization ratio in the central part of the steel plate's thickness, helping ensure high brittle crack arrestability in the world's thickest, 100 mm, high-strength steel plate.

The development of this technology received the 2023 Award for Science and Technology from the Minister of Education, Culture, Sports, Science and Technology under the development category of the science and technology field for significantly contributing to the materialization of ultra-large container ships. It has been awarded many other prizes including the 2018 Invention Prize of National Commendation for Invention and the 2019 Okochi Memorial Prize. We will continue to improve the economic efficiency, safety, and reliability of vessels by providing high-performance, high-quality steel material while meeting the diversified needs of customers and also addressing global environmental concerns, and contributing to the realization of a sustainable society.

*1 A steel plate with excellent performance in minimizing vessel damage by stopping brittle crack propagation in the event of weld cracking.
*2 A thermo-mechanical control process technology that improves the strength and toughness of steel material in an online process using controlled rolling and accelerated cooling systems.

➤ **Received the Award for Science and Technology from the Minister of Education, Culture, Sports, Science and Technology under the science and technology field (development category)(Japanese only)**
(https://www.jfe-steel.co.jp/release/2023/04/230407.html)

R&D into Line Pipe for Transporting High-Pressure Hydrogen Gas

JFE Steel's research and development into the property evaluation of line pipe for transporting high-pressure hydrogen gas has been selected for inclusion in a hydrogen-related technical development under The Nippon Foundation*1—DeepStar*2 Joint Research & Development Program on Offshore Oil and Natural Gas*3 ("the Project"), which is being conducted in cooperation with major oil companies. JFE Steel will work with DeepStar consortium members ExxonMobil of the U.S.A. and TotalEnergies of France to establish evaluation criteria and methods using the company's Mighty Seam® electric-resistance-welded steel pipe*4 to transport high-pressure hydrogen for realizing the world's first commercial high-pressure hydrogen pipeline.

The large-scale use of hydrogen for various purposes, such as fuel for power generation, is being widely considered for achieving carbon neutrality by 2050. The use of a pipeline similar to the current supply chain for natural gas is being explored for transporting hydrogen in bulk from the receiving terminal to where it is needed.

Meanwhile, hydrogen causes steel materials to become brittle (reducing ductility). Consequently, methods for evaluating the performance of materials are being established in countries other than Japan to support safety standards and quality inspections. In the Project, JFE Steel's Steel Research Laboratory in Chiba, Japan, will research properties required for high-pressure hydrogen pipelines, particularly through the application of the Engineering Critical Assessment*5. The company will also evaluate performance under high-pressure hydrogen environments using a steel pipe specimen. Technological developments that meet the needs of oil companies will be pursued through strengthened cooperation under the shared goal of contributing to decarbonization.

*1 A public interest incorporated association designated as a ship promotion organization by the Ministry of Land, Infrastructure, Transport and Tourism of Japan. Funding for its activities is drawn from the proceeds of motorboat racing held by local governments throughout Japan, to primarily support maritime shipping-related business, engage in public services/welfare business, and international cooperation.
*2 An offshore technology development consortium consisting of businesses that engage in globally exploring, developing, and producing offshore oil and natural gas, such as Chevron (U.S.), Shell (U.K.), and Equinor (Norway), as companies that carry out offshore oil field development and production, and other businesses, universities, and research institutions that offer products and services to those businesses.

*3 A joint grant program of the Nippon Foundation and DeepStar for research and development projects for advancing decarbonization in offshore oil and natural gas areas.(Japanese only) (https://www.nippon-foundation.or.jp/who/news/information/2023/20230113-83742.html)

*4 An electric-resistance-welded steel pipe for line pipe, with excellent weld quality. (https://www.jfe-steel.co.jp/en/products/pipes/linepipe.php)

*5 A technology for evaluating safety from a mechanical standpoint, by comparing the forces acting on a structure with material toughness obtained from material testing.

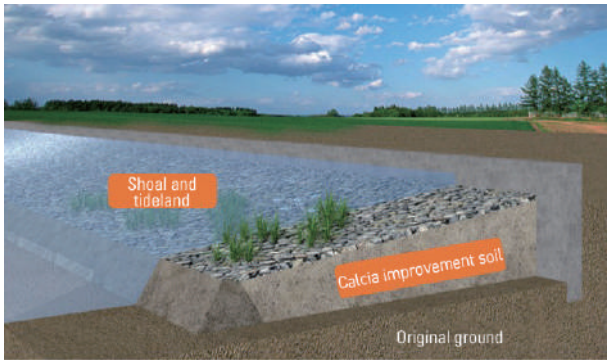
Calcia Improvement Material

Calcia improvement material is a slag product that uses converter-type steelmaking slag as raw material and is manufactured by controlling the composition and adjusting particle size. Dredged soil mixed with calcia improvement material is called calcia improvement soil, which is stronger than the original weak dredged soil and is therefore able to prevent dredged soil from dissipating into the surrounding area and having a negative environmental impact placed in water.

This enables the effective use of weak dredged soil in land reclamation, shoal and tideland construction, and refilling former dredging sites. Calcia improvement soil has been used to construct a mid-section submerged breakwater* (Shin Honmoku Pier, Port of Yokohama), the main embankment material for creating a shallow area (incidental facilities at the sediment disposal site, Tokuyama-Kudamatsu Port) and backfilling material for an earthquake-resistant quay wall in the Mino offshore area, Fukuyama Port.

*An embankment built under the water surface on the inside of a perimeter wall to divide the land into sections for reclamation.

■ **Calcia Improvement Material and Calcia Improvement Soil**



Example of calcia improvement soil application (shoal and tideland construction material)

Steel Slag Hydrated Matrix

Steel slag hydrated matrix is a steel slag product that can be used as a substitute for concrete but uses ground granulated blast furnace slag instead of cement, and steel slag instead of natural gravel and sand aggregate, as its ingredients. It effectively uses steel slag and does not rely on natural aggregate, thereby reducing environmental impact, and uses less cement, in turn reducing CO_2 emissions.

There are many examples of blocks and artificial stones made from steel slag hydrated matrix being used as a substitute for concrete blocks and natural stones in harbor works, including the Runway D construction project at Haneda Airport by the Ministry of Land, Infrastructure, Transport, and the coastal reconstruction project after the Great East Japan Earthquake. In addition, we are conducting on-site monitoring in the Katsunan Central Zone of Chiba Port with the help of a local fishing association to assess the impact of these blocks on marine biodiversity.

Wave-dissipating and foot protection block

Artificial stones made from steel slag hydrated matrix

Precast Concrete Products Mixed with Finely Ground Blast Furnace Slag

Finely ground blast furnace slag can be used as a cementing material in concrete. This type of concrete exhibits significantly higher durability under harsh conditions such as applications in sewers and exposure to anti-freeze agents. Its effectiveness in reducing environmental impact is widely understood, although there has recently been growing interest in its practical applications for concrete constructions that require higher durability.

As one of the deliverables for the Japanese government's Strategic Innovation Promotion Program, the Japan Society of Civil Engineers published a draft guideline in March 2019 on the application of finely ground blast furnace slag to precast concrete product, and its application now includes precast concrete slabs installed in highways and piers. With the application of finely ground blast furnace slag in concrete, the durability of precast products is expected to be greater and more consistent, allowing them to contribute to building national resilience.

Precast concrete slabs mixed with finely ground blast furnace slag installed in piers

Use of Granulated Blast Furnace Slag to Reduce CO_2 Emissions

Granulated blast furnace slag in crushed and powdered form can be mixed with cement and used as a substitute for cement for making concrete. This leads to reducing the production of cement, thus lowering CO_2 emissions. For example, producing 1 tonne of blast furnace slag cement with 45% of its content substituted with granulated blast furnace slag emits 42% less CO_2 than conventional cement. In FY2021, JFE Steel supplied approximately 6.6 million tonnes of granulated blast furnace slag to cement production, equivalent to a reduction of approximately 4.74 million tonnes of CO_2 emissions.

■ CO_2 Emissions for Producing 1 Tonne of Cement (Unit: kg-CO_2/ton)

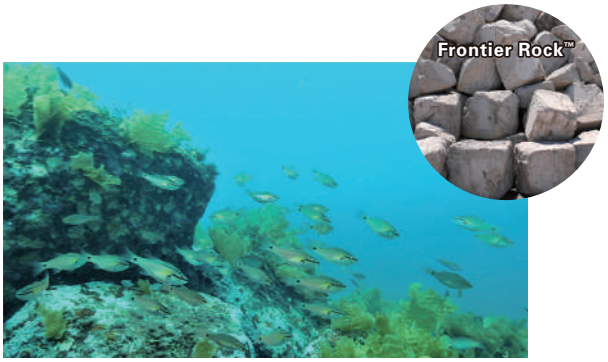
CO_2 Emissions Source	Regular Cement	Blast Furnace Slag Cement
Limestone	476	270
Electricity/energy	283	170
Total	759	440

Source: Data published by the Japan Cement Association

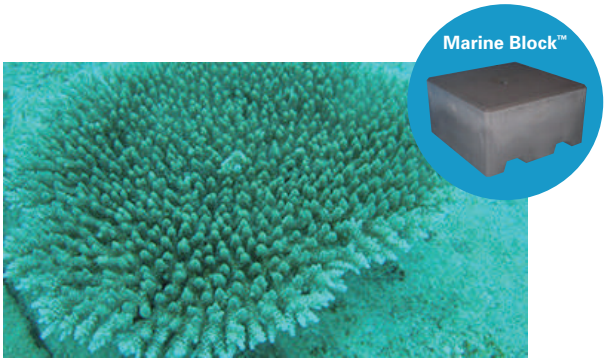
Restoring Marine Ecosystems Using Steel Slag Products

Marine Stone® is a grain-size-adjusted steel slag that controls the generation of hydrogen sulfide from the silty sediment in enclosed coastal seas and improves the environment in which organisms can live. Its effectiveness in improving marine environments is widely recognized, and the joint project with Hiroshima University has received external commendations.

Frontier Rock® is another steel slag product that consists of artificial stones made from steel slag hydrated matrix and provides an excellent base for seaweed beds and fishing reefs. A submerged bank built on the seabed off the coast of Minami-Izu Town, Shizuoka Prefecture, has become a gathering place for large perennial seaweeds as well as useful fishery resources such as lobsters, turban shells, and a wide variety of fish. We are also testing the effects of Marine Block® as beds for corals.



School of fish attracted to the submerged bank made of Frontier Rock®

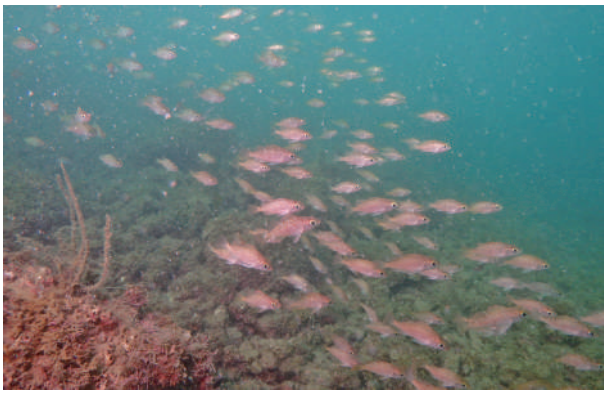


Coral growing on Marine Block®

Initiatives for Blue Carbon Using Steel Slag Products and Acquisition of J Blue Credit®

In recent years, research on blue carbon (carbon absorbed and stored by living organisms in the ocean) has been advancing. JFE Steel has been participating in the research by creating a seaweed bed using steel slag products and measuring the amount of carbon captured by the entire bed.

The company has been collaborating with Koujiro Fisheries Cooperative (Iwakuni City, Yamaguchi) and the National Institute of Technology, Ube College (Ube City, Yamaguchi) on a project to create a seaweed bed and ecosystem using recycled materials at areas around Shinto, Iwakuni City, since FY2012. The initiative involves creating a seaweed bed with rich biodiversity using Marine Stone®, a grain-size-adjusted steel slag, and other steel slag products, and measuring CO_2 absorption of the created beds. The cumulative amount of CO_2 absorbed and stored from 2018 to 2021, which totaled 79.6 tonnes, received J Blue Credit® certification by the Japan Blue Economy Association . This was the first certification ever given to a three-party joint project by the Fisheries Cooperative, academia, and private business. The seaweed bed created through the project had the co-benefits of offering a gathering place for diverse fish. The sea area is also useful for education and research.



School of rockfish gathered around the steel slag seaweed bed

Excellent place for education and research (photo from the National Institute of Technology, Ube College)

JFE Steel and Tohoku University's Collaborative Research Laboratory for Green Steel

In February 2022, JFE Steel and Tohoku University jointly established the Collaborative Research Laboratory for Green Steel within the university's Graduate School of Engineering to research eco-friendly steel materials and production metho-ds for the carbon-neutral era.

The Collaborative Research Laboratory is managed under a cross-divisional system and develops collaborations across a wide range of fields, including the development of steelmaking processes and materials. This will facilitate a multifaceted approach to resolving issues related to low-carbon steelmaking processes and to discover innovative development themes from new perspectives. Furthermore, we will dispatch young researchers to nurture highly specialized human resources who will lead the next generation of the steelmaking industry.

Collaborative Research Wing, Materials Development, Graduate School of Engineering, Tohoku University

➤ JFE Steel and Tohoku Univ. Establish Collaborative Research Lab for Green Steel (https://www.jfe-steel.co.jp/en/release/2022/220203.html)

JFE Engineering

JFE Engineering's Commitment through Its Business

With the corporate purpose "Foundation of Life—Just For the Earth" in mind, JFE Engineering is committed to achieving the SDGs in five areas: waste to resources, carbon neutrality, combined utility services, infrastructure, and digital transformation (DX).

Waste to resources businesses include food recycling, plastic recycling, and waste incineration/power generation. Businesses related to carbon neutrality focus on renewable energies, such as offshore wind, solar, biomass, and geothermal power generation. Combined utility services offered by the company include utility services (e.g., water, electricity, gas) that address regional concerns by launching new local electric power companies and offering heat supply services. The company's infrastructure business constructs bridges, gas plants, waterworks plants, pipelines, and other infrastructure by identifying needs such as robustness and longer service life. The DX project involves improving the efficiency of daily work as well as providing products and services that leverage digital technologies such as AI and IoT.

➤ JFE GROUP REPORT 2021 (PP. 43–44) (https://www.jfe-holdings.co.jp/en/investor/library/group-report/2021/pdf/all.pdf)

Commercialization of One of Japan's Largest Woody Biomass Combustion Power Plants

The construction of Tahara Biomass Power LLC, a 112 MW woody biomass combustion power plant, one of the largest of its kind in Japan, with jointly investment by JFE Engineering, Chubu Electric Power Co., Inc., Toho Gas Co., Ltd., and Tokyo Century Corporation, began in 2022, with startup targeted for September 2025. In biomass power generation, wood pellets and other biofuel are combusted to generate electricity. This renewable energy source features easily adjusted output and can stably produce power, thereby contributing to the realization of a carbon-neutral, sustainable society.

Rendering of the completed woody biomass combustion power plant, one of the largest of its kind in Japan (Tahara Biomass Power Plant)

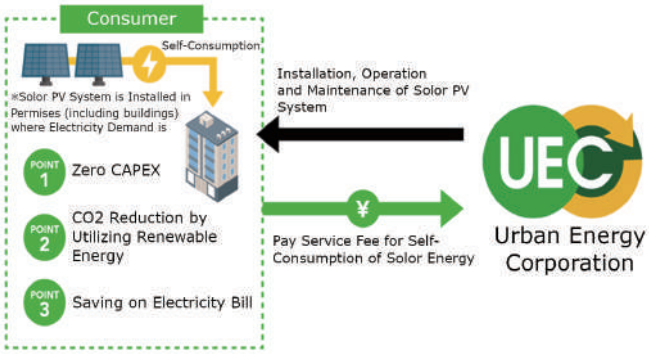
➤ **Construction Begins for Tahara Biomass Power Plant, a 112 MW Woody Biomass Combustion Power Plant, One of Japan's Largest (Japanese only)** (https://www.jfe-eng.co.jp/news/2022/20220601.html)

➤ **Construction Begins for One of Japan's Largest Biomass Power Plants (Japanese only)**
(https://www.jfe-holdings.co.jp/investor/zaimu/g-data/jfe/2022/2022cyu-jigyou.pdf)

Expanding PPA Model Solar Power Generation, Zero-Emi Plan® On-site Service throughout Japan

Urban Energy Corporation , a subsidiary of JFE Engineering, has been offering a solar power generation service, Zero-Emi Plan® On-site Service. The service is based on a solar power PPA model*, in which the company installs a solar power generation system on a host customer's property on the roof or the ground, and sells the generated power to the host customer on a long-term basis. The customer can use electricity from renewable sources with no initial investment and can also expect reduced electricity costs.

* A power purchase agreement (PPA) model in which a third-party installs a solar power system on a host customer's property on the roof or the ground, and sells the generated power to the host customer on a long-term basis. There are two types depending on where the system is installed. For on-site service, installation is done where the energy will be consumed, while off-site service is installed in a different location.



➤ **Zero-Emi Plan® On-site Service, a Solar Power PPA Service by Urban Energy Achieved a Total of 50 MW Worth of Contracts—2.5 Times the Previous Year, Positioned as a Plan to Add High-value to the Existing Service (Japanese only)**
(https://www.jfe-eng.co.jp/news/2023/20230420.html)

Digital Transformation Service for Boiler Power Plants (RODAS®)

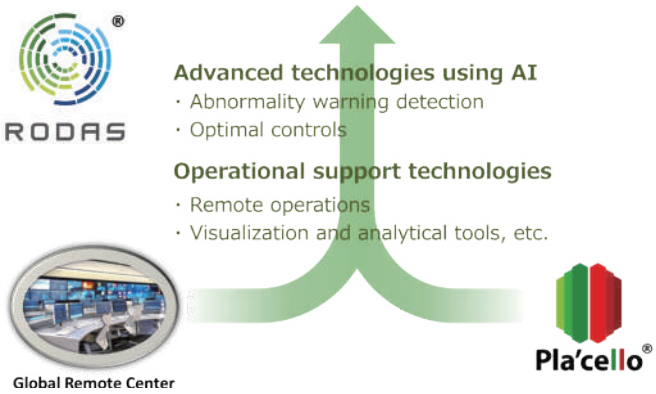
RODAS® is JFE Engineering's brand for providing digital transformation (DX) service for boiler power plants. As shown in the following diagram, the service consists of a Global Remote Center for gathering real-time plant operation data under the company's cloud environment, and Pla'cello®, a data analysis platform for analyzing data. Various services can be developed and provided by combining the two technologies with expertise in boiler plant operations. Examples of tools and services that help improve the efficiency of plant operations include a downloadable tool that offers access to the latest operational and weather data anytime, anywhere; a visualization analysis tool that can be intuitively operated to run time-series data analysis; and a remote maintenance service for distributed control system. The new combustion control system is a plant operation optimization service that saves energy in fans used in power plants and reduces CO_2 emissions, leveraging the system development capabilities provided by AI in Pla'cello® to analyze big data.

RODAS® was highly regarded as a DX service that contributes to saving energy and won the Minister of Economy, Trade and Industry Grand Prize, the highest award under the Energy Conservation Business Models category of the Energy Conservation Grand Prize 2022. It has already been made available for some users of JFE Engineering boilers by being introduced to four plant sites under paid service agreement, as of March 2023. In addition to services already implemented, AI-based anomaly detection service, EPC, and other new services for improving the efficiency of work that requires expertise in plant operations are being developed in response to user feedback.

* An abbreviation for Realize Operation by Digitalizing, Analyzing, and Synthesizing, and it also means "a wheel" in Portuguese. It represents our vision to bring together integrated know-how and analysis of all data to realize advanced plant operation, as well as our approach to connect with users to move forward into a better future.

■ **Won Energy Conservation Grand Prize 2022**

■ **Diagram of RODAS®**



➤ **RODAS® Wins the Minister of Economy, Trade and Industry Grand Prize, Energy Conservation Grand Prize 2022—Realizing More Efficient Boiler Power Plant Operation with Digital Transformation Service Package(Japanese only)**
(https://www.jfe-eng.co.jp/news/2023/20230202.html)

➤ **JFE Engineering's Digital Transformation Strategy (RODAS®)**
(https://www.jfe-eng.co.jp/dx/en/solution-3.html)

Launch Dam Optimal Operation System that Employs AI

The Hokuriku Electric Power Company (Hokuriku Electric) and JFE Engineering have been conducting since FY2017 a verification test of the Inflow Prediction AI*[1], which predicts water inflow into Asaida Dam. In FY2020, the two companies began jointly developing the Dam Optimal Operation System, which also incorporates Dam Optimal Operation AI for planning optimal dam and power plant operations based on the Inflow Prediction AI.

The Dam Optimal Operation System suggests when to open the discharge gates of a dam or a power plant based on dam inflow information obtained from the Inflow Prediction AI as well as the respective dam operation rules for each dam. This will eliminate wasteful discharge and facilitate the generation of more power.

Following the verification test conducted at Asaida Dam, the two companies expanded the application to five dams in the Jinzu River system owned by Hokuriku Electric (Asaida Dam, Shininotani Dam , and Jinzu River No. 1, No. 2, and No. 3 Dams) in FY2021 and began verifying the comprehensive optimization of the operation of all five dams. The results confirmed that if operators followed the AI's suggestions regarding operations, the amount of power generated by the hydropower plants in the Jinzu River system could be expected to increase by around 1% in total. Accordingly, the companies have begun to operate the Dam Optimal Operation System. Furthermore, since the Inflow Prediction AI and Dam Optimal Operation AI have been used to reduce floods*[2] caused by the early release of water from dams (under safe operation), a positive impact can be expected in flood control. We believe that the system will support local governments and dam managers while also helping to resolve regional issues. Going forward, we will incorporate cutting-edge AI technologies to keep the system advanced and evolving, and continue increasing hydropower generation as a source free of CO_2 emissions.

*1 A system that can make highly precise forecasts of inflows into a dam in the next 33 hours based on past rainfall and inflow data as well as rainfall predictions by the Japan Meteorological Agency.
*2 Strong river currents caused by a rapid rise in water levels resulting from heavy rain.

ASAIDA dam

- Launch Dam Optimal Operation System that Employs AI (Japanese only) (https://www.jfe-eng.co.jp/news/2022/20221019.html)
- Appendix to Launch Dam Optimal Operation System that Employs AI: Overview of Dam Optimal Operation System (Japanese only)
  (https://www.jfe-eng.co.jp/news/images/uploads/888bf12647816e2243755008371a0e1f7968f5af.pdf)
- JFE Engineering's Digital Transformation Strategy (WinmuSe®) (https://www.jfe-eng.co.jp/dx/en/solution-4.html)

Established the JFE Engineering Carbon Neutrality Collaborative Research Center with the Tokyo Institute of Technology

JFE Engineering and the Tokyo Institute of Technology opened the JFE Engineering Carbon Neutrality Collaborative Research Center (CRC) at the Institute's Laboratory for Zero-Carbon Energy under the Institute of Innovative Research on July 1, 2022. The purpose of the CRC is to promote new technologies for realizing a carbon-neutral society. The two parties are comprehensively and jointly working on technical developments in carbon neutrality, transcending the boundaries of a typical individual joint research framework to pursue a multilayered approach and generate innovation across the wide range of fields required for realizing a carbon-neutral society.

The CRC will promote the development of new technologies to help realize a carbon-neutral society by combining JFE Engineering's engineering technologies related to plant and infrastructure construction in the fields of energy and the environment with the Tokyo Institute of Technology's advanced academic knowledge in a wide range of areas.

CRC agreement signing ceremony on June 29, 2022

Laboratory for Zero-Carbon Energy, Institute of Innovative Research (Ookayama North No. 1 Campus)

➤ **JFE Engineering and Tokyo Institute of Technology establishes JFE Engineering Carbon Neutrality Collaborative Research Center (Japanese only)** (https://www.jfe-eng.co.jp/news/2022/20220629.html)

Realizing a Recycling-Oriented Society and Protecting the Marine Environment by Horizontally Recycling PET Bottles

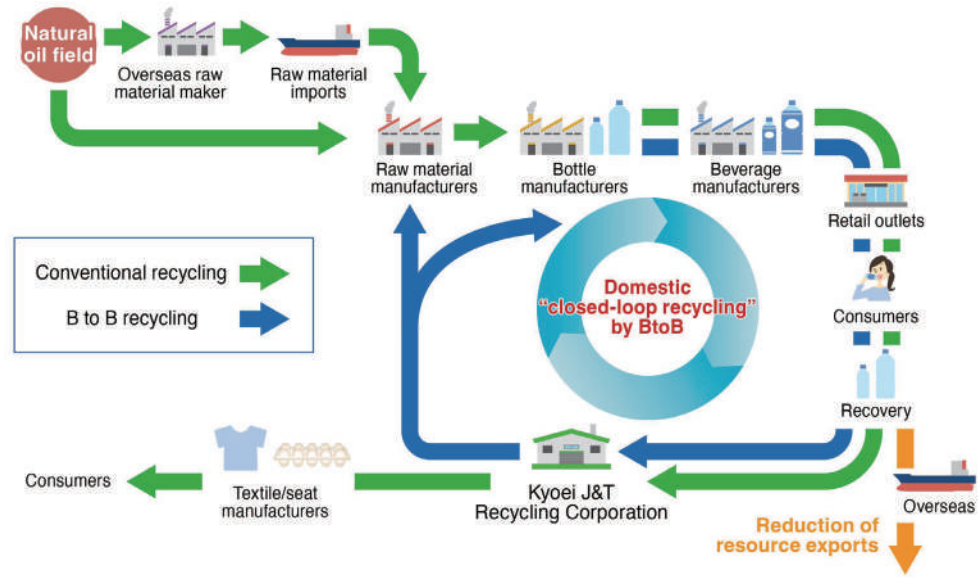
Following the launch of the PET flakes plant in October 2021, Kyoei J&T Recycling Corporation*1, a subsidiary of J&T Recycling Corporation*2, began the full-scale commercial operation of a pellet production line after its completion in April 2022. Through bottle-to-bottle recycling technology that facilitates the repeated recycling of bottles (horizontal recycling), CO_2 can be reduced by 63% compared to manufacturing the bottles from crude oil (based on a calculation by Mitsubishi UFJ Research and Consulting). The concept was introduced in White Paper on Manufacturing Industries (Monodzukuri) 2010, issued by the Ministry of Economy, Trade and Industry, as a case for responding to resource environment restrictions*3.

J&T Recycling endorses the activities of Japan Clean Ocean Material Alliance (CLOMA), an alliance for promoting initiatives to address the marine plastic waste problem, and engages in PET bottle and plastic recycling business as a member of CLOMA.

*1 Joint venture between J&T Recycling Corporation and Kyoei Industries Co., Ltd.
*2 Group company of JFE Engineering
*3 By Kyoei Industries Co., Ltd.

Photo of the whole plant

■ **Horizontal Recycling of PET Bottles**



- **Kyoei J&T Recycling Corporation Begins Full-scale Commercial Operation of West Japan PET Bottle MR Center (Japanese only)** (https://www.jfe-eng.co.jp/news/2022/20220421.html)
- **Establishment of Joint Venture Between J&T Recycling Corporation and Kyoei Industries Corporation—The Largest PET Bottle Recycled Resin Production Plant in Japan Contributing to the Shift to B to B (Japanese only)** (https://www.jfe-eng.co.jp/news/2020/20200507.html)

Overseas Infrastructure Businesses (Water Treatment Business in Southeast Asia)

JFE Engineering has formed a joint venture with Obayashi Corporation and other companies and was awarded the construction for a sewage treatment plant under the Jakarta Sewerage Development Project (Zone 1), which is supported by Japanese ODA loan, from the Directorate General of Human Settlements, Ministry of Public Works and Housing of the Republic of Indonesia.

In Indonesia's capital, DKI Jakarta , the population exceeds 10 million and sewerage coverage remains at 12%. Consequently, the installation of sewer pipelines and development of a sewage treatment plant are urgent priorities. The purpose of this project is to construct a sewage treatment plant in Zone 1, a particularly densely populated area consisting of many commercial facilities among the 15 sewerage zones under Wastewater Management Master Plan .

Given tight land restrictions, a drainage treatment technology using special film to filter (separate) drainage has been adopted to save space and enable high performance in water treatment, for constructing a sewage plant with a capacity of treating wastewater of 240,000 m^3/day. The project also became the first in Indonesia to adopt a cutting-edge construction method that has been used in Japan. By comprehensively undertaking the process from design to construction, we intend to export high-quality infrastructure.

Rendering of the completed project of Jakarta Sewage Treatment Plant (Zone 1)

Overseas Infrastructure Businesses (Expanding Overseas Bridge Business into West Africa)

JFE Engineering is strengthening its overseas business as part of its growth strategy up to 2030. Developing social infrastructure such as bridges in countries and areas experience population growth is essential for contributing to achieving the SDGs across the world. JFE Engineering has been engaging in many overseas bridge construction projects with a focus on Southeast Asia and South Asia. Looking ahead, areas further west, Africa, and North America, are under consideration as prospective markets. Various projects for national economic growth are underway, and JFE Engineering was awarded an improvement project for Tema Intersection, Phase II in Ghana and another improvement project for intersections in Abidjan, the Republic of Cote d'Ivoire. By developing proposals that reflect an understanding of the needs and fully applying its technical capabilities, JFE Engineering will successfully complete these projects and contribute to building a foundation for daily life and the industry in these countries and West Africa.

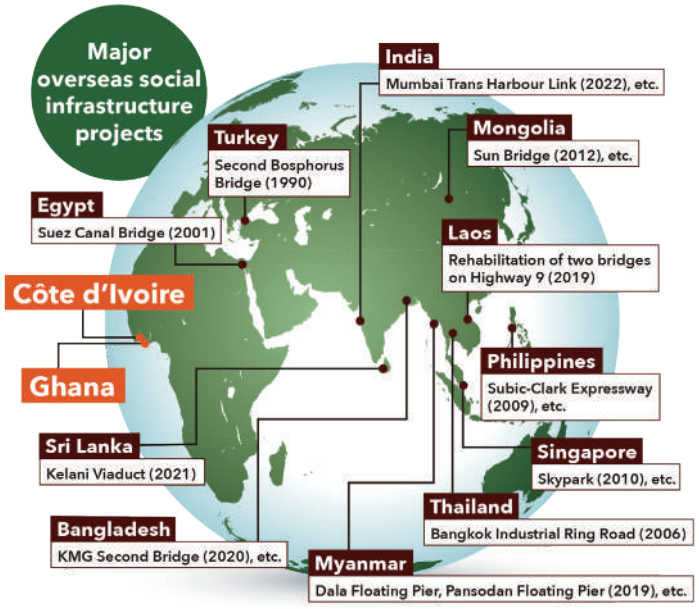
Order Received for the Phase II of Improvement Project of Tema Intersection in Ghana

Traffic has been increasing in Ghana along with the country's economic development, and severe congestion is occurring in major arterial roads in Accra, the capital. Since this project takes place in narrow urban sites, the construction period must be kept short to minimize the impact on existing traffic already suffering from congestion. Furthermore, many of Japan's excellent sustainable technologies, such as highly durable steel/concrete composite deck slab and steel with extended painted life for improved maintenance, were adopted, helping to mitigate the burden of maintenance and management going forward.

Order Received for an Intersection Improvement Project in Abidjan, Cote d'Ivoire

In Cote d'Ivoire's largest economic city, Abidjan, traffic congestion associated with aged and underdeveloped road infrastructure has become chronic. This project is intended to realize smooth traffic by constructing flyovers at the three intersections along the arterial road crossing the city and creating multilevel intersections. JFE Engineering proposed value engineering after reviewing the design within the scope of the project specifications, which will significantly cut construction cost and reduce CO_2 emissions associated with the project by adopting local standards and allowing flexibility in design.

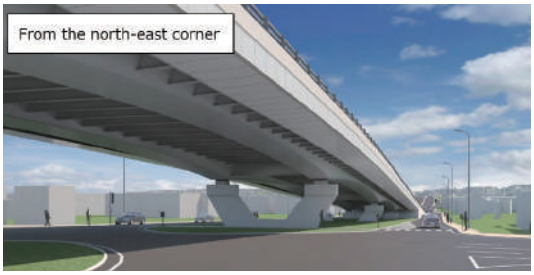
■ **Major bridge projects outside Japan**



■ **Rendering of the completed phase II project for the Tema intersection in Ghana**

Source: Japan International Cooperation Agency

■ **Rendering of the completed improvement project for the Palmeraie intersection, Abidjan, Cote d'Ivoire**



Source: Japan International Cooperation Agency

Contract Molding Business Using One of Japan's Largest Metal 3D Printers

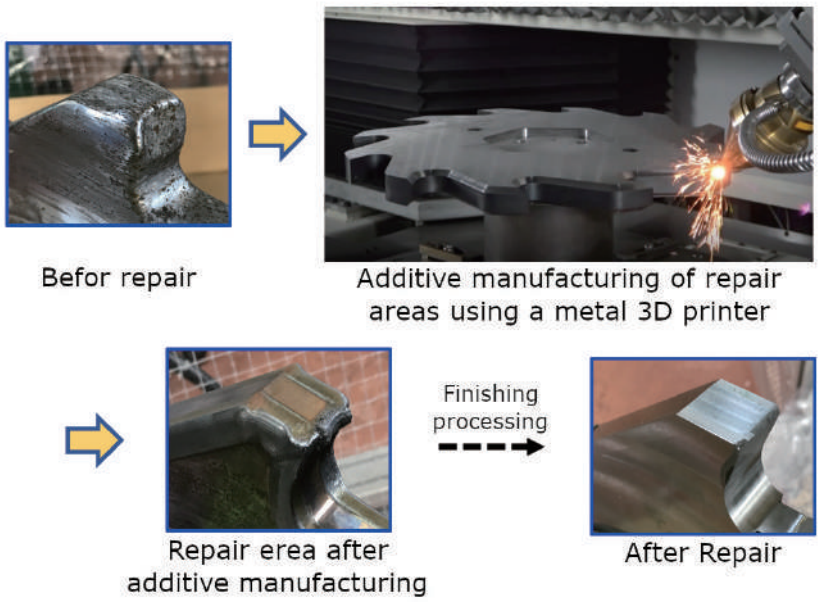
In 2022, JFE Engineering Tsurumi works started a contract molding business using one of Japan's largest directed energy deposition (DED)* metal 3D printers. The application of metal 3D printers has been rapidly rising, centering on aerospace and automotive fields. And demand for applications are broadly increasing in Japan as well for plants in key industries such as power, oil, gas, and chemicals, as well as in industrial machinery.

For example, while the casting process requires large amounts of power and time to create a mold and melt material, both power and time can be significantly reduced by forming a shape with layers of thin metal materials based on a 3D model using a 3D printer. The final shape can be formed in a single process using this method (near net shape manufacturing). Near net shaping manufacturing will also significantly boost yield, thereby reducing rare metal material loss.

The Tsurumi works has been manufacturing industrial machinery such as shield machines and steam turbines. We will combine the mechanical processing technology cultivated over the years with new manufacturing methodologies employing 3D printers to develop and promote the foundation of a new industry and drive technical innovation, in addition to developing manufacturing systems for new fields, including aerospace and automobiles. Furthermore, we are committed to preserving limited resources while realizing a sustainable society and supporting daily life, with due consideration for responsible production and consumption patterns.

* A type of 3D printing method; short for directed energy deposition. Under this method, 3D figures are made by irradiating a laser beam on metal powder and laminating by repeating the padding process of melting and solidifying.

■ **Usage example (repairing abrasion of a double axel shearing cutter. Base material: SKD61, repair material: SKH51)**



➤ Collaboration between JFE Engineering and Toray Precision Co., Ltd.—Establishing a Complementary Relationship in Molding Business Using Metal 3D Printer (Japanese only) (https://www.jfe-eng.co.jp/news/2022/20220523.html)

➤ Metal 3D Printer Contract Molding Service (Leaflet) (Japanese only)
(https://jfe-tsurumi.jp/wp-content/uploads/2022/09/20220802_リーフレット_金属3Dプリンター受託造形サービス.pdf)

JFE Shoji

Further Expanding the Global Supply Chain for the Steel Sheets Business

The key factor in initiatives for countering climate change, including those for reducing CO2 emissions, is minimizing electricity loss and using generated electricity without loss. Motors found in places such as power plants, factories and homes are responsible for 40–50% of all electricity consumed globally. In Japan, the ratio is approximately 60%. Improving the efficiency of motors by 1% in Japan would contribute to the equivalent of a 500,000 kW-class power generation plant in energy savings. Technological advances are expected in EV engine motors, for which demand is expected to rise during the transition to a decarbonized society, and as many as 50 to 100 other types of motors are installed per vehicle. We expect improvements in efficiency and further reductions in size and weight. In addition, in order to minimize energy loss while distributing electricity from source to factories and homes, continuous improvement in efficiency is required in transformers, where the most loss of electricity occurs.

JFE Shoji has established a stable global supply chain that includes sourcing high-quality electrical steel sheets which are essential for improving the efficiency of motors and transformers from JFE Steel and other manufacturers and processing the products for meeting customer needs. Customers who require high-quality electrical steel sheets, such as manufacturers of motors and transformers, typically operate manufacturing facilities across the globe. To align with this trend, the company has been expanding its electrical steel sheets supply chain based in a global quad-polar organization that includes Japan, America, China, and ASEAN. JFE Shoji is steadily taking action to capture demand, such as by reinforcing its stamping facilities at locations in and outside Japan to establish the world's number one global distribution and processing system for high-quality electrical steel sheets. By further expanding its supply chain and processing capabilities and collaborations with alliance companies, JFE Shoji is striving to significantly improve the distribution and processing of electrical steel sheets.

Building a Supply Chain for the Offshore Wind Power Generation Industry

Initiatives toward carbon neutrality are expanding around the world to tackle the shared issue of climate change. Japan has set its goal to achieve carbon neutrality by 2050 and formulated the Sixth Strategic Energy Plan in 2021 to lay out strategies to that end. These ambitious strategies include reducing greenhouse gas emissions by 46% in FY2030, boosting renewable energy in its electricity mix to 36–38%, and increasing the ratio of wind in the renewable energy mix to 5% (generating capacity of 23.6 GW) compared to the 0.9% (generating capacity of 4.5 GW) in FY2019.

As for offshore wind power generation, the industry is expected to expand, as targets were set to accept proposals to build 10 GW capacity by 2030 and 30–45 GW by 2040.

JFE Shoji is collaborating with a local enterprise that manufactures the windmill foundations in Taiwan, which is leading in the offshore wind power generation market, and have been achieving progress regarding supply chain of steel materials for foundation structures. Looking ahead, the company will capitalize on the knowledge acquired and contribute to the realization of carbon neutrality by establishing a supply chain that supports the domestic production of goods and the local economy while also meeting customer demand in the offshore wind power generation industry in Japan.

Expanding Business in Biomass Fuels

JFE Shoji imports palm kernel shells (PKS) to Japan from Malaysia and Indonesia and wood pellets from Southeast Asian countries as fuel supplies for domestic biomass power plants.

Not only are the PKS and pellets considered as carbon neutral fuel because they absorb CO_2 as they grow, but they are also part of a sustainable business model by replanting trees after harvest. Additionally, the company launched alternative fuel initiatives for exiting the use of coal as it strives to become an environmentally sound company.

PKS

Wood pellets

Expansion of Scrap Trading to Support the Development of a Recycling-Oriented Society

JFE Shoji engages in a recycling business for steel and aluminum scrap. Demand for steel scrap is particularly expected to grow in Japan and overseas as the global community advances toward carbon neutrality. JFE Shoji will contribute to building a recycling-oriented society by increasing scrap recycling across the globe.

Efficient Use of Resources

Basic Policy

Economic growth in emerging countries is intensifying the need to conserve non-renewable resources and prevent pollution. Iron can easily be separated and is thus highly recyclable. It can be recycled and reused to make other steel products infinite times (closed-loop recycling). The JFE Group is leveraging each Group company's strengths to enhance resource recycling through recycling co-products from iron and steelmaking, reducing waste at construction sites, and promoting the global recycling of steel scrap.

We continue to pursue efficient uses of resources in both the production and product/service phases of its businesses, through steel scrap recycling, biomass fuel production and waste-to-energy power generation.

Targets and Results

As we acknowledge that the efficient use of resources is a key environmental issue for manufacturers, we set high-level targets corresponding to the business of our Group companies and monitor the results. The Group companies have consistently fulfilled KPIs for material CSR issues every year up to FY2020 and established environmental practices. We continue to work on efficiently using resources toward the following high-level targets.

■ Targets and Results for FY2022 and Targets for FY2023

Operating Company	FY2022 Targets	FY2022 Results and Initiatives	FY2023 Targets
JFE Steel	Recycling rate of co-products: 99% or higher	Recycling rate of co-products: 99.5%	Recycling rate of co-products: 99% or higher
JFE Engineering	Recycling rate at construction sites ・Recycling rate of rubble: 99.5% or higher ・Recycling rate of sludge: 95.0% or higher ・Recycling rate of industrial waste: 85.0% or higher	Recycling rate ・Recycling rate of rubble: higher than 99.9% ・Recycling rate of sludge: higher than 99.0% ・Recycling rate of industrial waste: higher than 84.4%	Recycling rate at construction sites ・Recycling rate of rubble: 99.5% or higher ・Recycling rate of sludge: 95.0% or higher ・Recycling rate of industrial waste: 85.0% or higher
	Recycling rate of office recyclable waste (Yokohama head office): 98.0% or higher	98.7%	Recycling rate of office recyclable waste (Yokohama head office): 98.0% or higher
JFE Shoji	Global recycling of steel scrap ・Exceed FY2020 scrap trade volume (FY2024 target: +5% from FY2020)	Scrap trade volume: –14% from FY2020	Global recycling of steel scrap ・Exceed FY2020 scrap trade volume (FY2024 target: +5% from FY2020)

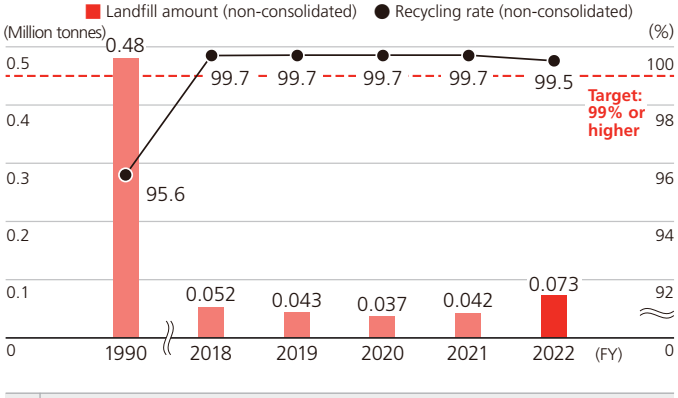
Initiatives

Reducing Generation and Emission of Co-products and Reusing Co-products

JFE Steel

JFE Steel carefully controls the generation and emission of iron and steelmaking slag (a co-product), iron dust from blast furnaces and converters, sludge from water treatment facilities, and other co-products by setting targets to improve recycling rates. Dust and sludge with high iron content are recycled as raw materials for steelmaking. Iron and steelmaking slag is effectively recycled for reuse in cement and other construction materials. The company is also promoting its use as environment recovery material such as Marine Stone™, which works effectively as a base for the adhesion of organisms and for improving the marine environment. As a result of these efforts, the company accomplished a 99.5% recycling rate for slag, dust, and sludge in FY2022, fulfilling the target of 99% or higher, and it is committed to consistently achieving the target.

■ Landfill of Co-products and Recycling Rates



Group companies*	Amount released	—	0.792	0.546	0.513	0.504	0.593	(Million tonnes)
	Amount transferred	—	0.029	0.031	0.023	0.054	0.094	(Million tonnes)

*22 JFE Steel consolidated subsidiaries in Japan.

For more quantitative data related to co-products, please refer to the following information.
➤ Environmental Data (P.225)

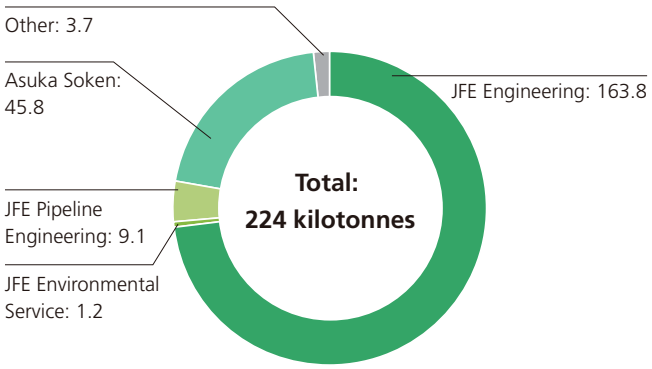
Promoting Recycling

JFE Engineering

Most of JFE Engineering's waste is either rubble and sludge discharged from construction sites or industrial waste discharged by the Tsurumi and Tsu works. The company is seeking to reduce industrial waste while also resource recycling through various measures, such as setting environmental goals for recycling rates and properly separating waste on-site before sending it to disposal companies known for achieving high recycling rates. It also complies with the Plastics Resource Circulation Act, enforced in Japan in April 2022, by including initiatives for plastics recycling in its environmental target.

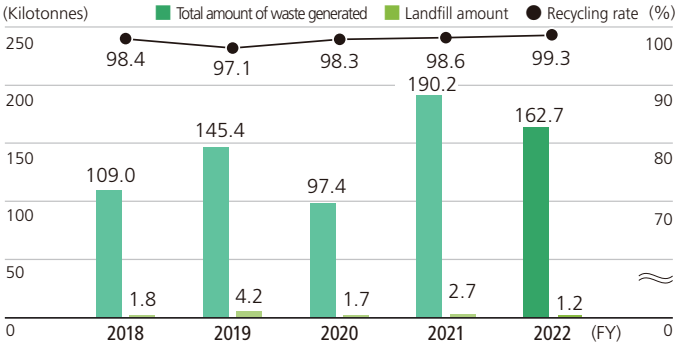
The Yokohama head office sets target recycling rates for office recyclable waste and maintains its efforts to reduce waste (encouraging double-sided copying), reuse (setting up collection boxes for plastic folders and plastic business card cases and recovering label printer cartridges), and recycle (thoroughly separating waste). The JFE Engineering Group is also helping to realize a recycling-oriented society through its PET bottle and food waste recycling initiatives.

JFE Engineering Group Waste Disposal for FY2022



*Data cover JFE Engineering and 11 consolidated subsidiaries in Japan.

Waste Generated at Construction Sites



For more on waste generated at the steelworks, please refer to the following information.

➤ Environmental Data (P.225)

Resource Recycling Solutions

The JFE Group is involved in establishing a recycling-oriented society through a variety of initiatives. Steelworks promotes the efficient use of raw materials, water, and other resources in the process of iron and steelmaking in addition to encouraging the application of recycled resources such as used plastics for blast furnaces. Moreover, we a striving to more efficiently use co-products generated in the iron and steelmaking process through initiatives such as the international recycling of steel scrap. By leveraging the highly recyclable quality of steel, we are also developing product that contribute to addressing the issue of plastic waste.

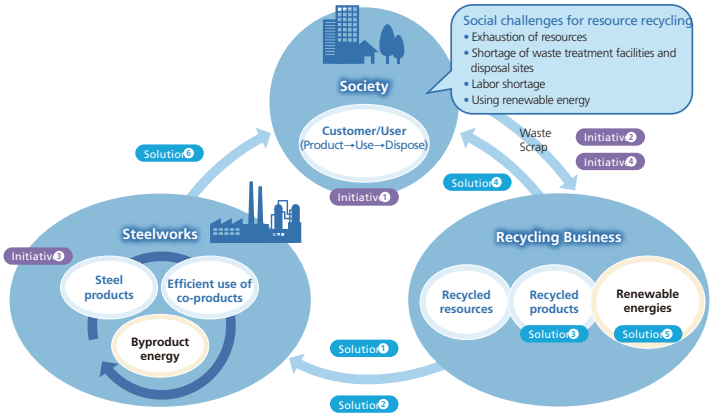
In the engineering field, we produce biomass fuel from food waste and sewage sludge, constructing plants, and other infrastructures for waste power generation and offer resource recycling solutions by operating these facilities directly or under contract. In addition, we are pursuing a circular economy by developing PET bottles and a plastics recycling business as well as an energy supplying business.

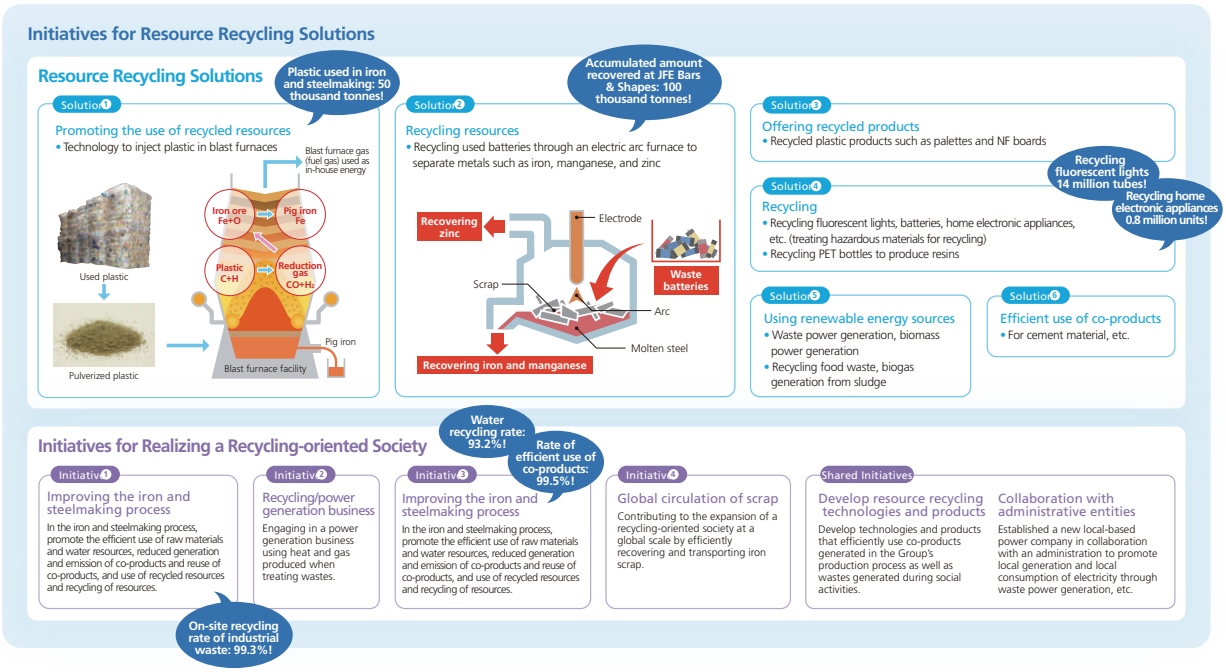
For JFE Steel and JFE Engineering's recycling businesses, please refer to the following information.

➤ **List of JFE Group's recycling businesses** (https://www.jfe-holdings.co.jp/en/csr/environment/resource/pdf/resource01.pdf)

For more on this, please refer to the following information.

➤ **Development and Provision of Eco-friendly Processes and Products** (P.108)
➤ **Environmental Communication** (P.152)





Reducing Plastic Waste Reduction by Manufacturing Cups from Highly Recyclable Steel

Under the logo Steelish™, a combination of "steel" and "stylish," JFE Steel is engaged in an initiative to expand the use of stylish, recyclable steel products that would introduce a change in daily lifestyles and help propel the global effort to tackle plastic pollution. For instance, JFE Steel proposes single-use steel cups as an alternative to disposable plastic cups. Steel cups are light and sturdy, with a thin rim that feels smooth against the lips, and they are able to keep drinks hot or cold for a long time, as well as being infinitely recyclable into other steel items and easier to recycle than plastic.

To this end, JFE Steel launched the project "BETTER RECYCLE Shonan" in 2021 and has since been involving customers in the development of disposable steel cups, the first time the company has adopted this approach. The project team, made up of members from IBLC Co., Ltd. and "Shonan Style" (a magazine published by EDITORS, Inc.) as well as JFE Steel, sought advice and cooperation from local governments and plastic disposable suppliers in the Shonan area and created a prototype for an eco-friendly disposable steel cup. The prototype and the Steelish™ initiative were presented at "Carnival Shonan 2022," an event held at the Kanagawa Municipal Tsujido Kaihin Park in November 2022 to explore turning the Shonan beaches into the first zero-waste beaches in Japan.

In March 2023, steel cups were used at "Nakame Challenge Cup 2023 ," an event hosted by Asahi YOU. US, Ltd. and the Nakame Area Management Association to eliminate disposable plastic bottles discarded by people viewing cherry blossoms in Nakameguro and raise awareness of plastic pollution, food loss, and other sustainability issues.

JFE Steel is committed to playing its part in fostering public awareness about climate change and plastic pollution issues and to achieving the SDGs by developing steel solutions that meet the needs of customers and society as a whole.

The Steelish® logo

The recyclable steel cup

➤ **Website on recyclable steel cups (Japanese Only)** (https://www.jfe-steel.co.jp/products/can/use/scene09.html)
➤ **BETTER RECYCLE Shonan (Japanese Only)** (https://www.jfe-steel.co.jp/products/can/pr/better_recycle_shonan.html)

Water Security

Basic Policy

The JFE Group uses large quantities of fresh water for cooling and cleansing products and facilities in its core business of steel manufacturing. For this reason, the efficient use of water resources with due consideration to the source of the water and stakeholders in the area is a key challenge. In response, we have established a system for reducing water intake by maximizing the use of recycled water at our steelworks. We will continue our efforts to reduce environmental impact by reducing water consumption through more efficient use.

And while we have always taken measures against meteorological disasters such as droughts and floods at our manufacturing sites in Japan, we are further reinforcing them in anticipation of the increased frequency and severity of weather events associated with climate change by securing alternative means and raising the height of embankments. We also seek to identify water-related risks throughout our business sites and supply chain in Japan and overseas, such as the risk of drought at the source of water intake and pollution at the point of discharge. In areas under water stress, we will respond appropriately through dialogue with stakeholders.

System

The JFE Group recognizes the issue of water resources as a risk that may significantly impact operations, and we have taken action against meteorological disasters such as droughts and floods. In recent years, we have been seeking to adequately identify and manage water risks based on the assumption that disasters due to climate change will increase in frequency and severity.

With regard to Group risk management, the Group Sustainability Committee, under the leadership of the CEO, who heads the JFE Group CSR Council, discusses, supervises, and guides Group-wide environmental initiatives, including the proper use of water resources.

There were no violations of environmental laws or regulations related to water quality in FY2022, and no fines or penalties were imposed.

Targets and Results

We acknowledge the use of water resources as a key environmental issue for manufacturers. Because the JFE Group uses large quantities of water in its core business of steel manufacturing, the Group sets high goals for water resource recycling. We defined KPIs for material CSR issues and consistently met them every year up to FY2020. This effort helped us to establish environmental practices. We will maintain our efforts to reduce water consumption toward the following high-level targets.

■ Target and Result for FY2022 and Target for FY2023

Operating Company	FY2022 Target	FY2022 Result and Initiative	FY2023 Target
JFE Steel	Maintain efficient use of water Recirculated water usage rate: 90% or higher	Recirculated water usage rate: 93.2%	Maintain efficient use of water Recirculated water usage rate: 90% or higher

Initiatives

Analyzing and Responding to Water Risks

As part of overall risk management, we identify, analyze and evaluate water risks based on past incidents of droughts and floods in the JFE Group's businesses, forecast data from the Meteorological Agency and results of our scenario analysis. In particular, we consider as key risks the damages to business sites and disruption of the supply chain caused by restrictions on water intake due to droughts or increasing severity of meteorological disasters. In response, we are further reinforcing measures such as using recycled water, securing alternative means, and strengthening drainage facilities.

Furthermore, to ensure the stability of our steel business's procurement throughout its supply chain, we are taking initiatives to reduce risks by evaluating them based on past data concerning water-related disasters and results of scenario analysis for materials such as coal and iron ore, securing alternative routes of procurement and diversifying suppliers.

JFE Steel

JFE Steel identifies and evaluates water-related risks based on past incidents of damage caused by droughts and floods, forecast data from the Meteorological Agency and results of scenario analysis. We conduct a further evaluation of water risks around each manufacturing site from different perspectives by also using the World Resource Institute (WRI)'s Aqueduct, a mapping tool for evaluating overall water risks from droughts and floods in each region around the world.

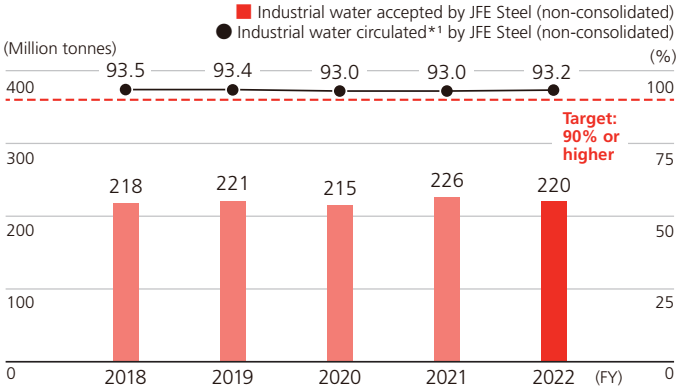
According to the WRI's assessment in May 2023, water risks for all of Japan are not designated at a high level or above, but there will be risks of water shortages and flooding due to weather conditions in the future (2030s and 2040s). JFE Steel identifies steelworks under such weather risks and takes measures such as business continuity planning.

Efficient Use of Water Resources

JFE Steel

A large amount of water is used in the iron and steelmaking process to cool facilities and process products. The target water recycling rate at JFE Steel is 90% or more, which is extremely high considering the amount evaporated when water is used. We are striving to improve the recycling rate by adopting purification processes such as biological and chemical wastewater treatments, and we have been successfully achieving the target. Our recycling rate of industrial water in FY2022 maintained a high level of 93.2%.

■ Industrial Water Accepted/Circulated



JFE Steel

Total amount	3,376	3,323	3,066	3,207	3,242	(Million tonnes)
Industrial water accepted	218	221	215	226	220	(Million tonnes)

Group companies*2

Total amount	289	293	265	235	233	(Million tonnes)
Industrial water accepted	20	20	21	19	18	(Million tonnes)

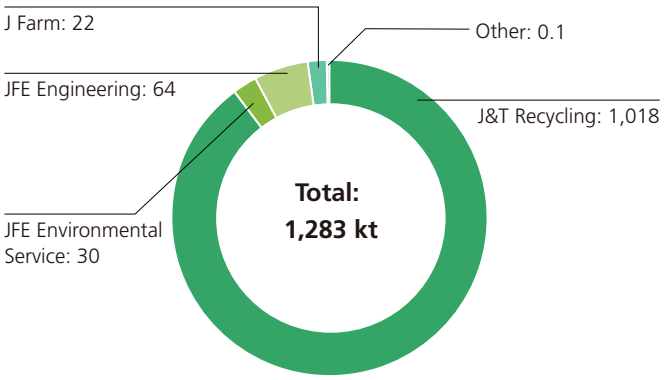
*1 Industrial water circulated (%) = (Total amount used – industrial water accepted)/total amount used ×100

*2 22 JFE Steel consolidated subsidiaries in Japan.

JFE Engineering

JFE Engineering and each Group company strive to use water efficiently at their business sites.

■ JFE Engineering Group's Water Consumption for FY2022



Data cover JFE Engineering and 7 consolidated subsidiaries in Japan.

For more on quantitative data related to water, please refer to the following information.

Environmental Data (P.225)

Prevention of Pollution

Basic Policy

The JFE Group regards co-existence and mutual prosperity with local communities, the global environment, and society at large as a critical managerial challenge in terms of business continuity. It strives to control air and water pollutant emissions and aggressively invests in environmental protection. Related internal controls and education are steadily being strengthened as well. Also, the transfer and widespread application of proprietary technologies, mainly in developing countries, contribute to pollution prevention on a global scale.

Management System

The JFE Group works to reduce environmentally hazardous substances generated from its business activities, takes actions to keep air, water, and other resources clean, and manages these matters Group-wide. In addition to management and supervision carried out by specialized committees set up at each operating company, operating companies' environmental management activities, including compliance with pollution prevention regulations, risk management, and implementing measures are reported to the Group Sustainable Committee, formed under the JFE Group CSR Council and chaired by the CEO of JFE Holdings, for Group-wide discussion, supervision, and guidance.

Targets and Results

Acknowledging the prevention of pollution as a key environmental concern for manufacturers, the JFE Group has set high-level targets to achieve and maintain the low emission of air pollutants generated from the steelmaking and other processes based on the action plan formulated by the Japan Iron and Steel Federation. Those targets were defined as KPIs for material CSR issues until FY2020 and were consistently met every year, while our efforts to achieve them enabled us to establish environmental practices. We continue to maintain the emission of pollutants at low levels and prevent environmental pollution toward achieving the following high-level targets.

■ Targets and Results for FY2022 and Targets for FY2023

Operating Company	FY2022 Targets	FY2022 Targets and Initiatives	FY2023 Targets
JFE Steel	Continue efforts to keep NOx and SOx emissions at low levels	Continuously maintained NOx and SOx emissions at low levels	Continue efforts to keep NOx and SOx emissions at low levels
	VOC emissions: –30% from FY2000 (1,078 t or less)	VOC emissions: –67% from FY2000 (513 t)	VOC emissions: –30% from FY2000 (1,078 t or less)
	Benzene emissions: –80% from	Benzene emissions: –93% from FY1999 (17 t)	Benzene emissions: –80% from FY1999 (46 t or less)
	Dichloromethane emissions: –40% from FY1999 (46 t or less)	Dichloromethane emissions: –68% from FY1999 (25 t)	Dichloromethane emissions: –40% from FY1999 (46 t or less)
JFE Engineering	Continue efforts to keep NOx and SOx emissions at low levels	Maintained low emissions as results were significantly less than the amount equivalent to the total annual volume restriction ・NOx : 126.6 Nm³ (18,000 Nm³) ・SOx : 41.6 Nm³ (100 Nm³)	Continue efforts to keep NOx and SOx emissions at low levels

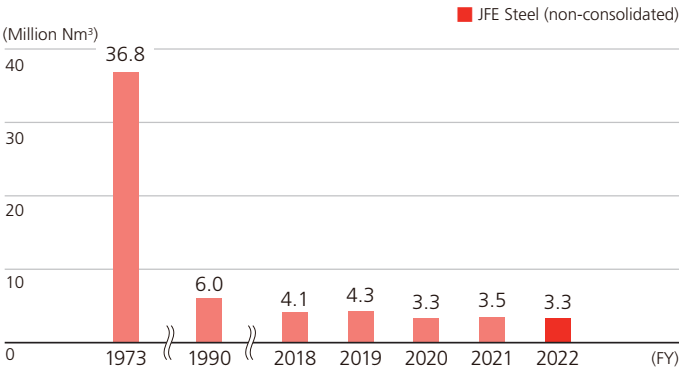
Initiatives

Controlling Air Emissions

JFE Steel

JFE Steel is installing low-nitrogen oxides (NOx) burners in reheat furnaces, switching to low-sulfur fuels and deploying desulfurization and denitration devices in sintering plants, all major sources of sulfur oxides (SOx) and NOx emissions. It has concluded agreements with local administrations that stipulate conditions that are stricter than the total volume restrictions required by the Air Pollution Control Law. The company is continuing to further control emissions at a level that is less than the amount set forth in the agreement. In addition, the company suppresses dust dispersion through measures that include enhancing on-site cleaning, installing sprinklers and windbreak fences in raw material yards, and improving the performance of dust collectors.

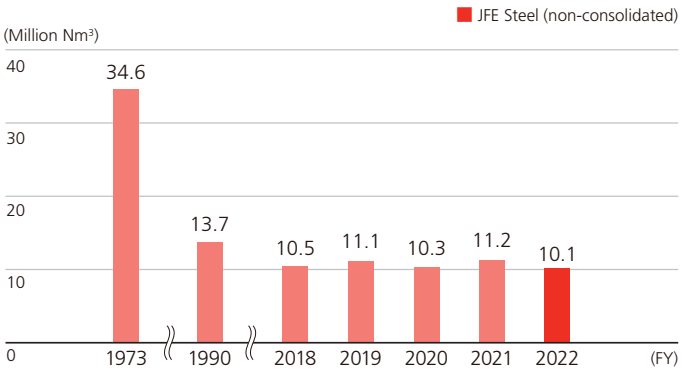
SOx Emissions



	1973	1990	2018	2019	2020	2021	2022
Group companies*	—	—	0.04	0.04	0.03	0.03	0.04 (Million Nm³)

*10 JFE Steel consolidated subsidiaries in Japan.

NOx Emissions



	1973	1990	2018	2019	2020	2021	2022
Group companies*	—	—	0.19	0.17	0.14	0.18	0.15 (Million Nm³)

*11 JFE Steel consolidated subsidiaries in Japan.

JFE Engineering

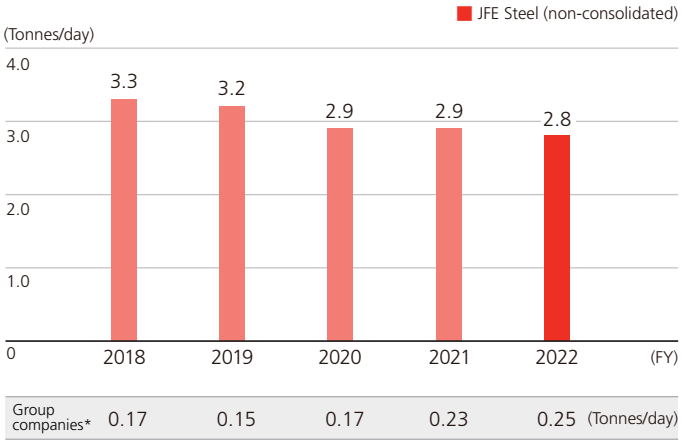
To ensure compliance with the Air Pollution Control Law and relevant local regulations, JFE Engineering properly manages facilities that emit soot and smoke at its Yokohama head office, Tsurumi works, and Tsu works, so NOx and Sox emissions from those facilities are maintained at a level sufficiently lower than the total annual volume restriction (NOx: 18,000 Nm³, Sox: 100 Nm3). In addition, efforts are being made at construction sites to protect the environment through the use of construction machinery and on-site vehicles in compliance with the Automotive NOx and PM Law and Act on Regulation, Etc. of Emissions From Non-road Special Motor Vehicles (Off-Road Vehicle Law).

Preventing Water Pollution

JFE Steel

JFE Steel strives to reduce its environmental impact on waterways by thoroughly purifying water used in iron and steelmaking processes before releasing it into public waterways or sewers. The company has concluded agreements with the administrative entity in each area that set out more rigorous effluent standards, compared to those stipulated under the Water Pollution Prevention Act. It also established a strict voluntary control standard to improve water quality. For FY2022, chemical oxygen demand (COD), the water-quality index for wastewater, was 2.8 tonnes per day.

Chemical Oxygen Demand (COD)



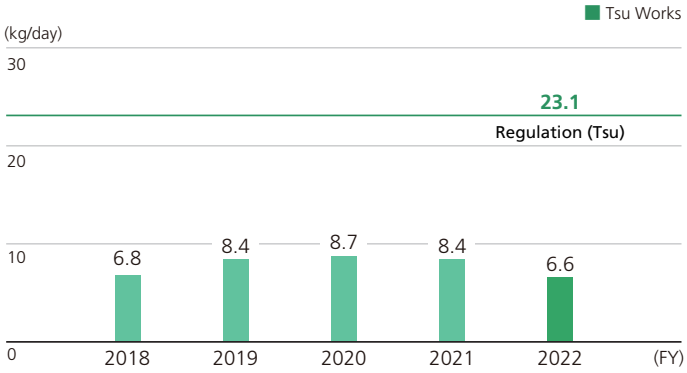
	2018	2019	2020	2021	2022	
Group companies*	0.17	0.15	0.17	0.23	0.25	(Tonnes/day)

*10 JFE Steel consolidated subsidiaries in Japan.

JFE Engineering

Wastewater from the JFE Engineering Yokohama head office, Tsurumi works, and Tsu works, is released into public waterways or sewer systems. Nitric oxide, phosphorus, and COD in the wastewater are measured on a regular basis and effectively managed in accordance with the Water Pollution Prevention Act and Sewerage Act.

Chemical Oxygen Demand (COD) in Wastewater Released Publicly



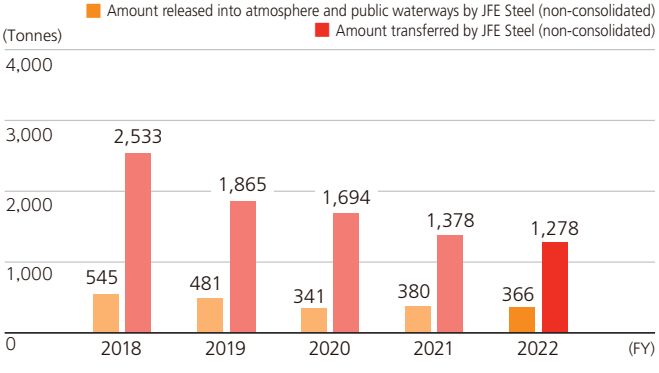
This report uses the maximum value of each year.

Management of Chemical Substances and Emission Control

JFE Steel

JFE Steel lowers its environmental impact by voluntarily reducing the chemical substances it releases. Release and transfer amounts of substances subject to Japan's Law concerning Pollutant Release and Transfer Register (PRTR Law) are reported in accordance with the law. In FY2022, chemical substances released into the atmosphere and public waterways totaled 366 tonnes.

Release and Transfer Amounts of PRTR-registered Substances at JFE Steel



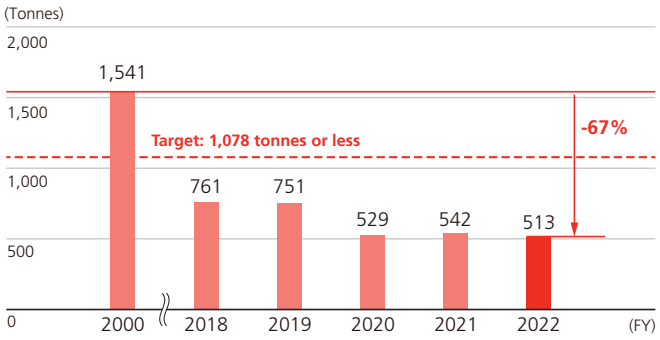
		2018	2019	2020	2021	2022	
Group companies*	Amount released	269	285	255	292	243	(tonnes)
	Amount transferred	6,643	5,967	4,216	8,433	11,501	(tonnes)

*15 JFE Steel consolidated subsidiaries in Japan.

The Japan Iron and Steel Federation formulated a voluntary action plan to reduce VOC emissions by 30% from FY2000 levels by FY2010. As part of this action plan, JFE Steel set a target for reducing emissions to 1,078 tonnes or less. As a result of our initiatives, we achieved a significant reduction that exceeded the 30% reduction target in FY2010 and have been consistently cutting VOC emissions, by more than 50%. Going forward, we will continue to maintain the emissions below 1,078 tonnes

and take the necessary steps to prevent any increase.
Emissions of benzene and dichloromethane are kept at low levels. We will continue to set targets for the two substances and maintain low emissions levels.

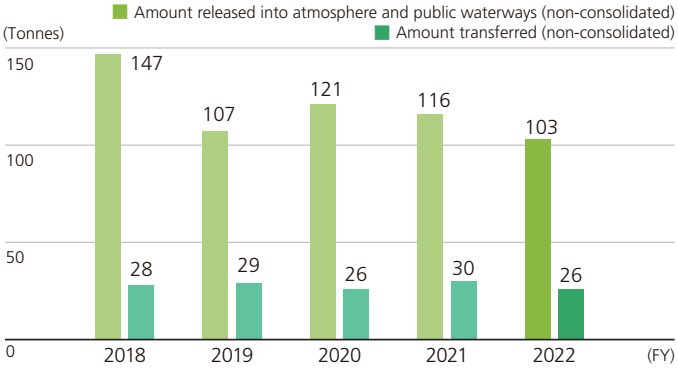
■ VOC Emissions



JFE Engineering

Major chemical substances subject to the PRTR Law for the JFE Engineering works in Tsurumi and Tsu include organic solvents such as xylene used for painting products, manganese and its compounds generated during welding. We report the release and transfer amounts of these substances in accordance with the law.

■ Release and Transfer Amounts of PRTR-registered Substances at JFE Engineering



Group companies*	Amount released	—	45.4	36.7	39.3	37.8	(tonnes)
	Amount transferred	—	5.4	12.5	4.4	4.4	(tonnes)

*4 JFE Engineering consolidated subsidiaries in Japan.

For more on quantitative data related to PRTR, please refer to the following information.

➤ Environmental Data (P.225)

PCB Waste Management at JFE

Polychlorinated biphenyl (PCB) waste is properly stored and managed at the JFE Group's facilities. High concentration PCB waste is treated in accordance with guidelines set by the Japan Environmental Storage & Safety Corporation (JESCO). The Yokohama Eco Clean Plant of J&T Recycling Corporation treats insulating oil contaminated with slight amounts of PCB, helping to reduce pollutants both in and outside the JFE Group.

Biodiversity

Basic Policy

Recognizing that natural capital and biodiversity are foundational for realizing a sustainable society, the JFE Group has endorsed the Declaration of Biodiversity by Keidanren and Action Policy and conducts business in harmony with nature across the world. We particularly recognize the preservation of biodiversity as a key challenge and conduct assessments to minimize the ecological impact associated with our business activities. Our initiatives include cooperating with the community to monitor biodiversity and carry out preservation activities around the steelworks, the key facilities for our business, and in surrounding areas. We are also involved in developing iron and steelmaking slag products that can help restore the marine environment. Furthermore, beyond our business operations, we launched a joint research program with a local government and conduct environmental education for local communities.

➤ Declaration of Biodiversity by Keidanren and Action Policy (Revised Edition) (https://www.keidanren.or.jp/en/policy/2018/084.html)

Initiatives

Risk and Opportunity Assessment in Line with the LEAP Approach

The JFE Group began pilot testing the LEAP approach in line with the recommendations of the Taskforce on Nature-related Financial Decisions (TNFD), starting with JFE Steel's leading manufacturing sites and its upstream operations at external mining sites in major source countries for iron ore and coking coal. We will increase our understanding of relationships between nature and the Group toward the disclosure of material risks and opportunities in accordance with the TNFD framework.

■ Progress in pilot LEAP assessment

Locate

Identifying the organization's interface with nature
We have been carrying out a LEAP pilot at our leading manufacturing sites and mining sites in major source countries for iron ore and coking coal to locate priority sites that should be subject to the assessment and disclosure of nature-related risks and opportunities. Through the use of IBAT, Resource Watch, and other TNFD-recommended tools, we have identified locations falling under the five TNFD criteria, i.e., areas with high ecosystem integrity, areas characterized by rapid decline in ecosystem integrity, areas of biodiversity importance, areas experiencing water stress, and areas in which the organization is likely to have significant dependencies and impacts.

Evaluate

Evaluating dependencies and impacts
Through the use of ENCORE and other TNFD-recommended tools, we will evaluate, on a trial basis, which of our business operations has significant dependencies and impacts on nature. In addition, we will use our in-house environmental data to increase our understanding of relationships between nature and our business.

Assess

Assessing nature-related risks and opportunities
Based on the findings from the evaluation of our dependencies and impacts on nature, we will identify and assess nature-related risks and opportunities for our business.

Prepare

Preparing to respond and report
We will prepare to respond to and disclose findings from the assessment of dependencies, impacts, risks, and opportunities.

Initiatives to Preserve Biodiversity

JFE Steel

Environmental Impact Assessment

To minimize the ecological impact of our business activities on surrounding areas, we are monitoring biodiversity around all of our business sites and planting trees while also preserving rare species in the compound. An environmental impact assessment is conducted in accordance with laws and regulations before launching construction of a new manufacturing site or business. We assess the biodiversity of the surrounding areas as well as our premises to fully understand the situation and to implement the necessary measures for preserving the ecosystem.

Replanted a Rare Species of Orchid Found at a Planned Construction Site

Plant No. 1 in the JFE Ohgishima Thermal Power Plant, an aging facility, was renovated and resumed operations in 2019. Before this construction, we conducted an environmental prediction and evaluation for the renovation, in accordance with the Environmental Impact Assessment Act and Electricity Business Act. As a result, the Kugenuma orchid, a plant listed in Japan's Ministry of Environment's fourth version of the Red List as an endangered species (Threatened II- Vulnerable, VU), was discovered at the planned construction site for power generation facilities. To preserve the orchids, we replanted them in a different location of the site that had a similar environment.

A Kugenuma orchid discovered at the planned construction site for the JFE Ohgishima Thermal Power Plant

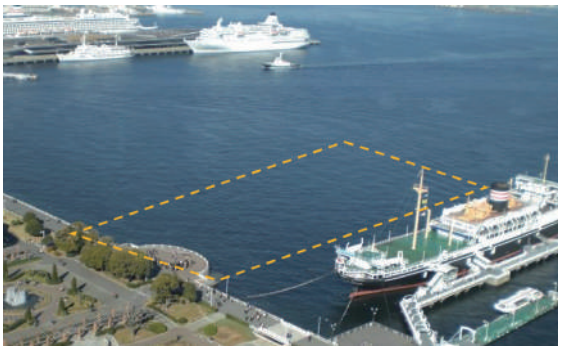
Contributing to Biodiversity and the Creation of an Attractive Seaside Town by Utilizing Steel Slag Products (Partnership Agreement with Yokohama City)

Silty sediment (sludge containing large amounts of organic matter) piles up at the ocean bed along the seaside frontage of Yamashita Park in Yokohama City, Kanagawa Prefecture, and significantly deteriorates water quality in summer. As a result, the ocean's ability to function as a spawning ground or environment for nurturing organisms has been lost. In a joint research project with Yokohama City, JFE Steel is restoring the intrinsic ability of the waters to purify seawater with the help of marine organisms by using carbonated steel slag products such as Marine Block™ to form shorelines as a base for the adhesion of organisms and assist in improving the marine environment. Immediately after an experiment, we observed an increase in the presence of marine organisms such as starfish and sea cucumbers around the area, and the populations continuing to grow. Moreover, we estimated that 8,400 kl of seawater (equivalent to seventeen 25-meter swimming pools) is filtered per day by filter-feeding marine creatures such as bivalves and sea squirt. We also estimated their impact on the removal of COD*1 and the reduction of CO_2 in comparison to results obtained through water purification at sewage treatment plants.

The findings from the research project were presented at many exhibits and other events, helping to raise local awareness of environmental protection. This public-private research project for improving the marine environment has earned public recognition, with Yokohama City and JFE Steel jointly receiving the FY2021 Environmental Award (Group-2) of the Japan Society of Civil Engineering*2. In September 2022, JFE Steel won the Minister of Land, Infrastructure, Transport and Tourism Award of the 5th Eco Pro Awards*3, sponsored by the Sustainable Management Promotion Organization , a general incorporated association.

*1 COD stands for chemical oxygen demand, an indicator for water pollution in seas, oceans, lakes, and ponds. It represents the amount of oxygen (mg/l) consumed when pollutants present in water, such as organic matter, are oxidized.
*2 The Japan Society of Civil Engineering Award is a prestigious award with a history of over 90 years. The Environmental Award (Group-2) is given to an innovative project that has contributed to any combination of environmental preservation, improvement, and creation activities by developing or operating civil engineering technology or systems.
*3 The award is given to goods, services, technology, solutions, or business models with specific and outstanding eco-friendly attributes that are widely recognized by businesses, consumers, investors, and market players in the Japanese market.

➤ **FY2021 Environmental Award of the Japan Society of Civil Engineering** (https://www.jsce-int.org/node/780)
➤ **The 5th Eco Pro Award (Japanese only)** (https://sumpo.or.jp/seminar/awards/5th_eco-pro_award_results.html)



The dotted line indicates the area in which slag products are being used at Yokohama Bay (photo taken by Yokohama City)

Colony of sea squirts on Frontier Rock™

Marine Block™ covered by marine bivalves (Yokohama Bay area)

Advancing Biodiversity Verification of Steel Slag Products in Collaboration with Venture Businesses

JFE Steel keeps a water tank containing the coral-covered steel slag product Marine Block™ at the exhibition area at the reception of the head office, offering visitors the opportunity to enjoy watching coral and tropical fish while learning about our initiative to preserve the ecosystem using steel slag products. We also intend to conduct experiments inside the tank. Innoqua Inc.* is providing technical support for the exhibition, which has been featured by several newspapers and TV programs as an example of business collaboration in the field of the environment.

*A venture company engaged in the development of systems for managing and nurturing corals and fish by combining its aquarist know-how with IoT and AI.

Healthy coral growth on Marine Block™ inside the water tank

Firefly Festival

JFE Steel has opened its Environment Pond at the Chita Works to the community for a firefly viewing festival every year since 2014. Children at the event have the opportunity to release fireflies. The Company is nurturing an environment that preserves the ecosystem together with the local community by maintaining the watering holes and surrounding environment within the steelworks site and these firefly viewing events.

Releasing firefly larvae

Stream within the Chita Works site where fireflies are released

Firefly viewing party

The Chita Works Certified as an Aichi Biodiversity Company

In November 2022, our Chita Works was recognized as a certified enterprise under the Aichi Biodiversity Company Certification Program in its first term launched by Aichi Prefecture based on the Aichi Biodiversity Strategy 2030 . The program is intended to encourage more businesses in the prefecture to play a pivotal role in preserving local biodiversity by certifying those that have implemented outstanding initiatives to do so.

Certified
Aichi Biodiversity Company

The Chita Works is working with academia and the public sector, including the local community and nursery schools and kindergartens, to release firefly larvae in the stream running through the site and help them gain a foothold, apart from holding firefly viewing festivals for local residents. Since FY2022, the Chita Works has also exchanged information about the migration of the chestnut tiger butterfly, a species that travels more than 2,000 kilometers across Japan, with municipalities on the Chita Peninsula in Aichi Prefecture. The compound of the Chita Works is filled with thoroughwort and other plants to make it green for the butterflies. The works will continue to take on more initiatives for biodiversity preservation while strengthening its cooperation with the local community.

JFE Engineering

Initiatives in Relation to Construction Works

For large-scale construction or construction work carried out near watersheds or mountainsides, customers and/or the relevant authorities may conduct preliminary investigations depending on the importance of preserving the surrounding environment. Various preservation conditions may then be required, including the protection of living creatures.

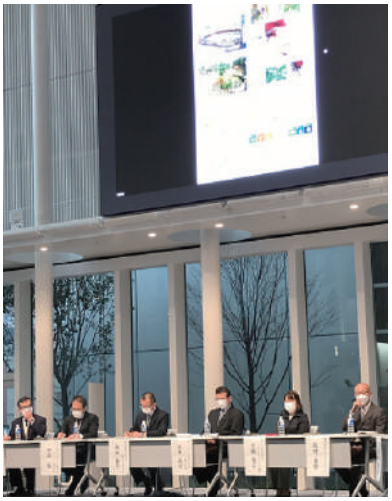
JFE Engineering respect the proposed conditions and thoughtfully consider biodiversity preservation by keeping the impact of construction works at a minimum. For example, the company may propose a construction method that minimizes the impact of noise or drainage pollution. For its steelworks, the status of biodiversity on its premises and in surrounding areas are checked, and necessary measures are taken to ensure preservation.

Biotope for Children's Learning Experience

JFE Engineering has conducted some renovation work at the JFE Dragonfly Path in the Tsurumi Works, and since 2009 it has been inviting children in the community to learn about the ecosystem at a biotope, Dragonfly Pond, located along this path. In 2022, the JFE Dragonfly Path Fan Club, a group mainly composed of neighborhood residents, organized a research event that involved capturing dragonflies in order to learn about their ecology and the local environment.

Furthermore, JFE Engineering has been a co-sponsor of the How Far Do Dragonflies Fly since FY2020, with the aim of improving the quality of green spaces in the Keihin coastal areas and contributing to biodiversity. The forum brings together companies, residents, governments, and experts and conducts research activities such as capturing dragonflies that fly in 15 green spaces and biotopes scattered throughout the Keihin Coastal Area and inland areas, tagging them, releasing them, and tracking their movements. The JFE Dragonfly Path also serves as one of the research sites. This forum celebrated its 20th anniversary in 2022, and JFE participated in a panel discussion at the commemorative event at Yokohama City Hall and exchanged opinions with other companies.

Dragonfly Pond serving as biotope



The event celebrating the 20th anniversary of the How Far Do Dragonflies Fly Forum

Participation in Kanagawa Prefecture's Reforestation Partner Program

In March 2023, the JFE Engineering Group's J&T Recycling Corporation expressed its support for the Kanagawa Reforestation 50 Year Plan and signed a memorandum of understanding with Kanagawa Prefecture on the Reforestation Partner Program*, an initiative launched by the prefecture.

The company's intent is to use the program as part of its environmental protection and harmony activities while supporting the prefecture's vision. Under the partnership, the company's employees volunteer to help thin trees and take part in other efforts for conserving forests, a valuable source of water for future generations. In May 2023, 18 employees who joined the company in April helped prune trees at the Municipal Forest for the 21st Century located in Ashigara, Kanagawa Prefecture, and learned firsthand the importance of environmental preservation and volunteering.

The Reforestation Partner Program grants naming rights to participants for parts of the prefecture-owned forests, one of which is now called the J&T Kankyo Miracle Forest (with the word "miracle" expressed in kanji, meaning the "future is coming") . J&T Recycling Corporation is constantly enhancing its ESG initiatives to improve the environment.

New employees pruned trees in a volunteer activity

J&T Kankyo Miracle Forest

Valuation report on CO_2 absorption by the forest

*For details about the Reforestation Partner Program, please refer to:

➤ **Website for Kanagawa Prefecture (Japanese Only)** (https://www.pref.kanagawa.jp/docs/pb5/partner.html)

Endorsing and Participating in External Initiatives

As a member of the Keidanren Committee on Nature Conservation, the JFE Group endorses the Declaration of Biodiversity by Keidanren and Action Policy and actively engages in the conservation of nature and biodiversity. In addition, the Group took part in the Business for GBF Project, launched by the Ministry of the Environment and Keidanren Committee on Nature Conservation. JFE Steel's steel slag product was selected by the Ministry and Keidanren and introduced as an example of an initiative that contributes to the conservation of biodiversity. Going forward, we will deepen our understanding of and contribute to the Post-2020 Global Biodiversity Framework and other global initiatives committed to preserving nature and biodiversity.

For further details on external initiatives, please refer to:

➤ **Business for GBF Project, Ministry of the Environment** (https://www.biodic.go.jp/biodiversity/private_participation/business/en/)

Products and Technologies (Preserving Biodiversity)

The JFE Group endorses and participates in the Challenge Zero initiative that is being jointly sponsored by Keidanren and the Japanese government. And we are collaborating with Yokohama City on a project that uses steel slag to improve the marine environment while also developing various products aimed at conserving biodiversity.

For more on products and technologies related to environmental protection, please refer to the following information.

➤ **Development and Provision of Eco-friendly Processes and Products** (P.108)
➤ **Challenge Zero** (https://www.challenge-zero.jp/en/member/34)

Environmental Communication

Basic Policy

The JFE Group gives utmost priority to communicating with all stakeholders, including in matters relating to the environment. In addition to disclosing environmental information, the Group carries out extensive two-way communication between the public and the business community by supporting and participating in environment-related activities outside the Group.

Initiatives

Disclosing Environmental Data

The East Japan Works of JFE Steel discloses real time environmental data on local air and water quality. Visitors can review this information in the first-floor lobby of the Visitor Center in the Chiba District and in the Amenity Hall and the first-floor lobby of the Keihin Building in the Keihin District.

Environmental data display in the Keihin District

Environmental data display in the Keihin District

Commercial Video and Special Website about JFE

We created a commercial video and special website featuring the JFE Group's initiatives for a sustainable future to bring the Group closer to stakeholders. The video and website are titled "Sus-tetsu-nable!" with the word "tetsu" meaning iron inserted into the word "sustainable." We hope that the video and website will help the public better understand iron as an essential element for social infrastructure and recognize the Group's efforts as an indispensable member of society.

➤ Special website "Sus-tetsu-nable!" (Japanese Only) (https://www.jfe-holdings.co.jp/sus-tetsu-nable/)

ecobeing Environmental Website

The JFE Group provides support to ecobeing, a web magazine operated by KLEE INC., which disseminates information on the environment under the slogan, "Let's talk more with the Earth!" The website series, ecopeople, has featured people from a variety of fields and also introduced JFE Group employees and initiatives. In 2022, the magazine covered JFE Steel's BETTER RECYCLE Shonan, featuring the project for addressing plastic pollution by increasing the application of steel sheets for can-making along with those involved in the project in and outside the company, among other environmental initiatives beyond the JFE Group. By supporting this website magazine from an objective standpoint, the JFE Group seeks to help stimulate public discussion and awareness about ESG and the SDGs.

Please see the following for further details.

➤ **ecobeing (Japanese only)** (https://www.ecobeing.net/)

➤ **BETTER RECYCLE Shonan (Japanese only)** (https://www.ecobeing.net/ecopeople/2022_summer/04.html)

Sponsoring Midori no Komichi Environmental Diary

The JFE Group sponsors the Midori no Komichi (Green Trail) environmental diary project hosted by Green Cross Japan with the hope that children will become more aware of environmental issues by keeping diaries of their activities and thoughts about ecology.

Please see the following for further details.

➤ **Midori no Komichi Environmental Diary (Japanese only)** (https://www.midorinokomichi.net/)

Participation in Environmental Exhibitions Such as EcoPro2022 and Tokyo Bay Festival 2022

The JFE Group's business activities for protecting the environment have been presented at various environmental exhibitions.

In December 2021, the JFE Group participated in one of the largest environmental exhibitions in Japan, EcoPro2022, held at Tokyo Big Sight. Under the theme, "For a Prosperous Global Future—the JFE Group Collective Efforts to Address Climate Change," we displayed our initiatives for reducing CO_2 emissions in the steel business as well as technologies, mainly in engineering, that help reduce emissions across all of society. Many people, predominantly elementary and junior high school students, visited our booth to observe the Group's climate change initiatives by watching videos and using models to gain hands-on experience.

In 2022, JFE Steel received the Minister of Land, Infrastructure, Transport and Tourism Award of the 5th Eco Pro Awards, sponsored by the Sustainable Management Promotion Organization (a general incorporated association) for "Creating a Rich Sea through Public-Private Partnership: Improved Quality of Waters with a Steel Slag Product and an Initiatives for Environmental Education," a joint project with Yokohama City, and the award ceremony was held at EcoPro2022.

The JFE Group's booth at EcoPro2022


The event drew many children as well as adults.

The JFE Group's eight companies jointly participated in the 11th WIND EXPO at Tokyo Big Sight in March 2023. The WIND EXPO is one of the Smart Energy Week expos, a set of simultaneous expositions about seven new energy fields, and Japan's largest wind energy exposition. Our involvement in the WIND EXPO provided an opportunity to display the Group's expertise in various categories in relation to offshore wind power generation from foundation structures, construction, and O&M (operation and maintenance) to supply chains while deepening relationships with a wide range of visitors. We will continue to encourage efforts in the offshore wind power generation business and win more orders.

JFE Group's booth at WIND EXPO

In October 2022, JFE Steel took part in Tokyo Bay Festival 2022: SDGs and Tokyo Bay, an event held in Yokohama City to appreciate the bounty of Tokyo Bay, and presented the company's involvement in the regeneration of the marine environment and contribution to biodiversity through its steel slag products. The event was held in person for the first time in three years and offered a great opportunity for the company to showcase to the many visitors how its products contribute to the SDGs.

JFE Steel's booth at Tokyo Bay Festival 2022

Society: Executive Summary

The mission of the JFE Group is to establish its position as a company that is essential for the sustainable development of society and to create safe, comfortable lives for people everywhere. Through our efforts to address social issues, such as investing in human capital by ensuring occupational safety and health and recruiting and nurturing diverse human resources, and by respecting human rights across the supply chain, we intend to achieve the sustainable growth of the Group and become an entity that continues to develop and provide safe, high-quality products and services based on our leading technologies.

The key measures of our Seventh Medium-term Business Plan include safety and health management, the active participation of human resources, respect for human rights throughout the supply chain, and contribution to local communities.

Ensuring the well-being and safety of our employees is the foundation of our continued existence as a company, and we are committed to creating a safe work environment by adhering to the philosophy of safety first. To achieve our top-priority goal of zero major accidents, we are bolstering our capital investments and safety education programs while utilizing multifaceted occupational employee health and safety services, including monitoring and detection, that incorporate advanced IT solutions.

In recruiting and nurturing diverse human resources, we hire diverse human resources, fostering those who serve as the backbone of our business, create workplace environments and systems for employees to fully demonstrate their abilities with a sense of fulfillment, and realize new workstyles not restricted by time or location.

With the belief that respect for human rights is foundational for business as well as a corporate social responsibility, we have been taking action to realize a society in which human rights are respected and protected. We have been conducting human rights due diligence since FY2021 in accordance with the United Nations Guiding Principles on Business and Human Rights. In April 2023, we revised the JFE Group Human Rights Basic Policy in light of recent changes in awareness and issues related to human rights. We will continue to promote Group-wide efforts as well as seeking cooperation from all stakeholders including our supply chain to respect and protect human rights. Regarding contribution to local communities, it is important to cooperate and collaborate with society as we carry out our corporate activities globally. By actively contributing to those communities, we hope to achieve sustainable growth for both our businesses and society at large.

Targets and Results for Material Issues of Corporate Management Concerning Society (Materiality)

➤ Material Issues of Corporate Management and KPIs (P.20)

Key Initiatives

- To achieve our goal of zero major accidents, particularly in terms of **prioritizing safety investments** (P. 165) (around 10 billion yen per year Group-wide) to reduce risks by making workplaces inherently safe and also promote **multifaceted occupational employee health and safety services, including monitoring and detection, by harnessing advanced IT solutions** (P. 165).
- Proactively promote **mental healthcare** (P. 168) in addition to **maintaining and improving the mental and physical health of employees and their families** (P. 168), by, for example, creating an environment that supports employee physical health and medical checkups for their spouses.
- Promote a **new workstyle** (P. 174) by promoting teleworking and a flexible working hour program.
- Implement a broad range of initiatives **to promote diversity**, such as active recruitment and development of female employees (P. 178), enhanced childcare-support programs that significantly exceed statutory requirements, and training and education.
- Roll out **human rights due diligence** (P. 186) and consider initiatives to identify and address human rights risks for the JFE Holdings and major Group companies during FY2021. In FY2022, we revised the JFE Group Human Rights Basic Policy, advanced preliminary studies for the risk identification surveys of suppliers, and expanded risk identification surveys at Group companies in Japan. Starting in FY2023, we will expand the human rights risk management system for suppliers and conduct risk identification surveys at Group companies in Japan and overseas.
- **Actively promote DX** (P. 158), including the active introduction of IoT, AI, and data science, and the application of data assets.

Responsibility to Customers (Provide Quality Products and Enhance Customer Satisfaction)

Basic Policy

Under its corporate philosophy of contributing to society with the world's most innovative technology, the JFE Group will continue to be a company that provides world-class products and services for a prosperous global future.

JFE Group Standards of Business Conduct

1 Provide quality products and services

Earn the trust and acclaim of customers by endeavoring to provide safe, high-quality products and services based on superior technologies, and by fully respecting and protecting the privacy of personal and customer information. Also, leverage our superior technologies for the sustainable growth of our Group and society.

Targets and Results

Under its Standards of Business Conduct to provide quality products and services, the JFE Group has identified increasing efficiency and enhancing cost competitiveness in production and engineering and raising quality of products and services and ensuring reliable supply as two key management concerns and sets KPIs to manage progress and promote relevant initiatives.

➤ Material Issues of Corporate Management and KPIs for FY2022 (P.20)

Initiatives

JFE Group's Quality Initiatives

The JFE Group manages quality by ensuring compliance with quality standards set by each operating company. All manufacturing sites that require ISO 9001 certification for their quality management have been duly certified.

Strengthening Quality Assurance System

JFE Steel

To serve customers by meeting their quality requirements and delivering products that boast the world's highest quality, JFE Steel has established a quality assurance system with advanced sensors for process monitoring, in addition to its ongoing efforts to develop new products and advanced manufacturing technologies.

The company's quality assurance system is continually improved based on the Guidelines for Enhancing Quality Assurance Systems, issued by the Japan Iron and Steel Foundation (JISF). In an effort to enhance the reliability of product testing, the company uses high-precision equipment and is working to thoroughly prevent errors in identification work and data tampering by automating every process, from conducting tests that include instructions on testing and collating specimens to delivering test results.

Moreover, JFE Steel intends to provide customers with innovative value by operating its quality management system based on ISO 9001 and by maintaining the assurance certifications required for steel products, including the JIS mark and approvals from ship classification bodies as well as certification under the national standards of relevant foreign countries. It is also

actively promoting the formation and standardization of international rules in conjunction with future DX promotion and the social implementation of technologies obtained through research and development.

JFE Engineering

Products and services that JFE Engineering designs, procures, manufactures or constructs must comply with all required rules, regulations, and standards, and quality must satisfy the needs of our customers. Under this corporate policy, it continually strives to improve the quality of its products and services.

Specifically, our certified inspectors conduct on-site inspections at each phase of a plant construction project, including procurement, manufacturing, construction, and pilot operations. We also conduct witness inspections by customers during critical processes and at the time of equipment delivery to ensure quality.

In addition, JFE Engineering has published quality-assurance manuals based on the specific characteristics of each product and obtained ISO 9001 certification for each product category.

To further strengthen its quality assurance system, JFE Engineering uses an electronic document processing system in its quality inspections to prevent omissions in inspection data and data tampering, and all inspection data is electronically stored to further ensure traceability.

JFE Shoji

Guided by its quality philosophy of maintaining customer trust by consistently delivering products that satisfy quality requirements, JFE Shoji is constantly striving to enhance the level of its quality assurance for customer confidence and satisfaction. Its processing centers in Japan and abroad are systematizing and automating operations to eliminate human errors. Raising employee awareness is essential for preventing human error at every stage, from receiving orders to processing, inspecting and shipping. The company provides quality education for employees by introducing case studies of non-conformance at other companies as well as at Group companies in Japan and abroad. JFE Shoji also conducts a quality audit at all relevant Group companies in and outside of Japan to confirm the quality of each processing center and provide advice. Moreover, it follows up as necessary by continuously monitoring the progress of improvements to maintain and enhance the level of quality assurance.

Ensuring Stable Supply of Products

JFE Steel

JFE Steel is working to improve its manufacturing capabilities by actively utilizing digital technologies in its manufacturing processes. While strengthening its manufacturing base by introducing a cyber-physical system (CPS) for all manufacturing processes, JFE Steel is also striving to improve quality and yield through the full-scale introduction of quality prediction technology that uses integrated data from steelmaking to final processing, and to enhance reliability by increasing the frequency of automated testing and inspections.

These activities will stabilize facility operations as well as production and quality to safeguard the consistent delivery of high-quality products to customers.

JFE Engineering

JFE Engineering had been designated as a special construction business operator under the Construction Business Act to undertake mechanical, civil engineering, and building construction work, and assign dedicated managing engineers at construction sites to oversee the technical aspects of construction work. The smooth implementation of plant construction projects depends on licensed specialists. The company is always striving to secure the necessary human resources by encouraging employees to acquire qualifications by granting allowances and through mid-career hiring of licensed personnel.

JFE Shoji

JFE Shoji is strengthening its entire supply chain, from materials procurement to processing and distribution, to consistently meet customer demands. In the raw materials field, it has established a system and network for procuring iron ore, coal, and other raw materials for steel from Brazil, Australia, and other countries around the world. In the area of processing and distributing steel products, it is making capital investments for the Group and raising efficiency to realize an optimal system for sales and processing to meet customer demand while strengthening its quality assurance system by periodically conducting quality audits at Group companies.

Responsible Export Practices

Each JFE operating company promotes international peace and security by working against the spread of weapons of mass destruction and excess accumulation of conventional weapons. Specifically, the company carries out internal inspections to confirm the final destinations, customers and applications of its exported products, and then ensures that export procedures are carried out properly. In addition, the Legal Affairs Department conducts internal briefings to disseminate knowledge of export-related laws and regulations, such as the Foreign Exchange and Foreign Trade Act. Also, education on export security controls and related measures is implemented for the employees of Group companies involved in trading.

Improving Customer Satisfaction

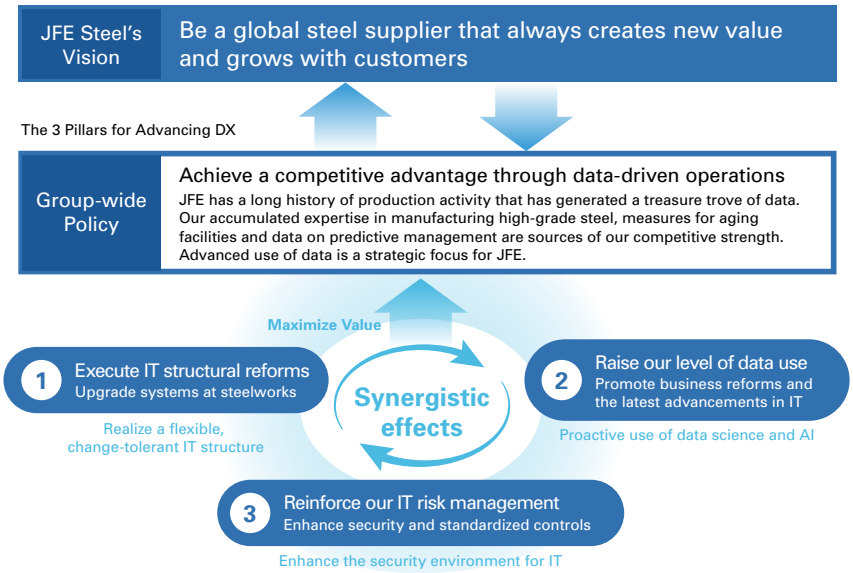
JFE Steel

Aggressive Advancement of DX

JFE Steel's Digital Transformation (DX) strategy revolves around technological innovation based on the active introduction of IoT, AI and data science (DS) and the application of data assets. Compared to mills in other countries, we possess an enormous amount of know-how and data accumulated through many years of production operations. Our abundant data assets are the source of our value creation.

We will harness the latest DS and AI technologies to make versatile use of such data in achieving innovative improvements in productivity, enhancing quality and ensuring stable operations to raise our competitiveness.

■ **Advancement of Digital Transformation (DX)**



Please see the DX REPORT.

➤ **DX REPORT** (https://www.jfe-holdings.co.jp/en/investor/library/dxreport/index.html)

Testing and Research Centers for Collaboration with Customers on Product Development

JFE Steel collaborates with customers in research and development. The Customers' Solutions Lab (CSL) for auto industry customers and the JFE Welding Institute -Center for Integrity against Fatigue and Fracture (JWI-CIF2) are located in eastern Japan, while the Customer Center Fukuyama (CCF), which develops materials and conducts applied technology research, is in western Japan. Using these facilities to strengthen early vendor involvement (EVI)*enables the company to quickly identify customer needs and develop products based on cutting-edge evaluation techniques and innovative production processes.

* Customer participation in product development is from an early stage to facilitate innovative new methods, functions, processes and evaluations for new steel materials.

Customers' Solutions Lab (CSL)

Enhancing Our Response to Customer Needs

In an effort to strengthen the company's total capabilities for better responding to customer needs, its sales department emphasizes sales education for sales personnel, from the headquarters and branch offices according to position, and for regional employees of overseas offices. Specifically, it develops abilities in areas such as engaging in technical conversations, picking up clues from customer relations and using them in product development, offering suggestions to improve logistics and distribution, and analyzing financial indicators and costs. We also constantly strive to improve our ordering system to ensure that customer product specifications are accurately reflected in manufacturing.

Unified Customer Care

JFE Steel regularly conducts customer questionnaires and interviews to draft strategies for greater customer satisfaction. Business strategies are shared among the sales divisions, the business planning functions and steelworks to facilitate unified customer care and proposals that leverage the collective strengths of the JFE Group.

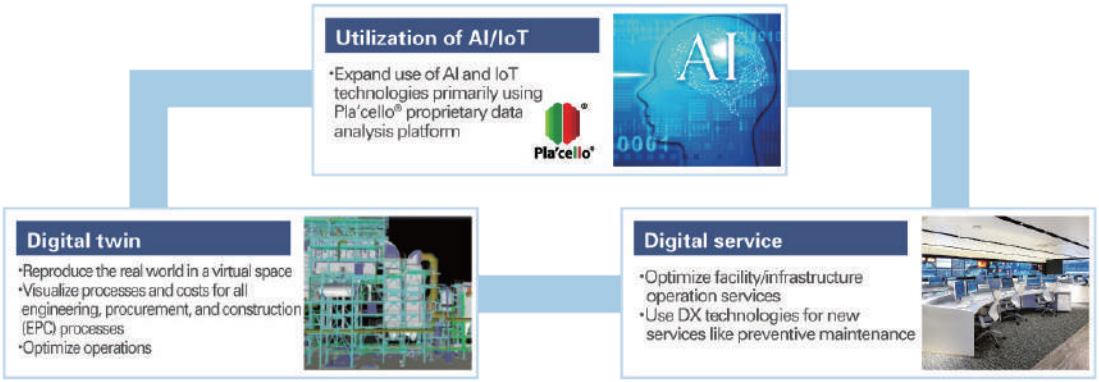
JFE Engineering

Create and Continue to care for the Foundation of Life by Maximizing DX

JFE Engineering plans, designs, builds and operates the infrastructure that supports people's lives and industry. Digital transformation (DX) is crucial for accelerating the pace of its work and for maintaining its position at the forefront of the engineering industry.

JFE Engineering will aggressively pursue DX beyond simply raising operational efficiency to fundamentally reform its operational processes, add new functions to its products and services, and take on the challenge of developing new businesses that utilize data, to realize a green society and enhance corporate value.

■ **JFE Engineering's DX strategy**



Please see the DX REPORT.

➤ DX REPORT (https://www.jfe-holdings.co.jp/en/investor/library/dxreport/index.html)

Engineering Company Assessments Based on Customer Evaluations

JFE Engineering uses customer surveys, interviews, and contractor performance evaluation forms to collect and assess data on the company's construction management, quality, advanced technologies and innovation. Each division analyzes and applies the data for quality improvement, new product development and the overall strengthening of aftersales service, to ultimately enhance customer satisfaction.

JFE Shoji

Establishing a System to Meet Customer Needs

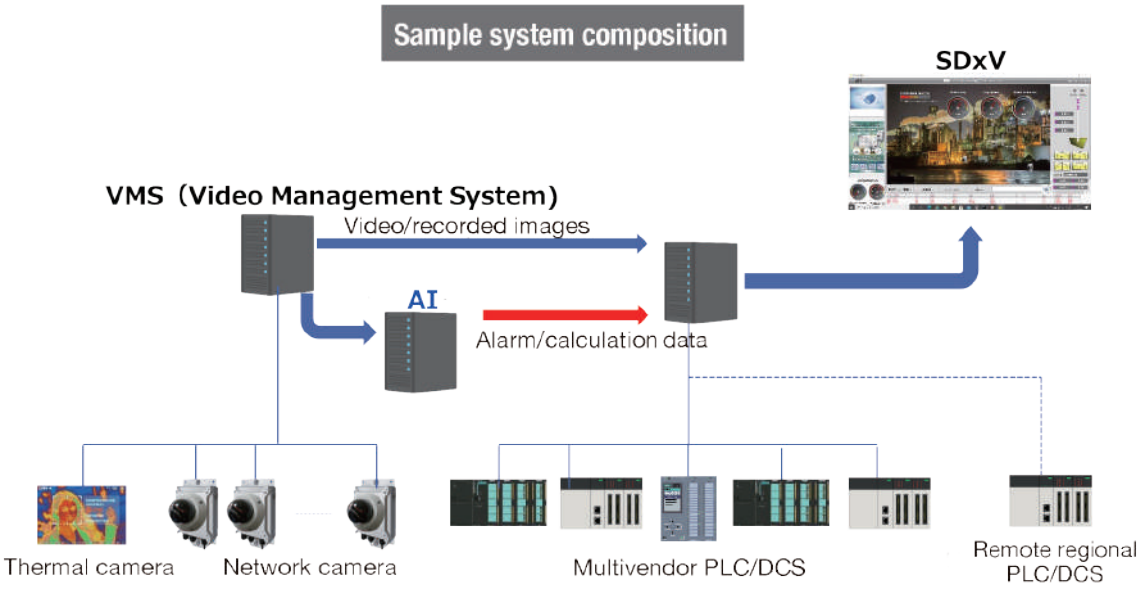
To meet the needs of diversifying markets and the increasingly sophisticated requests from customers, JFE Shoji is planning to introduce DX solutions that leverage the strengths of the JFE Shoji Group.

JFE Shoji Electronics Corporation, a subsidiary of JFE Shoji, began offering SDxV, a remote monitoring system that facilitates the integrated management of steel mills and other plant information, such as temperature and pressure as well as images from monitoring cameras, for the sake of transforming business and creating new value. The introduction of SDxV supports the centralized visualization of facilities and plant sites, not to mention the acquisition of useful information for AI-based abnormality detection and predictive maintenance.

We will continue to explore ways to provide innovative value to customers at the manufacturing sites through the use of DX.

■ System Overview

- The Supervisory Control And Data Acquisition (SCADA) system, which supports the integrated management of various scattered data (e.g., control/plant operation status), is combined and synchronized with the display of images from optical cameras and thermal cameras on the same screen.
- Centralized visualization and monitoring as well as remote control of events occurring in the plant.



Please see the DX REPORT.

➤ DX REPORT (https://www.jfe-holdings.co.jp/en/investor/library/dxreport/index.html)

Promotion of Research and Development

JFE Steel

Under the Seventh Medium-term Business Plan, JFE Steel is researching and developing innovative technologies for the steel manufacturing process for achieving carbon neutrality, such as CO_2 reduction technology, carbon-recycling blast furnaces and CCU, and hydrogen-based ironmaking (direct reduction). These technological developments leverage data science and robotics to closely align with the needs of customers and society at large.

In addition, JFE Steel is accelerating the introduction of new products and solutions for each field, with automobiles including EVs and new energy as key areas of R&D.

JFE Engineering

JFE Engineering is promoting research and development with a focus on five key areas: waste to resource, carbon neutrality, composite utility services, core infrastructure, and DX as the technological foundation that supports these four business areas. The company is particularly focused on carbon neutrality, which includes manufacturing technology for monopile foundations for offshore wind turbines, CO_2 capturing technology from the exhaust gas of waste incineration plants, and methanol production technology from the captured CO_2.

Internal Awards

The following technical and product developments were awarded in FY2022.

■ **Internal Awards (FY2022)**

	Prize/Award	Project	Recipient
JFE Steel	Grand Prize/ Excellence Award, JFE Steel President's Awards	Automation of blast furnace operations through DX (CPS)	Cyber Physical Systems R&D Department, Steel Research Institute, etc.
		Establishment of DX infrastructure by fully opening the head office core system	IT Reform Department, etc.
		Popularization and sales expansion of high-strength spiral steel pipe piles in response to national land resilience	Building Materials Sales Department, Building Materials Center, etc.
		Development of long-life staves for blast furnaces and establishment of technology to optimize stave replacement methods	Facilities Department, West Japan Works (Kurashiki Area), etc.
		Improvement of work safety, security, and efficiency through a work support system	Environment and Disaster Prevention Department, West Japan Works (Fukuyama Area), etc.
JFE Engineering	Grand Prize, JFE Engineering President's Awards	Development of a high-precision gas demand forecasting model using WinmuSe®	Digital Transformation Headquarters

For more on the external awards, please refer to the following.

➤ Eternal Awards (P.259)

Human Capital

Basic Policy

The JFE Group intends to establish its position as a company that is essential to the sustainable development of society while also creating safe, comfortable lives for people everywhere. So that it can continue to enhance corporate value under an increasingly complex and rapidly changing business environment, each and every employee must be able to provide support. We established the JFE Group's Basic Policy on Human Resource Management and the JFE Group Health Declaration and are working on measures to maximize the abilities and vitality of our employees by investing in human capital.

Occupational safety and health depends upon ensuring employee well-being and safety as a basic corporate requirement, particularly for manufacturers, and is fundamental to the continued existence of any company. The JFE Group adheres to the philosophy of safety first, and, together with its Group companies and partner companies, is promoting safety and health activities and effectively operating an occupational health and safety management system to promote a safe and healthy workplace. Furthermore, the Group seeks to create safe, attractive environments where everyone can enjoy working and aggressively promotes the establishment of settings in which personnel with diverse backgrounds can demonstrate their full potential. To that end, it collaborates with its health insurance union and industrial health staff to maintain and strengthen employee health so that everyone can work with vigor.

To recruit and nurture diverse human resources, we are working to secure diverse human resources and foster human resources who serve as the backbone of our business, create workplace environments and systems for employees to fully demonstrate their abilities with a sense of fulfillment, and realize new workstyles that are not restricted by time or location.

JFE Group's Basic Policy on Human Resource Management

1 Respect Human Rights and Facilitate Fair Management of Human Resources

The Group manages human resources fairly by respecting the human rights of all employees and nurturing employees who embrace the Group's corporate values and standards of business conduct.

2 Foster a Corporate Culture that Nurtures People and Promotes Satisfying Workplaces

The Group facilitates interactive communication among employees to cultivate a corporate culture that nurtures human resources and creates safe, attractive environments where everyone can enjoy working.

3 Diversify Human Resources

The Group ensures that diverse all people, including women, non-Japanese, the elderly and the disabled, can demonstrate their full potential.

4 Recruit and Steadily Nurture Excellent Human Resources

To survive in an increasingly complicated and diversified business environment, the Group steadily recruits diverse, high-quality skilled human resources, ensures that they receive the skills and knowledge necessary to continue strengthening the Group's technological capabilities, and nurtures their global capabilities.

Poster displayed at each workplace

JFE Group Health Declaration

1. JFE, recognizing that safety and health are fundamental for fulfilling its mission, creates workplaces in which every employee can work with vigor.
2. JFE and its health insurance union work together to advance initiatives for maintaining and upgrading the physical and mental health of employees and their families.
3. JFE gives top priority to safety and health and to creating a health culture in which each employee takes personal responsibility.

Targets and Results

Having identified the prevention of workplace accidents and ensuring of the health of employees and their families as material issues related to occupational safety and health, the JFE Group has set KPIs to manage progress and promote relevant initiatives.

To prevent occupational accidents, it is committed to creating a safe work environment by adhering to the philosophy of safety first. To achieve our top-priority goal of zero major accidents, as set forth in the Seventh Medium-term Business Plan, we will bolster safety education and require stringent compliance with related rules while further striving to reduce occupational health and safety risks by actively making each facility inherently safe. To ensure the health of our employees and their families, we are implementing health and productivity management by setting targets for the provision rate of health guidance and smoking rates.

Moreover, as defined in the JFE Group's Basic Policy on Human Resource Management, we are committed to fostering a nurturing corporate culture, creating satisfying workplaces, diversifying human resources, and recruiting and steadily nurturing excellent human resources. We have set KPIs for diversity and inclusion, the promoting of human resource development, and the creation of motivating workplaces as key management issues related to recruiting and nurturing diverse human resources, to manage progress and promote relevant initiatives.

Data related to Lost-Work Injuries, see:

➤ **Data related to Lost-Work Injuries and Accidents** (P.243)
➤ **Material Issues of Corporate Management and KPIs** (P.20)

Occupational Health and Safety

Initiatives

Occupational Health and Safety Initiatives

To ensure safety at its operating companies, the JFE Group regularly reports to the Board of Directors, which provides direction and supervision. It also holds discussions on health and safety with the labor union through the Occupational Health and Safety Committee.

To achieve our goal of zero workplace fatalities under the Seventh Medium-term Business Plan, the JFE Group particularly prioritizes safety investments (around 10 billion yen per year Group-wide) to reduce risks by making workplaces inherently safe. We will also promote multifaceted occupational employee health and safety activities, including detection and monitoring, by harnessing advanced IT solutions.

The JFE Group also organizes seminars for newly appointed managers and supervisors to provide information on the Industrial Safety and Health Act and risk assessment regulations and on formulating work plans and policies for health and safety management. In the construction operations department, we offer programs for local superintendents in charge of construction work (Overall Safety and Health Controller) centered on the Industrial Safety and Health Act as well as related regulations for subcontractors and the Construction Business Act (409 participants in 2022). We also conduct new employee training and position-specific training on mental health (751 participants in 2022).

JFE Steel

In 2023, we are following two basic strategies: practicing autonomous safety activities while strengthening communication between employees and business associates and taking action based on the Group's Health Declaration. In accordance with our goal of achieving zero accidents Group-wide and zero accidents at each workplace, management supervisors make a point to visit work sites every day, while workers are striving to handle their tasks with discipline. We are also proactively applying IT, such as by introducing safety monitoring systems* for safety management.

In order to more independently and systematically promote occupational health and safety management throughout the organization, we established an occupational health and safety management system in accordance with the ISO 45001 international standard and obtained ISO 45001 certification (JIS Q 45001) for all our construction and operating sites. We will continue making workplaces safer and healthier through an ongoing and effective operation of the occupational health and safety management system.

Certified Sites

- Chita Works (September 9, 2021)
- Fukuyama Area (December 16, 2021)
- Chiba Area (May 26, 2022)
- Kurashiki Area (May 26, 2022)
- Sendai Works (December 15, 2022)
- Keihin Area (January 19, 2023)

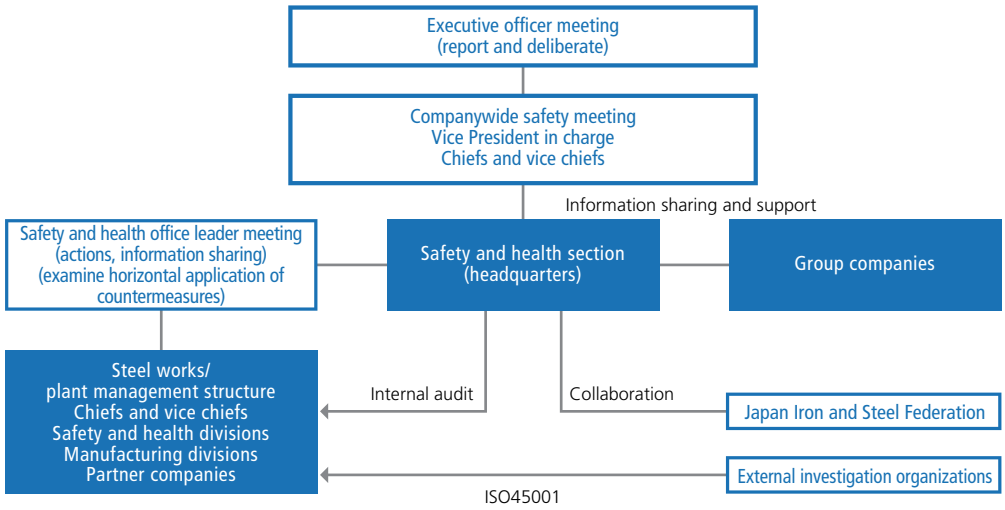
To mitigate or prevent disaster risks, JFE Steel conducts risk assessments at the planning stage for new facilities as well as prior to periodic and as-needed repairs. We also constantly strive to make each facility inherently safe so as to lower the risk level for our workers.

We respond to industrial accidents by setting up a disaster investigation committee to determine the cause and offer recommendations for improvement to the department in charge of implementing countermeasures. At the same time, we inform the relevant departments and labor union through the Occupational Safety and Health Committee, while the department in charge implements and completes countermeasures, which is a mechanism designated by company-wide rules. In the event of severe accidents, a response is deployed across the company, and a standard progress report is submitted to Corporate Officer Council until countermeasures have been completed. This practice has also been standardized across the entire company. In the event of other incidents, we discuss and determine the need to deploy a company-wide response with top management before taking action.

In addition, we immediately report industrial accidents to the Japan Iron and Steel Federation (JISF) under the required guidelines. We file an update once we have determined the cause and decide on countermeasures. In the event of severe accidents, we promptly submit a report on safety, disaster prevention and environmental issues to the Ministry of Economy, Trade and Industry, the Ministry of Health, Labor and Welfare, and the JISF.

* A system that provides managers with real-time information about, for example, carbon monoxide concentration and oxygen concentration along with worker locations.

■ Management Structure for Health and Safety



JFE Engineering

In addition to setting up governance organizations for health and safety at each operating site to comply with the Industrial Safety and Health Act and in line with the type of work and number of employees, JFE Engineering has established a governance structure for health and safety at each operational headquarters to facilitate and effectively implement company-wide management at its construction and operating sites and manufacturing plants. JFE Engineering strives to eliminate disasters at all suppliers and Group companies by establishing priority items to be shared across the company and to which all employees and all staff at suppliers adhere. It also endeavors to identify sources of danger as well as safety measures through risk assessments aligned with the particular characteristics of each individual operational headquarters. Meanwhile, it promotes physical and mental health and the creation of comfortable working environments as a means of ensuring the health of employees and bringing occupational health to an overall higher level.

In the event that an industrial accident occurs, occupational health and safety managers will meet to determine the cause and consider countermeasures that will be deployed across the company. Since 2016, the company has been operating an occupational health and safety management system (ISO 45001 certified) for its construction activities in Japan and overseas as well as its manufacturing operations at the Tsurumi and Tsu Works. As a new initiative, JFE Engineering applies IT solutions promoting occupational health and safety, including monitoring and detection by multiple approaches.

JFE Shoji

JFE Shoji is implementing the following activities to eliminate unsafe operations that could lead to severe accidents for achieving zero severe accidents at its coil centers and other processing sites.

(1) Risk assessment involving on-site patrols by management supervisors for identifying unsafe operations or hazard prediction by staff responsible for each operation
(2) Comparative study of similar disaster cases and hazard experience training for improving the ability to recognize and avoid unsafe operations
(3) Facility improvement for reducing risks, including installation of safety sensors
(4) Operation training (slinging for cranes and other skills) and review of operational standards

Furthermore, for each of its Group companies, JFE Shoji assigns a safety manager to spearhead these efforts to raise the level of health and safety activities. To ensure that all JFE Shoji Group companies operate under the same values, safety managers meet every other month to share knowledge and information on occupational health and safety.

All lost-work injuries must be reported to the top management from the president of each Group company as part of the JFE Shoji Group-wide effort to address safety management. Annual safety awards are also presented to encourage employees to actively engage in health and safety activities. Through these initiatives, the company will raise the level of safety management within the JFE Shoji Group and continue to maintain safe working environments.

Health and Productivity Management

Company-wide Targets for Each Operating Company

We are working on health and productivity management by setting Company-wide goals for each of our operating companies, in addition to KPIs common to the JFE Group.

	Items	FY2022 Results	FY2023 Targets
JFE Steel	Thorough implementation of physical examinations	85.4%	Rate of complete exams: 100%
		55.1%*1	Rate of complete exams for dependents: 60%
	Preventive health measures	—*2	Rate of providing specific health guidance: at least 60%
		30.7%	Rate of obesity (BMI: 25 or higher): 25% or less
	Promotion of non-smoking and segregated smoking	26.6%	Smoking rate: 26.5% (1.5% annual reduction)
JFE Engineering	Measures related to sleep	36.7%	Sleep-related risk (based on responses in health checkup questionnaire): 35% or lower
	Measures related to passive smoking	22.3%	Smoking rate: 21.3% or lower (1% annual reduction)
	Measures related to obesity	40.5%	Obesity rate (BMI: at least 25 or abdominal circumference ≧85/≧90 for male/female): 38.3% or lower
	Collaborated health promotion	—*2	Rate of providing specific health guidance: at least 50.0%
		54.4%*1	Rate of complete exams for dependents: 60%
JFE Shoji	Preventive health measures	—*2	Rate of providing specific health guidance: 60%
	Family health promotion	55.4% *1	Rate of complete exams for dependents: 60%
	Measures for non-smoking and passive smoking	21.9%	Smoking rate: 20.9% (1% annual reduction)

*1 Preliminary figures

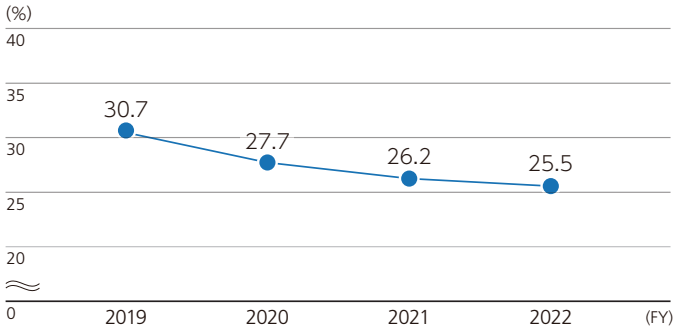
*2 Actual rates of providing specific health guidance will be added as soon as they are confirmed.

* JFE Steel manages the rate of complete exams, obesity rate, and smoking rate on a calendar year basis.

Physical Health Initiatives

- Ensure the implementation of regular physical examinations and strengthen cancer screenings.
- Prevent aggravation of lifestyle diseases by conducting metabolic syndrome checkups and offering health guidance.
- Utilize the health insurance union's health promotion app, PepUp, to educate employees on physical exercise and other healthy habits.
- Promote non-smoking areas and maintain separate areas for smokers and non-smokers in buildings. Provide guidance to help employees quit smoking through industrial physicians and public health nurses.

■ Changes in Smoking Rates (All Operating Companies)



Maintaining and Promoting the Health of Employees' Families

The JFE Group works with the health insurance union to maintain and improve the health of employees and their families by, for example, encouraging spouses to undergo health examinations. The rate of health examinations for dependents (age 40 or older) has been steadily increasing to 51.5% in FY2022, up 13.9 points from 37.6% in FY2014.

For employee health data, please refer to the following.
➤ Employee Health Data (P.245)

Mental Healthcare

The JFE Group conducts four basic initiatives to maintain the mental health of employees: "self-care" for workers who strive to remain aware of stress and take preventive measures; "care by management supervisors" who provide advice to subordinates; "care by industrial health staff" who support employees, managers and supervisors; and "care by human resources outside workplaces," including specialist clinics and individuals.

JFE's health insurance union also provides mental health counseling, including a 24-hour hotline for employees and their families (spouse and dependents).

Initiatives on Health Issues

We operate a health management system for continuously and effectively managing the health of all employees, including those on overseas assignments and business trips and those studying abroad.

We particularly seek to ensure that employees working abroad, under healthcare systems that differ from those in Japan, can maintain a healthy lifestyle, along with their accompanying family members, by conducting health checkups and vaccinations before they move overseas, in accordance with Company-wide regulations. In a proactive effort to prevent infections, we also provide information on global health issues such as COVID-19, HIV, tuberculosis, and malaria during assignment briefings. We will continue to monitor and appropriately respond to global health issues.

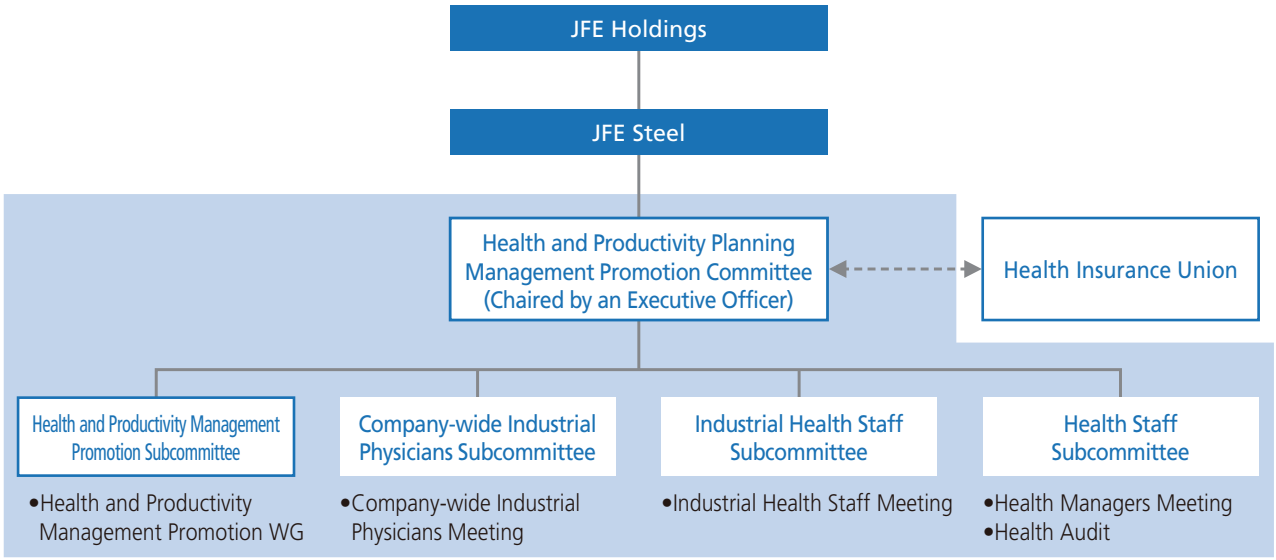
JFE Steel

Promoting Health and Productivity Management to Maintain and Improve Health

To drive key initiatives for maintaining and improving the health of employees and their families, JFE Steel launched the Health and Productivity Management Promotion WG upon the establishment of its Group Health Declaration in 2016 and is monitoring the achievement of medium- to long-term goals. Through these ongoing activities, we want all employees to work healthily and vigorously and to establish a health culture in which every employee practices activities on their own initiative to maintain and improve their health.

The Health and Productivity Management Promotion WG first focused on physical health and established key initiatives regarding: (1) thorough implementation and reinforcement of physical examinations, (2) preventive health measures, (3) establishment of sound exercise and health habits, and (4) non-smoking and segregated smoking activities. We are now implementing activities with all of our operating sites.

■ Health and Productivity Planning Management Promotion System



■ Objective of the Health and Productivity Management Promotion WG

Realization of the JFE Group Health Declaration

To enable all employees to work in good health and vigor
To establish a health culture in which each and every employee practices activities at their own initiative to maintain and improve their health

Work Environment Health

- Workstyle reform
- Promotion of women's participation and advancement in the workplace
- Promote diversity

Mental Health

- Stress check WG
- Expand mental health counseling services
- Expand steel mill compliance training

Physical Health

- Health and Productivity Management Promotion WG

Main Themes:

1. Thorough implementation and reinforcement of physical examinations
2. Preventive health measures
3. Establishment of exercise and health promotion habits
4. Promotion of non-smoking and segregated smoking activities

■ Health and Productivity Management Promotion WG

Members	• Each region, works, main office	• Industrial physicians and public health nurses • Manager of Labor Management Office, Labor Management HR Department, Organizational HR Department • Office of Safety and Health (health staff), Safety and Health Department
	• Health Insurance Union	• Directing Manager, Manager of Health Development Office
Discussion topics	• Evaluation of Health and Productivity Management (physical, mental and work environment) Evaluation of indices and activities: • Company-wide promotion activities • Reporting health and productivity management plans and results to the management team	
Frequency	Twice a year	

Active Exercise™

JFE Steel business sites offer the Active Exercise™ program, designed by West Japan Works to help people increase their physical strength and prevent injuries from falling. The program's effectiveness in preventing occupational accidents and improving health has even attracted attention outside the company, so it is being actively shared not only among Group companies but also with on-site suppliers and companies across a broad range of industries. To prevent accidents such as falls and back injury, we participate in the Ministry of Health, Labor and Welfare and the SAFE Consortium as well as activities such as Active Exercise™ and Safe Physical Fitness™ Functional Tests.

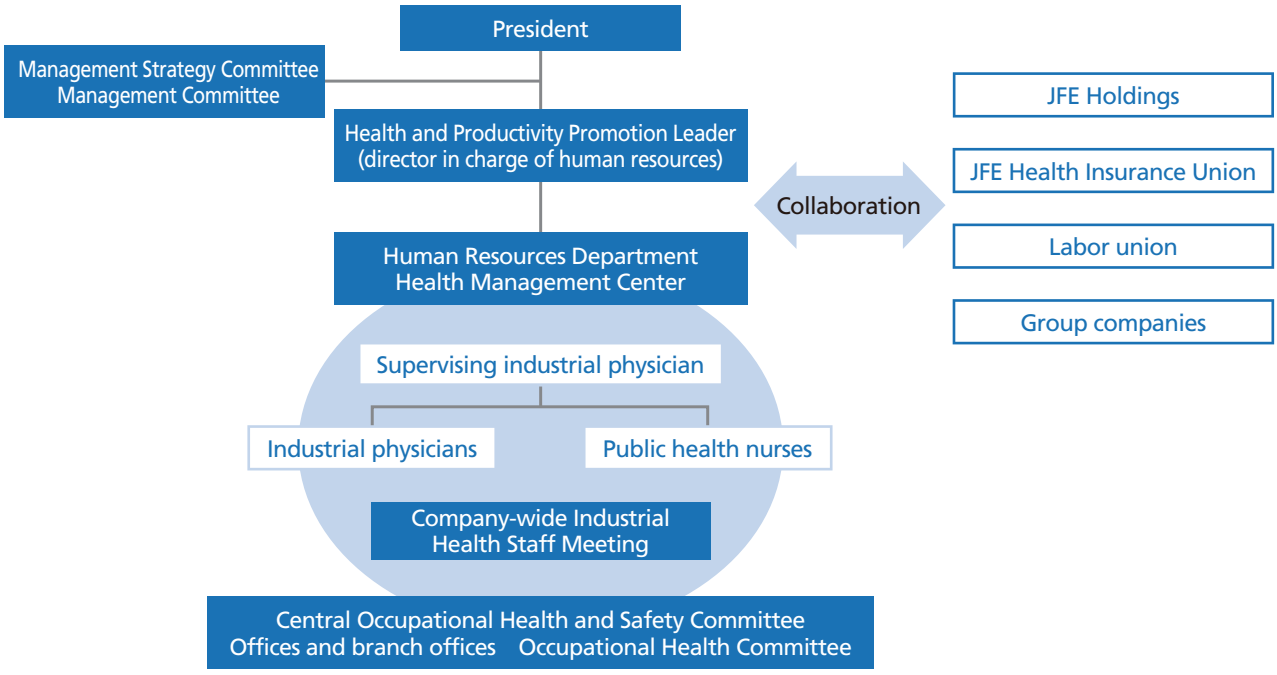
JFE Engineering

Engineering Activities for Boosting Health Based on Health Checkup Data

JFE Engineering is pursuing initiatives for improving health focused on five domains, including sleep, smoking and obesity issues extracted from past health checkup data, along with cancer and mental health.

In FY2020, we appointed a supervising industrial physician and reorganized the company-wide health and productivity management promotion system while also providing support to Group companies.

■ Health and Productivity Management Promotion System



■ Initiatives Based on Past Health Checkup Data

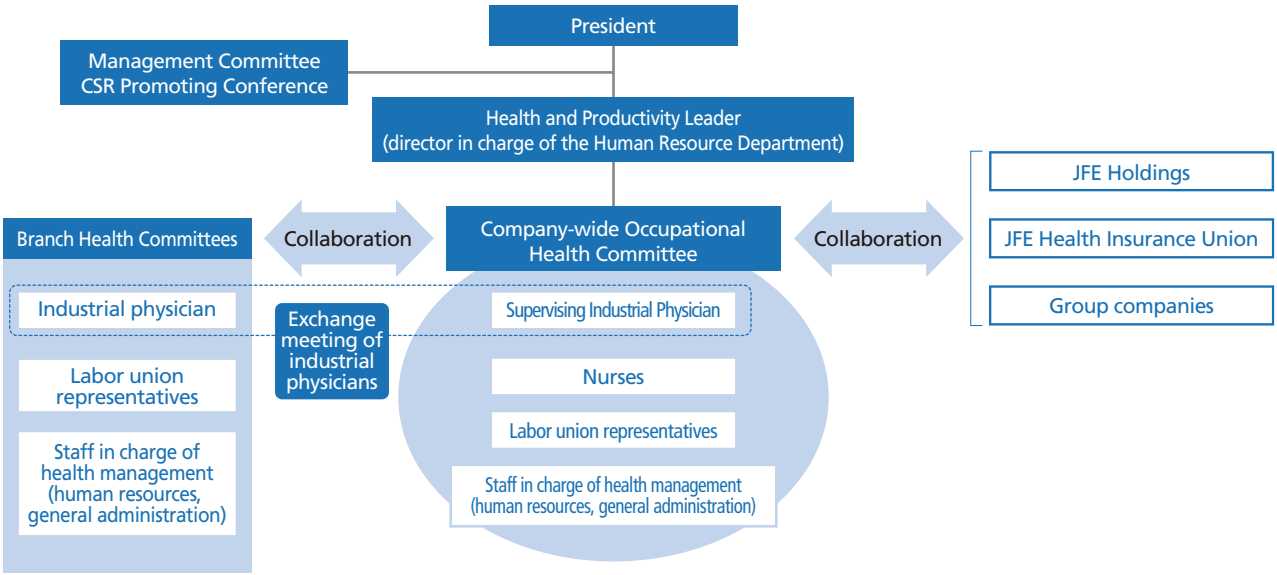
Fiscal Year Launched	Purpose	Initiatives
2018	Preventing cancer	Stomach endoscopy during regular health checkups
2019	Improving sleep habits	Company-wide self-care seminars to practice napping and breathing exercises
2020	Addressing obesity	Labor and management co-sponsored RIZAP seminars and workplace exercises at home
2021	Ending exposure to passive smoking	Complete ban on indoor smoking
	Improving sleep habits	Company-wide self-care seminars to practice sleeping and breathing exercises
2022	Providing more personalized guidance	Provision of more individualized guidance on sleep, obesity, smoking, etc.

JFE Shoji

Detecting Illnesses at an Early Stage, Maintaining and Promoting Health for Employees and their Families

JFE Shoji believes that the health of employees and their families holds the key to the further development of the company and is therefore creating workplace environments in which employees can work with vigor.

■ Health and Productivity Management Promotion System



■ Past Initiatives

Fiscal Year Launched	Purpose	Initiatives
2018	Prevent cancer	Helicobacter pylori tests conducted during regular health checkups
		New program for subsidizing examination fees for breast cancer and uterine cancer
	Raise employee health awareness	e-learning program based on the importance of regular health checkups, and reducing heart and brain disease
2019	Prevent lung cancer and stroke	New program for subsidizing smoking cessation clinic fees
	Measures related to passive smoke (reduction in smoking rate)	
2020	Encouraging employees to exercise as a habit	Encourage participation in the Powering Up Health Care program
2022	Providing more individualized guidance	Encourage individual consultation to those eligible for specific health guidance

Response to the COVID-19 Pandemic

The JFE Group recognizes the importance of social infrastructure that manufactures and supplies the necessary goods for society and fully understands the purpose and content of the government's basic policy to respond to COVID-19. We place the highest priority on employee health and have taken action from the perspective of the basic approach to preventing infection and specific measures to be taken as outlined in the guidelines issued by the Japan Business Federation. While taking into account the conditions of factories and other factors, we have worked to prevent the transmission of COVID-19 and have continued to fulfill our role as a social infrastructure, including providing vaccinations at workplaces.

In response to changes in the infection rate, we have responded in a timely and appropriate manner in accordance with each request issued by the government and Japan Business Federation.

Response after COVID-19 Was Reclassified as Class 5

Since COVID-19 was reclassified as Class 5 in May 2023, we have been responding in accordance with government guidelines, and every Group company has returned to normal working rules. Nevertheless, all employees are encouraged to take basic infection prevention measures, such as washing hands and gargling. As mutant strains or new infections occur in the future, we will use all of our experience in responding to COVID-19 while acting in accordance with prevailing government policy.

Recruiting and Nurturing Diverse Human Resources (Labor Standards)

Initiatives

New Workstyles

To ensure the sustainable development of the JFE Group, it is essential to fundamentally review past customs and develop workstyles that enable each employee to be highly productive in creating new value with pride and satisfaction in their work. Under the Seventh Medium-term Business Plan, we intend to continue building workplace environments and internal systems that enable employees to fully demonstrate their abilities with a sense of security and safety.

Promoting Satisfying Working Environments

The JFE Group complies with laws and regulations related to salary payments and sets salaries above the minimum wage designated by country, region and industry sector to meet living wage requirements. In addition, the Group establishes challenging and satisfying working environments by providing employees with one of the top levels of employment conditions in the industry as well as performance-based bonuses linked to company profits.

Besides complying with regulations, such as on overtime limits, our meetings, including those of the Board of Directors, regularly address the status of working hours and workstyles at operating companies, and the members promote initiatives aimed at reducing total working hours and adapting to new workstyles.

Furthermore, the Group offers generous welfare benefits, including dormitories and company housing in order to provide a stable environment for our employees and encourage them to remain with the company for many years.

JFE Steel

Promoting a New Workstyle

As JFE Steel takes on the challenge of achieving the most significant transformations since its founding under the Seventh Medium-term Business Plan, including a shift from quantity to quality, the company is accelerating its efforts to establish an environment that offers employees the flexibility to choose the workstyle most productive for them and brings out the best of their abilities.

Public response to the state of emergency declared under the COVID-19 pandemic led to the widespread adoption of new styles of living and working. This was also true at JFE Steel, where employment styles that combine working at the office and at home have become emerged, mainly at the head office and branches. Employee workstyle values have also changed significantly. Seizing this as an opportunity to move beyond responding to COVID-19, JFE Steel is promoting its new workstyle so that employees can work with a sense of job satisfaction and fulfillment, which in turn will lead to improving productivity across the company. In concrete terms, the company will promote teleworking by expanding its work-at-home systems; introduce a coreless flexible working hour program; adopt a shared-desk policy at the head office; introduce chat and web conferencing tools and robotic process automation (RPA), a software program that facilitates the automation of work done on terminal devices; promote paperless offices by introducing electronic contracts; and eliminate the use of seals by applying workflow automation software. Through these efforts, we will seek to reduce total working hours while also shifting to a workstyle with higher added value and transforming our corporate culture.

In addition, JFE Steel introduced a cafeteria plan as an employee benefit in FY2022 to meet the diversifying needs of employees following a rise in the number of mid-career hires and other changes. The company seeks to enhance the work-life balance by encouraging employees to take paid leave by designating annual planned leave days and offering a work-life-balance vacation program to support employees in taking vacations for childcare, nursing care, self-enlightenment, or participation in volunteer activities. In FY2022, it revised the work-life-balance vacation program to make it available for infertility treatment as well.

JFE Engineering

Enhancing Productivity with New Workstyles

JFE Engineering is promoting "vacation-style reform" across the company. Employees are encouraged to take Fridays off during the summer and consecutive days of paid leave following the completion of construction work. Out of 22 paid leaves granted, 19 paid leave days on average (over 86% of the total) were taken by employees in FY2022. The company intends to raise the average taken to at least 20 in FY2023.

As part of its workstyle reform, JFE Engineering has introduced a flexible working hour program for offices, in which employees determine their own core work hours. Under the program, the company designates "no overtime days" on which employees must leave the office on time and in principle prohibits overtime work after 8 pm to encourage employees to work more efficiently. Teleworking, which was introduced as a preventive measure against COVID-19 infections, has been adopted as a permanent system since FY2021. Employees can work at home or at any of the roughly 400 shared offices nationwide, thereby supporting flexible workstyles.

In the area of construction, JFE Engineering is making greater use of IT at construction sites and expanding on-site support provided by the head office using remote environments to fully adopt a five-day workweek.

JFE Shoji

Initiatives to Support Various Workstyles to Realize a Work-life Balance

As a measure to realize a work-life balance, initiatives have been implemented to reduce work hours, such as designating Wednesdays as the day to encourage everyone to leave on time, prohibit all work after 10 pm, and also designating days when employees are encouraged to take paid leave. To support more diverse workstyles, JFE Shoji changed its flexible working hour program in April 2016 by setting the core worktime between 11 am to 2 pm, and by introducing work-at-home systems for employees pressed for time due to childrearing or nursing duties.

The company also periodically designates "challenge days" to help all employees become aware of and practice a healthier work-life balance, and it implements various initiatives to reform workstyles, such as requiring employees to leave work on time on designated days and having them declare the time they will leave the office on certain days while also making sure they keep to it.

Looking beyond COVID-19, the company set up a project team to explore new workstyles that are even more efficient and flexible, and it will consider promoting paperless offices based on digitization and developing offices that meet the needs of the new normal.

Operational Reforms

JFE Steel

Promoting Operational Reforms that Leverage the Newest ICT

To reduce employee time spent on simple for repetitive tasks and free up more time for creative work, JFE Steel implemented RPA, a software to facilitate the automation of human work done on terminal devices. As of FY2022, RPA was deployed in over 700 types of operation, releasing over 85 thousand hours to be spent on other productive work.

JFE Steel is also expanding its RPA in-house development program, which began in the latter half of FY2020, across the company, with more than 320 people having completed the academy for development tools. In addition to low-code development tools, the company is promoting in-house development using workflow systems, to improve operational efficiency as well as promote workstyle reforms, such as eliminating the use of stamps and shifting to a paperless system. The time saved from these operational reforms will be used toward enhancing customer service.

To promote data-driven operational reform, the company will also rollout a new BI tool company-wide to speed up decision-making by visualizing and sharing data, thereby enhancing corporate competitiveness.

JFE Engineering

Smart-Work Project

JFE Engineering introduced an electronic seal system for all employees to eliminate the need to come into the office to apply the seal to more efficiently use remote work. As a result, more than 10,000 documents were digitized each month, reducing paper use by 50%. In addition, RPA, used to automate over 270 tasks as of FY2021, automatic note-taking tools for remote meetings, and automatic translation tools increasingly being used by overseas divisions, have also contributed to raising operational efficiency.

By introducing various systems, measures and tools to boost efficiency, JFE Engineering intends to achieve both work-life-balance and improved productivity while maximizing overall output.

JFE Shoji

J-SLIM Activities

JFE Shoji will continue to drive its J-SLIM activities, which is an operational reform aimed at increasing work efficiency and performance. At the 2022 J-SLIM presentation, 24 teams from JFE Shoji and domestic and overseas group companies presented their J-SLIM activities online, which was viewed by a total of 2,800 people across the group. These activities included reviewing how to share information, reducing work hours by introducing the latest IT tools including RPA, and improving the accuracy and efficiency of office work by utilizing data and EXCEL functions. JFE Shoji is promoting the sharing and horizontal deployment of these activities that lead to improved productivity throughout the Group. The company will continue to foster a corporate culture that can flexibly adapt to the changing times and constantly seek change free of preconceived notions.

Invigorating Workplaces through Small Group Activities

JFE Steel

In JFE Steel, approximately 1,500 small groups carry out J1 Activities* that have yielded various results in the key areas of quality and work improvement. In addition, the JFE Family Result Reporting Conference, which includes participation from Group companies, is held twice a year, and groups that excelled in the competition are dispatched to QC Conventions and affiliated companies in Japan and overseas to strengthen the J1 Activities.

* Designed to turn JFE into an excellent company and propel it to the number one position in its industry (called JE1 Activities at JFE Engineering and J1 Activities at JFE Steel and JFE Shoji).

JFE Engineering

JFE Engineering has about 250 teams and 1,900 employees, including those of group companies worldwide, involved in JE1 Activities. The results of these activities are showcased at a company-wide competition held at the end of the fiscal year. Activities focused on topics such as quality, efficiency, safety or costs contribute significantly to workplace vitality and corporate performance.

JFE Shoji

JFE Shoji has been conducting J1 Activities in production divisions of its group companies in Japan as a means of improving their problem-solving skills in areas such as safety, quality, cost, operations and delivery target. The company holds annual competitions in which about 20 teams report their activity results and awards are given to the highest achieving teams. The company will continue to promote J1 Activities to improve workplace vitality and improve problem-solving skills.

Diversity and Inclusion

Structure for Promoting Diversity

Each operating company has a Diversity Promotion Section to steadily promote initiatives to raise employee awareness, increase the number of women hired, and establish a system that supports women at work. In addition, the JFE Group has established a diversity committee, headed by the president, and the management and promotion organization work together to formulate and implement Company-wide policies.

Initiatives to Promote Diversity

In a rapidly changing business environment, the JFE Group believes that the fusion of various values and ways of thinking will lead to the creation of unprecedented ideas and solutions, which ultimately results in sustainably enhancing corporate value. For this reason, the Group has positioned diversity and inclusion as a key management concern and is working to create an environment where employees with diverse backgrounds, including gender, nationality, values, and different lifestyles, can demonstrate their abilities. We developed even more ambitious KPIs particularly to support the advancement of women, such as number and ratio of women appointed to management positions and the ratio of female hires, starting in FY2022. Every operating company formulates a company-wide policy through discussions with management. These efforts include recruitment measures to increase the number of candidates for female management positions, and retention measures through the enhancement of internal and external networking and the presentation of role models, as well as placement and development measures through the creation of individual training plans for female employees.

JFE Steel

JFE Steel is working to cultivate a culture in which diverse human resources can demonstrate their full potential by providing diversity training for management and managers and designating a Diversity Month. Since FY2021, the company has had ongoing discussions on diversity issues and initiatives mainly at the management level. Starting in FY2023, the officers and general managers have set diversity targets to strengthen activities in each division and workplace. To promote the advancement of women, the company provides career training for female employees and their supervisors and actively dispatches female employees to external training programs to increase the number of female employees appointed to management positions. Online career exchange meetings between business sites planned together with female employees have also started. For female employees working in workplaces that operate in shifts, the company has also established a program for helping them maintain their work-life balance by discussing their career development through interviews with their supervisor and the personnel division. Through this program, JFE Steel is providing the best possible support for female employees so they can continue working after pregnancy, childbirth, or other major life events. To encourage male employees to be engaged in parenting, labor and management has discussed the issues related to taking childcare leave and jointly issued a message recommending that these leaves be taken. In addition, the company supports employees at various life stages, such as by holding seminars on balancing nursing care and work. All of these efforts are intended to create a workplace where employees feel comfortable and fulfilled.

JFE Engineering

JFE Engineering engages in activities for reforming its corporate mindset, including diversity seminars for managers, e-learning programs for all employees and the annual Diversity Month. In FY2022, as part of the CSR promotion system*[1], the Diversity Committee, comprising the management team, was established to deploy company-wide policies and formulate and implement plans for each organization. For female employees, the company organizes leadership seminars and opportunities for exchange. It also accepts around 80 locally hired employees*[2] of overseas Group companies at any given time to provide on-the-job training. The company also strives to create an environment in which workers can spend their time in Japan with a sense of security, by launching a helpdesk on daily matters for non-Japanese nationals, offering information through a portal site and providing Japanese language classes. Every year in Japan, JFE Engineering actively hires around 70 mid-career recruits possessing diverse characteristics and values, such as those with experience in other industries.

*1 The name was changed to the Sustainability System in FY2023.
*2 In FY2022, about 60 employees were accepted due to the impact of COVID-19, but this number is expected to gradually increase.

JFE Shoji

To promote company-wide awareness, JFE Shoji regularly holds diversity seminars for the management team, diversity management seminars targeting managers including those at Group companies, and e-learning for all employees. In addition, the Diversity Promotion Committee, comprising the management team, was established to share overall policies and achieve departmental targets. The company also supports the career development of female employees by providing a career training program for mid-career female employees together with their supervisors while holding roundtable discussions with senior employees and actively dispatching female employees to external training programs and activities.
To ensure that women can continue working after childbirth or periods of childcare or nursing care, the company organizes information exchange meetings for employees on maternity leave and follow-up seminars after they return to work. As part of efforts to encourage male employees to participate in childcare, we hold seminars on male childcare leave and provide explanations to department heads and to the employees.

Promoting Women's Professional Development

The JFE Group is implementing a broad range of initiatives to promote women's advancement, including active recruitment, enhanced childcare-support programs that significantly exceed statutory requirements, and development of training and awareness-raising activities. The initiatives and issues faced by each company are shared among operating companies. They are also discussed at the Board of Directors' and other meetings in an ongoing effort to promote the initiatives. In recognition of its efforts to encourage the empowerment of women, JFE Holdings has been selected three times as a Nadeshiko Brand* since FY2013.

* A joint project of the Ministry of Economy, Trade and Industry and the Tokyo Stock Exchange. One company per industry is selected from among those listed on the First Section of the Tokyo Stock Exchange and announced as a company that is actively promoting the careers of female employees , including improvements to environments where women can continue to work.

Formulation of an Action plan for Promoting Women's Professional Development

The Act on Promotion of Women's Participation and Advancement in the Workplace went into effect on April 1, 2016. The JFE Group has designated the promotion of workforce diversity as a key management strategy for maximizing the potential of every employee and has been actively hiring and supporting the advancement of female employees.

We formulated the following action plan in accordance with the Act to establish a working environment that encourages female employees to demonstrate their abilities and create satisfying workplaces for all employees.

- **Action Plan Period**
  Period of five years starting on April 1, 2021 and ending on March 31, 2026
- **Target of the Action Plan**
  We have set a common goal for the JFE Group to increase the ratio of women in managerial positions above the section manager level to at least 10% by 2030 (of which at least 20% are in administration and the sales divisions). Under this goal, we will actively promote the appointment of women to managerial positions.
- **Action Plan for Each Operation Company**

➤ JFE Steel (Japanese Only) (https://www.jfe-holdings.co.jp/csr/pdf/female_plan_st.pdf)
➤ JFE Engineering (Japanese Only) (https://www.jfe-holdings.co.jp/csr/pdf/female_plan_eng.pdf)
➤ JFE Shoji (Japanese Only) (https://www.jfe-holdings.co.jp/csr/pdf/female_plan_shoji.pdf)

Company Policy Explained by the President

The president of JFE Holdings has endorsed the Declaration on Action that was introduced by a group of male leaders in Japan who intend to create "A Society in which Women Shine" with the support of the government's Gender Equality Bureau Cabinet Office. He also announced additional measures to support the professional development of female personnel, thereby communicating both inside and outside the company that women can play active roles at JFE.

For more information, see:
➤ **Declaration on Action by a Group of Male Leaders Who Will Create a Society in Which Women Shine**
(https://www.gender.go.jp/policy/sokushin/male_leaders/pdf/declaration_body_en.pdf)

Employment of People with Disabilities

The JFE Group has three special subsidiaries, JFE Apple East Corporation, JFE Apple West Corporation and Mie Data Craft Co., Ltd., to employ people with disabilities and create enjoyable workplace environments for them.

For more on the employment of people with disabilities, see:
➤ **Data on Employment of People with Disabilities** (P.247)

Programs for Employees Over 60 Years Old

To ensure that the skills and experience of veteran employees are handed down, JFE Group companies have either raised the mandatory retirement age to 65 or introduced a system that enables all employees to work until the age of 65.
As of April 2023, 751 elderly employees (about 3.5% of the total) are working at JFE Steel, JFE Engineering, and JFE Shoji.

JFE Steel

JFE Steel raised its mandatory retirement age to 65 in April 2021 to increase the motivation of veteran employees in their work, pass on their techniques and skills, and steadily promote human resource development. While we used to rehire anyone who wished to continue working after reaching the age of 60, we recently established a personnel and wage system to cover all employees up to the age of 65.

JFE Engineering

JFE Engineering regards veteran employees as highly specialized experts in business and technical fields and expects them to play roles in maintaining and strengthening competitiveness while passing on their skills to the next generation of workers. To encourage their further success, we raised the retirement age to 65 in fiscal 2023.

JFE Shoji

JFE Shoji is mindful of creating an environment that allows veteran employees over 60 to continue working with high motivation, while also seeking to realize flexible workstyles and develop a healthy working environment. Employees may choose from a variety of working arrangements, including full-time employment, shortened workweeks, and shortened daily work hours in accordance with their lifestyles.

JFE Group Creating an Inclusive Workplace

The JFE Group is creating a workplace that does not discriminate on the basis of gender, sexual orientation or gender identity by conducting internal human rights seminars and position-specific curriculums. LGBTQ concerns have also been incorporated into the Group's compliance guidebook, which is distributed to all employees and used as a common reference during the annual Compliance Month of October toward nurturing greater understanding. JFE Steel has revised its benefit program to extend coverage to same-sex or de facto partners from FY2022 and holds program briefings and educational training sessions. At JFE Engineering, e-learning programs are offered to all employees, and seminars are held mainly for personnel in human resources.

Securing Diverse Human Resources

Recruitment Results for University Graduates (FY2023) and Mid-career Recruits (FY2022)

552 employees (total of three operating companies)

- Women in positions with prospects for promotion: 20.6% (77 out of 373)
  Women in white-collar positions: 31.5% (53 out of 168)
- Mid-career and year-round recruits: 30.3% (167 out of 552)
  Recruits in positions with prospects for promotion: 32.2% (120 out of 373)
  Recruits in on-site positions at steelworks: 26.3% (47 out of 179)

To ensure sustainable growth, the JFE Group steadfastly recruits from a diverse pool of applicants and actively hires women, foreign nationals and mid-career personnel, and recruits year-round.

The Group also operates overseas businesses across a broad range, and its overseas sites hire employees locally, thereby contributing to communities with employment opportunities.

■ Recruitment Results (Three Operating Companies) for University Graduates (FY2023) and Mid-career Recruits (FY2022)

Category	Career-track Positions			On-site and Clerical Positions	Total
	White-collar	Technical	Total		
Male	115	181	296	170	466
Female	53	24	77	9	86
Total	168	205	373	179	552
Ratio of women (%)	31.5	11.7	20.6	5.0	15.6

For more on employees, refer to the following data.

➤ Social Data (P.243)

Human Resource Development

The JFE Group is enhancing training and education with an emphasis on nurturing the capacities of each employee and cultivating global human resources to support the expansion of our overseas business. We are also committed to securing and developing the necessary human resources to promote the DX strategy, one of the JFE Group's management strategies. In FY2023, we are adding a new KPI for DX human resource development to the KPI for training hours per employee, to further accelerate our efforts.

JFE Steel

Passing on Skills and Promoting DX Human Resource Development

The generational replacement of employees has peaked, raising the urgency of boosting the skills of younger employees. Accordingly, the company applies an evaluation system at manufacturing sites to quantitatively grasp and analyze the skill level of each employee and then uses the results in its training system. It also promotes the use of IT such as a mixed reality technology-based training simulator for enhancing the quality of training.

Furthermore, the Group is taking steps to respond to DX technologies, which are rapidly being introduced and applied in industry, for such tasks as improving internal training programs for data scientist personnel. Starting in FY2023, we will provide DX literacy training to all employees to instill our vision and inform their thinking. We will also provide training that challenges the mindsets of executives and managers to guide them into specific goals that further promote human resource development.

JFE Engineering

Engineering Training Programs to Support Independent Learning

To enhance the knowledge of underlying technologies that represent a technological foundation for an engineering enterprise, the company's leading expert lectures over 30 different courses on basic technology for younger employees and mid-career hires.

A web-based learning curriculum launched in FY2018 offers employees opportunities to acquire business skills that cater to each job responsibility, including accounting and marketing.

Through these training programs, JFE Engineering provides younger employees with opportunities to grow through independent and continuous learning and strengthens the leadership capabilities of managers to transform corporate management.

JFE Shoji

Training and Measures to Maximize Employee Potential

To expand the trading business in Japan and overseas, JFE Shoji has organized a training program that enables personnel with diverse backgrounds to achieve growth in their respective work sites and business situations. The program includes a course for developing the basic skills required of trading company personnel, such as negotiation, finance and strategic thinking, and the trading business along with another course for newly hired mid-career employees. Furthermore, employees in rank-based training learn the roles and skills required for their new qualifications before being promoted, which enables them to advance their careers more quickly. Other programs include the early dispatch of young employees to overseas Group companies and conducting national staff training in which locally hired talented overseas employees are invited to the head office to further boost their abilities and motivation. These opportunities for a wide range of employees is intended to raise the performance of the entire Group.

Developing Global Personnel

In addition to hiring and developing non-Japanese for career-track positions in Japan and local personnel overseas, the JFE Group is enhancing programs for Japanese employees to gain overseas study and training. The Company is also developing younger employees through practical experience by dispatching them on overseas assignments.

■ **Global Personnel Development Programs**

	JFE Steel	JFE Engineering	JFE Shoji
Study abroad	○	○	○
Short-term overseas language training	○	—	○
Overseas assignments for younger employees	○	○	○
Dispatching engineers to international conferences	○	—	—
Training for local personnel at overseas sites	○	○	○
Practical training in Japan for non-Japanese personnel at overseas sites	—	○	○
Internship for international students	○	○	—

Developing Dynamic Working Environments

The JFE Group is developing dynamic working environments through sincere discussions with labor unions and conducting employee satisfaction surveys (engagement surveys) every year. These tools help us regularly monitor employee awareness, identify issues related to their job satisfaction, and consider countermeasures.

We also seek to reflect the results of the periodic corporate ethics surveys to create employee-friendly working environments.

JFE Steel

Recognizing that labor-management cooperation is essential for the company to fully tackle its business challenges, JFE Steel has established a strong relationship with its labor union based on understanding and trust. The company convenes its Labor-Management Business Discussion Committee four times a year to bring the president and other executives together with labor representatives for the purpose of exchanging ideas on business challenges. The two sides also share views on working conditions and workplaces and hold joint consultations whenever the labor system is revised.

JFE Engineering

JFE Engineering strives to ensure sound labor-management relations. In addition to Central Labor-management Committees, which are regularly convened for the company's president and other executives to share views with representatives of its labor union, a labor-management committee on work-life-balance helps to maintain friendly working environments.

JFE Shoji

JFE Shoji management and labor have jointly declared they will achieve continuous growth for the company, enhancing the lives of employees and realizing an affluent society based on mutual trust and understanding. The company maintains a sound relationship between management and labor. Semiannual Management Committee meetings are held as opportunities for the company president and other executives to regularly exchange opinions and share management information with representatives of the labor union.

Human Rights

Basic Policy

The JFE Group views respect for human rights as both a corporate social responsibility and a foundation of its business. Our determination to prevent discrimination in our business operations is clearly expressed in our Standards of Business Conduct, which we have consistently upheld. In FY2018, the JFE Group Human Rights Basic Policy was established as a standard to which Group companies and their officers and employees must comply in order to further clarify the approach to our initiatives. Under the policy, we also seek cooperation from all stakeholders including our supply chain to respect and protect human rights.

We have been conducting human rights due diligence since fiscal year 2021 in accordance with the United Nations Guiding Principles on Business and Human Rights, while organizing seminars by external experts on human rights. Given recent changes in human rights awareness and concerns, the JFE Group Human Rights Basic Policy was revised in April 2023 to further strengthen the JFE Group's efforts to respect human rights. Under the new version of the policy, every operating company inspected and revised its procurement guidelines and related materials, thereby strengthening the Group's efforts throughout the supply chain.

We will continue to promote initiatives for realizing a society in which human rights are respected and protected.

JFE Group Basic Policy on Human Rights

JFE hereby establishes the JFE Group's Basic Policy on Human Rights based on the United Nations Guiding Principles on Business and Human Rights in order to promote Group-wide efforts to respect human rights and to fulfill its responsibilities to all stakeholders that it influences in the course of its business activities.

1 . Basic approach to respect for human rights

We, the JFE group, support and respects the International Bill of Human Rights, which consists of the Universal Declaration of Human Rights and the International Covenants on Human Rights, as well as the International Labor Organization (ILO) Declaration on Fundamental Principles and Rights at Work.

We believe that respect for human rights is a corporate social responsibility and a foundational aspect of our operations. In addition to clearly stating and implementing our policy for respecting all members of the company and the general public and refraining from any form of discrimination in our corporate activities, we implement initiatives to ensure that we are not complicit in human rights abuses.

This policy represents our commitment to respect human rights based on the JFE Group Standards of Conduct.

2. Scope of application

This policy applies to all officers and employees of the JFE group. We also encourage all stakeholders, including members of our supply chain, to understand and support this policy.

3. Compliance with applicable laws

We comply with the laws and regulations of Japan and all other countries and regions where we operate, but if there is any conflict with internationally recognized human rights and regulations, we seek ways to respect internationally recognized human rights as much as possible.

4. Human rights due diligence

We identify negative impacts on human rights and utilize our internal mechanisms for human rights due diligence to prevent or mitigate such impacts.

5. Corrections and remedies

We maintain reporting contact points for receiving reports from both internal and external sources regarding negative impacts on human rights caused by any of our business activities. If we are made aware that we have caused or been involved in a negative impact on human rights, we will follow the necessary procedures to correct and remedy the problem.

6. Education

We provide education on respecting human rights to ensure that all of our officers and employees understand and implement the company's basic policy.

7. Oversight

The JFE Group Sustainability Council, chaired by the President of JFE Holdings, Inc., oversees compliance with this policy and the implementation status of initiatives referred to herein.

8. Dialogue and consultations with stakeholders

Among the initiatives taken under this policy, we utilize outside experts as well as engage in discussion and consultation with internal and external stakeholders.

9. Information disclosure

We appropriately disclose all relevant information about our initiatives concerning respect for human rights and the progress of such initiatives via JFE group websites and other means.

10. Business-related human rights issues

(1) Non-discrimination and equality under the law

We respect every individual connected with our corporate and business activities and do not discriminate on the basis of race, nationality, ethnicity, creed, religion, social status, lineage, age, gender, sexual orientation, gender identity, disability, or any other such factor.

(2) Engaging with business partners

We seek the cooperation of all of our business partners in initiatives to respect and protect human rights in order to contribute toward creating a society in which the rights of all humans are respected and protected.

(3) Harassment

We do not engage in any kind of harassment based on gender, status, or any other factors, including through language or behavior that offends or violates the dignity of others.

(4) Forced labor and child labor

We never use forced labor or child labor in any country or region. We also do not tolerate or sanction any form of modern slavery, including bonded labor and human trafficking.

(5) Occupational health & safety and appropriate working environments

In accordance with the fundamental idea that safety is our top priority above all else, we pursue health and safety in all of our activities and strive to create safe, healthy workplaces where all employees feel assured that their physical and mental health is protected.

(6) Working hours and livable wages

We comply with all laws and regulations concerning working hours and wages applicable in the countries and regions where we operate. We work to ensure wages that allow employees to enjoy an adequate standard of living.

(7) Right to freedom of association and collective bargaining

We respect employee rights to freely associate and collectively bargain in accordance with the laws and collective bargaining agreements in each country. In addition to taking into account each country's laws and labor practices, we work to build sound labor-management relations and resolve problems by engaging in sincere and constructive dialogue with employees in accordance with international norms.

(8) Rights of local and indigenous peoples

We respect and give due consideration to local people's land rights, access to water, safety and health as well as the rights of indigenous peoples in regions where we operate.

This policy revision was formulated with the assistance of human rights experts and approved at the JFE Group Sustainability Council chaired by the President of JFE Holdings, Inc.

Established: April 2018
Revised: April 2023
Koji Kakigi, Representative Director, President and CEO
JFE Holdings, Inc.

Structure

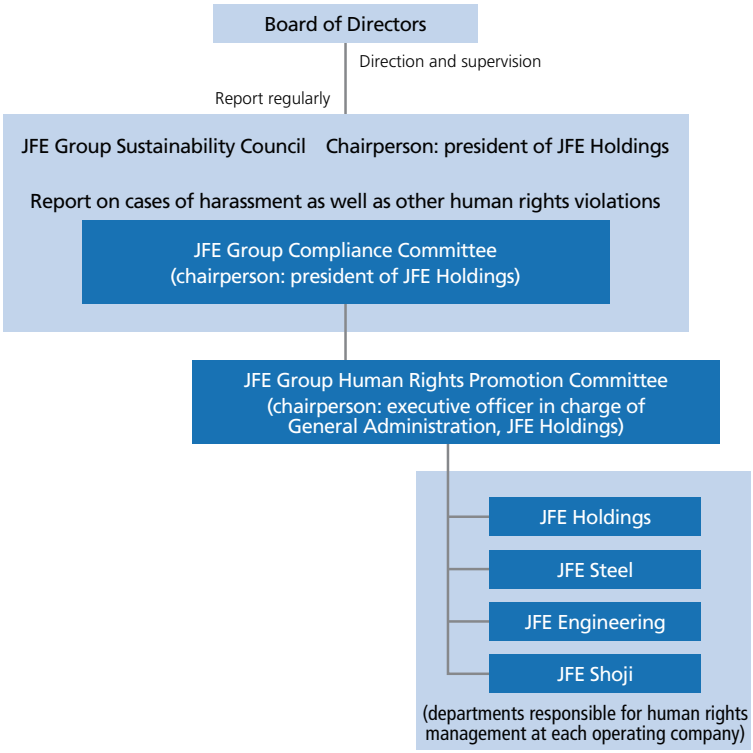
Promoting Human Rights

In order to steadfastly focus on human rights initiatives, we established the JFE Group Human Rights Promotion Council, chaired by the corporate officer of JFE Holdings under the JFE Group Compliance Committee, chaired by the president of JFE Holdings. This framework allows us to define Group-wide policies and regularly share information with departments responsible for human rights issues that have been set up at each operating company.

In addressing all human rights risks, we emphasize communicating with stakeholders through such initiatives as setting up a Corporate Ethics Hotline at each operating company and an independent law firm as an external contact point, as well as dedicated consultation desks on harassment issues at major offices, all of which accept anonymous reporting and consultation on human rights and related issues. Furthermore, we receive inquiries, including anonymous requests concerning human rights issues and compliance from external stakeholders via the contact form on our corporate website. The operational status of these help desks and reports of harassment as well as other human rights violations are regularly reported to the JFE Group Sustainability Council and Board of Directors for their direction and supervision.

➤ Development of the Whistleblowing System (P.217)

■ Governance Structure for Human Rights Awareness Promotion



Targets and Results

Recognizing that contributing to the realization of a society in which the human rights of each and every individual are respected and protected is not only a corporate social responsibility but also a foundational principle of management, the JFE Group upholds respect for human rights across the supply chain as a key management issue and promotes its efforts by setting KPIs.

➤ Material Issues of Corporate Management and KPIs (P.20)

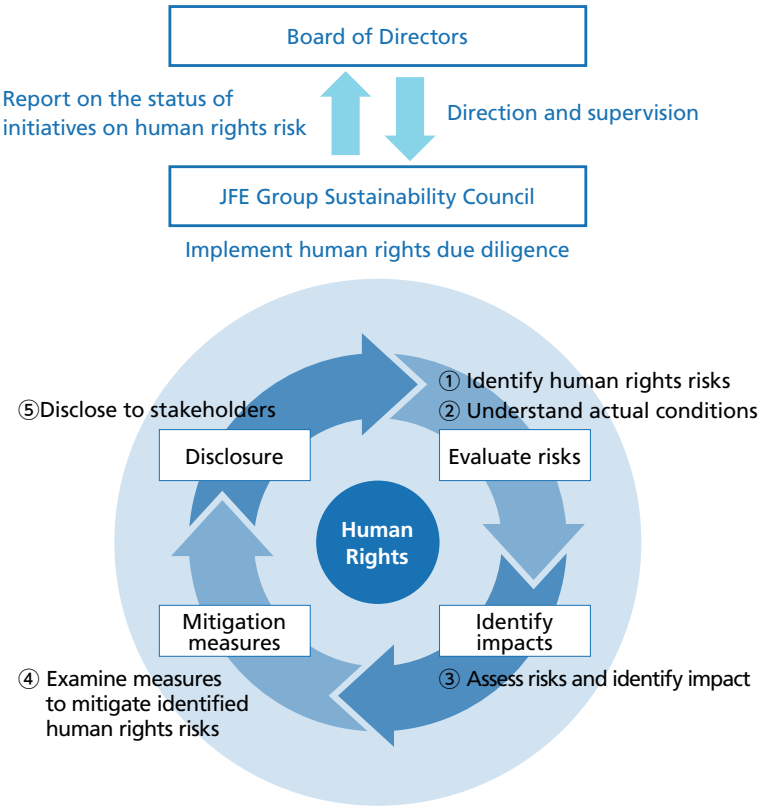
Human Rights Due Diligence

The JFE Group is committed to human rights due diligence based on the United Nations Guiding Principles on Business and Human Rights. In FY2021, the year when human rights due diligence was initiated, we identified human rights risks and examined corrective measures to be taken at the JFE Holdings and other Group companies, including operating companies. In FY2022, we revised the JFE Group Human Rights Basic Policy (hereinafter "the Policy"), and every operating company also inspected and revised their procurement guidelines in line with the policy to further strengthen our efforts to respect human rights throughout the JFE Group and its supply chain. Additionally, we discussed the method, scope, and priorities for conducting a survey on human rights risks throughout the supply chain. We are expanding our efforts by holding briefings on human rights and conducting surveys on related risks to ensure that Group companies identify, assess, reduce, and prevent human rights risks.

In FY2023, we will conduct a questionnaire survey on human rights risks with suppliers to ensure respect for human rights across the supply chain. We will also gradually expand our efforts at Group companies.

Human Rights Due Diligence Process

■ Human Rights Due Diligence Process



❶ Identify human rights risks

We created a long list of human rights risks by referring to international norms and guidelines and seeking advice from external human rights experts. Then, taking into account human rights risks specific to the industry, regional characteristics, and other relevant factors, we identified human rights risks related to the Group's supply chain by stakeholder, such as employees and suppliers, including women, children, and local residents.

International norms and guidelines referenced:
United Nations Guiding Principles on Business and Human Rights, International Bill of Human Rights, ILO's Core Labor Standards, OECD Guidelines for Multinational Enterprises, Ten Principles of the UN Global Compact, GRI Standards, FLA Workplace Code of Conduct, and CHRB Key Industry Risks

15 human rights issues to consider:

Compliance with standards and guidelines for respect for human rights demanded by international norms	Avoiding complicity in human rights abuses, compliance, social security, and fair competition	Prohibition of discrimination and equality before the law
Access to remedy	Thorough supplier management	Harassment and abuse
Women's rights	Child labor	Forced labor
Occupational health and safety	Working hours	Appropriate working environment
Wages that guarantee a decent standard of living	Freedom of association and the right to collective bargaining	Rights of indigenous and local people

❷ Investigate current status

We ascertained the current status of the risk management system and activities by examining our disclosure of policies on child labor, forced labor and various other human rights risks, such as the JFE Group Human Rights Basic Policy and the Basic Procurement Policy of each company, our whistleblowing system for ensuring access to remedial action, our initiatives on compliance including prevention of corruption, and other initiatives, systems and rules concerning internal and external human rights issues.

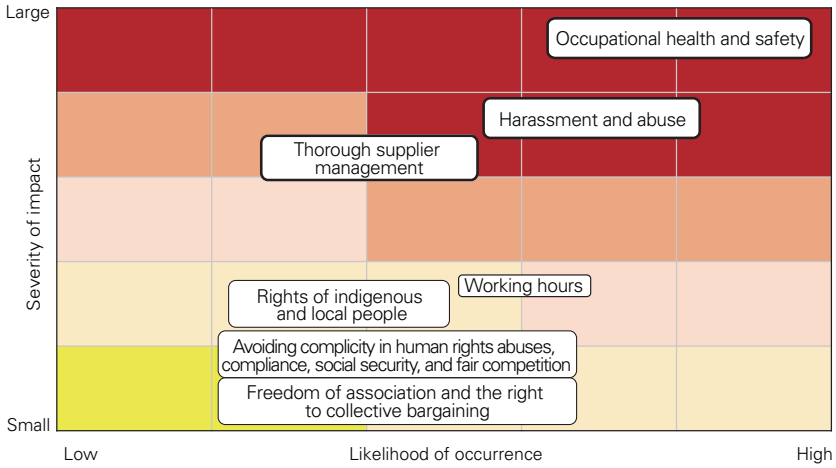
❸ Assess risks and determine impacts

We assessed the risks of the identified human rights issues to be considered, based on the severity of impact and likelihood of occurrence, and determined the status of our initiatives on respecting human rights through written surveys and interviews in order to better identify that status in our future endeavors. During the risk assessment, we also determined the adverse impacts of human rights risks on the JFE Group and its stakeholders.

Human rights risks identified as particularly high risk and requiring action:

- Occupational health and safety
- Harassment and abuse
- Thorough supplier management (establishment of a human rights risk management system for the entire supply chain)

■ **Map of Key Human Rights Risks**



❹ Consider mitigation measures for identified human rights risks

We implement mitigation measures for the identified human rights risks, including response as well as preventive and corrective measures and promotion systems. For occupational health and safety and harassment, we continue to strengthen our efforts to eliminate accidents and harassment using KPIs. To create a sustainable and resilient supply chain, we are establishing a human rights risk management system encompassing the entire supply chain. We will also conduct surveys on the human rights risks of suppliers by determining the priority of the surveys based on the severity of the impact of such risks and the likelihood of their occurrence.

➤ Material Issues of Corporate Management and KPIs (P.20)

❺ Information disclosure to stakeholders

The JFE Group Human Rights Basic Policy, guidelines for procurement at each operating company, and other information are disclosed on our website. Also, we will appropriately disclose Information on our initiatives to respect human rights, including human rights due diligence, and their status to our stakeholders.

FY2022 Initiatives

Inspect and Revise the JFE Group Human Rights Basic Policy

The JFE Group views respect for human rights as both a corporate social responsibility and a foundation of its business. Our determination to prevent discrimination in our business activities is clearly expressed in our Standards of Business Conduct, which we have consistently upheld throughout our operations. Given recent changes in public awareness and concerns related to human rights, we revised the JFE Group Human Rights Basic Policy, established in 2018, to further strengthen our efforts to respect human rights throughout the JFE Group and supply chain. We will steadfastly promote Group-wide efforts to respect human rights for all stakeholders, including suppliers, customers, and employees, toward realizing a society in which human rights are respected and protected.

Expand Human Rights Due Diligence to Group Companies

We have held briefings on human rights for approximately 70 Group companies and conducted fact-finding surveys thought writings and interviews at 14 Group companies so far. From the survey results, we identified priority issues and considered measures to reduce and prevent human rights risks, thereby promoting human rights due diligence throughout the Group.

Establish human rights risk management system for suppliers

We inspected and revised the procurement-related guidelines, based on the revised JFE Group Human Rights Basic Policy, and related material established by each operating company. In addition, considering the severity of impact and likelihood of occurrence of human rights risks, we determined the priorities for supplier surveys and prepared a questionnaire survey on human rights risks.

Future Initiatives

We will continue to implement initiatives to correct and mitigate identified human rights risks and take the following actions to expand our human rights due diligence.

Expand Human Rights Due Diligence to Group Companies

In FY2023, we will conduct new surveys on human rights risks at approximately 80 major Group companies in Japan. We will also continue to support Group companies that have already participated in the survey to correct and improve their human rights risks, and we will consider how to conduct periodic risk surveys and review progress.

We will also consider priorities and methods for conducting fact-finding surveys of our overseas Group companies.

Establish human rights risk management system for suppliers

We will continue to inform suppliers of the revised JFE Group Human Rights Basic Policy, guidelines, and other references. Furthermore, we will conduct a questionnaire survey on human rights risks for approximately 600 high-priority suppliers and support specific improvements based on their responses.

Consistently maintaining these initiatives will establish a system for reducing human rights risks throughout the entire supply chain. We will also assess and improve our initiatives for respecting human rights under the supervision of the JFE Group Sustainability Council and Board of Directors to increase their effectiveness.

Human Rights Promoting Activities

To consistently maintain our activities to respect human rights and raise employee awareness, we conduct human rights training courses, offer guaranteed equal employment opportunities, promote fair human-resource management, and actively prevent workplace harassment. Our training courses encourage employees to develop a thorough understanding of the JFE Group Human Rights Basic Policy and the respect for human rights expected of a company in the international community. To this end, we continuously monitor and following up on seminars against a KPI focused on attendance rate (attendance rate in FY2022: 100%).

We seek to prevent sexual harassment, the abuse of power, and other forms of harassment by addressing these issues in company regulations, displaying posters in workplaces, and organizing training by position (including management), individual offices, and executives. In addition, we invited an outside attorney to conduct a seminar on corporate ethics hotlines and harassment consultation desk staff (those who receive reports, including management) within the JFE Group. We regularly organize these training sessions for hotline and consultation desk personnel and held a workshop on the revised Whistleblower Protection Act in FY2022 (participants: approx. 200 in FY2020 and approx. 300 in FY2022).

Furthermore, we actively support and take part in initiatives undertaken by public organizations and groups promoting human rights as well as groups in which private enterprises participate, such as the Industrial Federation for Human Rights, Tokyo and the Corporate Federation for Dowa and Human Rights Issue, Osaka. By attending seminars and workshops sponsored or supported by such organizations and groups, we have become increasingly aware of human rights trends and challenges as well as issues specific to Japanese business. We then apply this knowledge in JFE human-rights awareness training programs and related initiatives.

Respecting the Rights of Workers

The JFE Group adheres to the laws and regulations of various countries as well as collective agreements. It also respects the rights to freedom of association as well as their right to collective bargaining.

Upper management, including the president and the representative of the union, meets regularly to discuss matters such as management issues, work life-balance, working environments, and working conditions. By conducting earnest labor-management consultations, we strive to create a vigorous workplace while working to maintain healthy and sound labor-management relations.

The JFE Group complies with laws and regulations related to salary payments and sets salaries above the minimum wage designated by country, region and industry sector. In addition to meeting legal requirements concerning the upper limits for overtime and other mandates, the JFE Group establishes challenging and satisfying working environments by providing our employees with one of the top levels of employment conditions in the industry as well as performance-based bonuses linked to company profits.

We regularly review the wage situation in each region and business sector and engage in honest discussions with the labor union to ensure a fair return to our employees while also paying due consideration to management and business performance.

Respect for Freedom of Expression

The JFE Group upholds basic human rights in its Human Rights Basic Policy and is committed to respecting and protecting the human rights of each individual throughout its corporate activities. We pay due care to prevent violations of the freedom of expression, as recognized by the International Covenant on Human Rights and other international conventions, and to fully protect the right to privacy.

Respect for Children's Rights

The JFE Group supports the Convention on the Rights of the Child and Children's Rights and Business Principles and will seek to eliminate child labor and respect every child's right to survival, right to development, right to protection and the right to participation, the four pillars of the Convention on the Rights of the Child.

The JFE Group Human Rights Basic Policy upholds recognizing the diverse values held by each individual in all aspects of corporate activity as well as respecting and protecting the human rights of each person in compliance with international conventions. It also explicitly prohibits child labor and forced labor. To promote concrete initiatives, the JFE Group has focused on nurturing the next generation as a key area of its public service and is engaged in activities that support the sound development of younger generations.

Respecting Human Rights across the Supply Chain

JFE Steel

Following the JFE Group Human Rights Basic Policy, JFE Steel reviewed the previous Raw Material Purchasing Policy and Materials & Machinery Purchasing Policy as well as CSR Procurement Guidelines and established the new JFE Steel Procurement Guidelines, which incorporate more extensive and specific information on sustainability in general, in addition to respect for human rights. To promote sustainability initiatives throughout the supply chain, we ask our suppliers to comply with these guidelines, which are also disclosed on our website.

In terms of raw material procurement in particular, there is concern that conflict minerals, such as tin, tantalum, tungsten, gold, and cobalt, provide a funding source for militias causing human rights violations and environmental destruction. Therefore, JFE Steel complies with Japanese and overseas regulations governing the responsible procurement of minerals as well as international rules and investigates and confirms with suppliers that they are not selling conflict minerals before we purchase from them.

For JFE Steel Procurement Guidelines, please refer to the following.

➤ **JFE Steel Procurement Guidelines** (https://www.jfe-steel.co.jp/en/company/purchase_policy.html#to-our-business-partners)

JFE Engineering

JFE Engineering is promoting sustainable procurement in accordance with its Purchasing and Procurement Policies to promote initiatives related to respect for human rights in cooperation with suppliers. In addition, JFE Engineering asks suppliers to respect basic human rights, eliminate all forms of discrimination, and strive to create a safe and comfortable working environment by establishing procurement guidelines while observing laws, regulations, and social norms in their business activities. JFE Engineering ensures that these policies are clearly communicated throughout the supply chain by publicizing them on the company's website.

For JFE Engineering's Procurement Policy and Procurement Guidelines, please refer to the following.

- **Procurement Policy** (https://www.jfe-eng.co.jp/en/information/procurement_policy.html)
- **Procurement Guidelines** (https://www.jfe-eng.co.jp/en/information/procurement_policy.html)

JFE Shoji

JFE Shoji established the Basic Policy on Sustainability in the Supply Chain, which consists of eight items, including respect for human rights, prohibition of discrimination, prohibition of forced labor and child labor. It requests the understanding and cooperation of its suppliers in complying with this policy. In 2021, it signed the Ten Principles of the UN Global Compact, recognized by the international community as advocating universal values in areas such as human rights and labor.

For JFE Shoji's Basic Policy on Sustainability in the Supply Chain, please refer to the following.

- **Basic Policy on Sustainability in the Supply Chain** (https://www.jfe-shoji.co.jp/en/sustainability/promote/)

Community

Basic Policy

We are engaged in corporate activities across the globe. Continuing to do business requires that we forge relationships of trust with local communities and realize sustainable growth together by contributing to the development of each region in which we operate as well as by pursuing development at manufacturing sites where our steelworks are located. To this end, the JFE Group is committed to working with communities as stated in the JFE Standards of Business Conduct and is promoting activities that contribute to local communities.

The operation of our steelworks involves massive production facilities and significantly impact the region's employment and economy as well as environmental air and water quality. Our steel business seeks to revitalize local communities as an important means for deepening understanding of the JFE Group among local residents and mutually promoting regional development.

JFE Group Standards of Business Conduct

3 Work with communities

Actively contribute to host communities as a good corporate citizen by emphasizing harmony and cooperation.

Initiatives

Local Activities

In addition to consistently taking action to ensure safety and reduce the environmental impact of our corporate operations, we also conduct initiatives that serve the public with a focus on protecting the environment, nurturing the next generation, promoting sports and culture, and revitalizing regional communities.

Furthermore, we provide paid leave programs that can be used to promote volunteer work to encourage the active participation of employees.

Opening Manufacturing Sites to the Public

Every year, the JFE Group opens its manufacturing facilities to residents in local host communities for demonstrations, tours and other events.

■ On-site Events in FY2022*

	Location	Event	Date	Attendance
JFE Steel	East Japan Works, Keihin	Keihin Community Festival	May 29	950
	East Japan Works, Chiba	JFE Chiba Festival	October 23	20,000
	West Japan Works, Fukuyama	JFE West Japan Festival in Fukuyama	May 8	7,000
	West Japan Works, Kurashiki	JFE West Japan Festival in Kurashiki	November 3	9,000
	Chita Works	Handa Community Industrial Festival	November 9	15,000

* Events were held with measures in place to prevent the spread of COVID-19.

JFE West Japan Festival in Fukuyama

In addition, on-site recreational facilities are made available for community sports such as soccer, baseball, volleyball and basketball as well as other events sponsored by Group companies. Coaching sessions are offered by company baseball and track teams, which compete in Japan's top-level corporate leagues. Such activities promote sports and health as well as stronger relationships with host communities.

JFE Steel

Tour of Steelworks

Every year, JFE Steel invites over 100,000 guests*, mostly elementary and junior high school students from host communities, to tour steel production sites at each steelwork, in conjunction with festivals and other events.

*In FY2022, we received visitors (about 70,000) after reducing the size of the tours and implementing adequate measures for preventing the spread of COVID-19.

Education at Elementary Schools

JFE Steel conducts plant tours for students at nearby elementary and junior high schools. In addition, company employees visit schools to give lectures on iron and steelmaking processes, the features of steelworks, environmental initiatives, and other topics to deepen understanding of the steel industry and career opportunities. In FY2022, these lectures have been given to over 397 students in 39 classes, bringing the total to 309 classes since these began in FY2012. In FY2017, the company conducted the first class at a school for hearing impaired children.

Visiting lecturer at Samugawa Elementary School in Chiba City

JFE Engineering

Establishment of a System for Promoting Social Co-existence Activities

In FY2022, JFE Engineering established the Social Co-existence Committee, chaired by the president, to bolster social initiatives and enhance its contribution to realizing a sustainable society in accordance with the JFE Group Standards of Business Conduct. Under the policies set by JFE Engineering, the scope of committee activities encompasses initiatives implemented through its businesses as well as those for resolving social issues not covered by business activities, while the four themes of the environment, disaster prevention, local communities, and nurturing the next generation are designated as the key areas. Collaborating with local communities is essential for the company, which operates businesses in various locations. Nurturing the next generation is in line with JFE Engineering's stated purpose of strongly supporting people's daily lives and passing community strengths on to future generations . Under the system, leaders have been assigned in each organization to promote activities across the company.

In FY2023, the company laid out guidelines for its system in order to set the stage for its activities. In addition, it designed an original logo and selected a catchphrase from entries submitted by employees to spread awareness and promote employee participation. The logo combines a circle of smiling faces created by the employee activities and the silhouette of a gear wheel that symbolizes the technology in JFE Engineering's business. It was designed to help people of all ages understand what the company does. The catchphrase conveys the message that JFE Engineering will work hand in hand with various stakeholders to care for society and live well into the future.

In addition to its various initiatives, JFE Engineering will further strengthen its activities by expanding opportunities for employees to participate and by providing education to deepen understanding of the concept of social co-existence.

みんなと創る
みんなで生きる

Environmental Protection Activities in the Kumozu River Basin in Mie Prefecture

JFE Engineering is the founding member of a committee set up in 2008 for protecting the environment in the Kumozu River basin in Mie Prefecture, including Tsu City, where the company's Tsu Works is located. Together with the local forestry and fisheries cooperatives, which are also members, and with support from Tsu City, the committee conducts river cleanups and tree planting activities in the river basin, as well as beach cleanups at the mouth of the river and public environmental education, in which employees and their families participate.

Facility Tours and School Lectures

JFE Engineering accepts visitors, mainly children from neighboring communities, and gives them tours of the works, construction sites, and incineration plants it manages under contract. The company also dispatches its employees to schools to provide lectures on the environment and other topics.

For example, a lecture on the environment and recycling was given to around 80 second-year students at the Junior High School Attached to Yokohama Science Frontier High School near JFE Engineering's Yokohama Head Office, followed by a visit to the Yokohama Head Office. Students learn through both classroom lectures and on-site experience by touring a food recycling plant operated by a Group company and the Global Remote Center , which remotely monitors incineration plants. This initiative has been implemented for five consecutive years since its launch in 2018.

Lecture at the Junior High School Attached to Yokohama Science Frontier High School

Support for External Organizations

Contributing to the realization of a sustainable society is a key management concern for the JFE Group, which actively seeks to address issues in collaboration with external groups and NGOs in pursuing solutions for the 17 SDGs.

UN World Food Programme

The JFE Group seeks to resolve the global hunger issue by supporting the cause and activities of the Japan Association for the World Food Programme*.

*An NPO-accredited supporter of the UN World Food Programme (WFP), which works to eliminate hunger and poverty.

Supporting Training for Foreign Medical Professionals

The JFE Group supports the Japanese Council for Medical Training, spearheaded by the Toranomon Hospital in Tokyo. The council offers a training program in which doctors from developing countries, primarily in Southeast Asia, are invited to study in Japan. The program aims to make an international contribution by training participants in Japan's advanced medical practices so trainees can apply their results to raise the medical standards of their home countries and to foster stronger relationships between those nations and Japan. The program also contributes to resolving health issues in local communities by enhancing the medical standards of those countries.

For more information, please refer to the following.

➤ JCMT (http://www.jcmt.jp/english/)

Japanese Foundation for Cancer Research

Since its establishment in 1908, the Japanese Foundation for Cancer Research has upheld its basic philosophy of aiming to improve the well-being of people everywhere by achieving better cancer control. The JFE Group supports this foundation, which has played a leading role in research and treatment as well as human resource development in Japan.

Fund to Support Children's Future

The JFE Group endorses the Japanese government's national campaign for creating a society in which every child can grow with dreams and hopes. The Group supports the Fund to Support Children's Future, which provides assistance to NPOs and other groups engaged in activities to eliminate poverty throughout Japan.

Support for Youth Development

Japanese Language Speech Contest

The JFE Group supports the All-China Japanese Speech Contest for university students in China as a way to promote stronger international exchange. The contest has been held since 2006 to further Japan-China relations through language and communication, and JFE has provided support from its launch. Through this activity, the JFE Group contributes to the development of Japanese language education in China and the promotion of friendly exchanges between the two countries.

Career Education for Students

JFE Steel and JFE Engineering provide plant tours for female junior high school, high school and university students to encourage them to pursue careers in science and technology.

Since 2006, JFE Steel has participated in the Keizai Koho Center's "Business Training for Japanese School Teachers." Teachers from primary, junior high and high schools learn about business operations, human resource development, safety and environment-protection-related initiatives, among other topics, with the intention of sharing that knowledge with their students and leveraging it for better school management. In addition, some facilities invite local junior high students and host work-experience sessions.

As part of career education for high school and junior high school students, Kawasho Foods Corporation, a member of the JFE Shoji group, cooperates with the School Support Center, a specified Nonprofit Corporation, to invite students for training. The participants learn how society is supported by specific kinds of work as well as the products and services related to such work.

Business training for schoolteachers

FY2022 Internships

The JFE Group annually hosts many trainees and interns from overseas to help them gain practical experience at plants as well as design and construction sites. They also participate in group work.

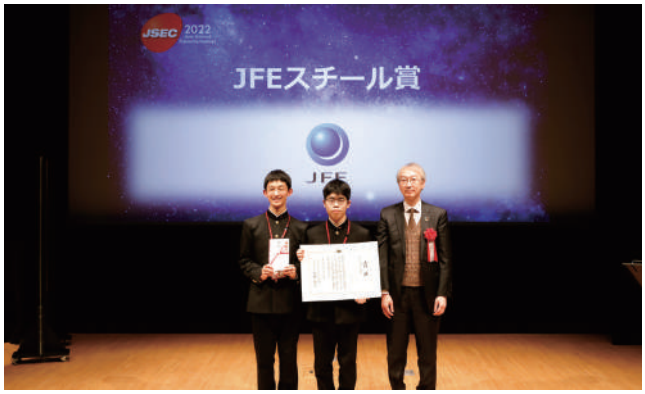
■ Number of Interns Accepted by Each Operating Company (FY2022)

JFE Steel	JFE Engineering	JFE Shoji
455 (desk work: 270, technical: 185)	631 (desk work: 163, technical: 468)	Approx. 345

JFE Steel

High School Science and Engineering Contest

The Japan Science & Engineering Challenge is a national science-paper contest for high school and technical college students. Under the sponsorship of the Asahi Shimbun Company and TV Asahi Corporation, the contest has been supported by JFE Steel since 2006 to nurture future scientists and engineers.



JFE Steel Award presented to two students from Yamaguchi Prefectural Tokuyama Senior High School

JFE Shoji

Supporting Elementary Schools in Ghana and Nigeria

As part of its sustainability efforts, the JFE Shoji Group has been conducting annual donation campaigns in Ghana and Nigeria since 2011. The donations take into account local needs, and JFE Shoji mainly selects products it manufactures locally to contribute to the economic activities of the two countries. This year for the twelfth donation campaign, the JFE Shoji Group donated 12,500 cans of GEISHA brand canned mackerel with tomato sauce, 475 sets of desks and chairs, and 17,000 notebooks to 15 schools in the two countries. School officials and local government agencies expressed gratitude for the donations.

The JFE Shoji Group will continue to provide support for food and education into the future, as a project that symbolizes the Group's commitment.

Students at an elementary school in Ghana

Supporting Off-Campus Training by Special-Needs Schools

The JFE Shoji Group has been providing off-campus training opportunities for students at schools for special needs since FY2017. Training mainly consists of gaining work experience by serving coffee, cleaning up, and learning about distribution by introducing and selling sweets and coffee shop goods produced at their schools.

As a company that values open relationships with society, JFE Shoji will continue to support self-reliance and social participation so that people with disabilities can lead vibrant lives in their own way.

JFE 21st Century Foundation

The JFE 21st Century Foundation was founded in 1990 through a donation from the JFE Group (the former Kawasaki Steel) to operate as a public-service corporation that contributes to society. It engages in various public services, such as supporting research at universities and cultural development.

- **Issued technical research grants (steel-related technology, global environment, technology for preventing global warming)**
- **Issued grants for Asian historical research**
- **Published and donated textbooks for universities and publications related to steel**
- **Sponsored cultural activities in communities hosting steel facilities**
- **Held Overseas Literary Contest and donated literary works**

For more on the JFE 21st Century Foundation, refer to the following information.

- JFE 21st Century Foundation (http://www.jfe-21st-cf.or.jp/eng/)
- Data related to the JFE 21st Century Foundation (P. 248)

Support for Technology Research

The foundation has been highly acclaimed by many universities for its support of technology research since FY1991.

In FY2022 , it fielded 103 grant requests and provided a total of 56 million yen in the form of grants valued at 2 million yen each for 13 projects involving iron and steel technologies and 15 projects related to environmental technologies, including those designed to prevent global warming.

Support for Asian History Studies

The foundation began awarding grants in support of Asian history studies at Japanese universities in FY2005. In FY2022, 44 applications were received and 12 grants worth 1.5 million yen each were awarded, bringing the total to 18 million yen.

Support Activities in Communities Hosting Steel Facilities

The foundation financially sponsors community cultural activities including music, art, traditional events, community revitalization, community activities and the conservation of cultural property.

In FY2022 , it sponsored nine events in regions across Japan where the Group operates its steel business, including Chiba, Kawasaki and Fukuyama cities.

Supporting the Japan Overseas Educational Services Writing Contest and Anthology Donation

The Japan Overseas Educational Services organizes contests in the areas of essays, poems, tanka and haiku for Japanese students attending elementary and middle schools overseas. The JFE Group has been cosponsoring the contest by offering JFE 21st Century Foundation prizes since FY1991. The foundation also donated 2,300 copies of Chikyu ni Manabu (Learn from the Earth), a collection of the winning entries, again in FY2022, to 690 organizations, including elementary and middle schools and public libraries located in the regions where the Group operates its steel business.

List of Social-contribution Activities

Local Communities and Society

- Supported World Food Programme
- Supported Japanese Foundation for Cancer Research
- Gave plant tours
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-01)
- Held festivals and events
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-02)
- Donated to Japan National Council of Social Welfare
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-03)
- Donated emergency food supplies to a food bank (Japanese Only)
  (https://www.jfe-steel.co.jp/company/csr.html#anc01-04)
- Lectured at elementary schools
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-04)
- Joined local cleanup activities
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-05)
- Conducted disaster response and prevention activities with local governments
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-06)
- Implemented and promoted Active Exercise®
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-07)
- Launched on-site daycare centers for local residents
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-08)
- Organized on-premise blood donation campaigns (Japanese Only)
  (https://www.jfe-steel.co.jp/company/csr.html#anc01-10)
- Cooperated with traditional events
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-09)
- Joined Nishinomiya tourism event
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-10)
- Held Manufacturing Class for children
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc01-11)
- Donation for Fukuyama Castle 400th Anniversary Project
  https://www.jfe-steel.co.jp/en/company/csr.html)
- Sponsored children's eco activities under World Food Programme
- Supported local festivals
- Organized public viewing of "Dragonfly Street" and Station Square
- Joined Where Do Dragonflies Fly Forum
- Supported Tsurumi Line stamp rally
- Volunteered for Kasumigaura Marathon
- Volunteered for disaster reconstruction
- Organized in-house fairs for supporting post-disaster reconstruction in Fukushima (providing meals at a cafeteria using local ingredients)
- Participated in tree planting to invigorate a rainforest in the Philippines
- Supported the holding and operation of the Okadama Aozora Market in Sapporo
- Organized environmental events at a contracted incineration plant
- Signed an agreement with the local government on opening up the contracted incineration plant as an evacuation site in the event of a disaster and providing emergency supplies

Nurturing the Next Generation

- Supported Chinese students' Japanese speech contest
- Supported Japanese Council for Medical Training
- Supported Welfare and Medical Service Agency's Children's Future Support Fund
- Supporting technician education at universities in Vietnam and Myanmar
  (https://www.jfe-steel.co.jp/en/company/csr.html)
- Organized internships
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc03-02)
- Supported Japan Science & Engineering Challenge
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc03-03)
- Supported career education
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc03-05)
- Accepted teachers for private-sector training
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc03-06)
- Supported Females in choosing Science or Engineering careers
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc03-07)
- Certified as company supporting child rearing (Kanagawa Prefecture and Nagoya City)
- Certified as Work-Life Balance Business (Kanagawa Prefecture)
- Accepted foreign technical interns (welding training)
- Supported elementary schools in Ghana and Nigeria
- Supported off-campus training by special-needs schools
- Supported robotics competitions for high schools in Mie Prefecture
- Provided welding training for technical high school teachers

Environmental Protection

- Organized firefly larvae release and viewing party
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc04-01)
- Held environmental exhibitions
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc04-02)
- Eco-purposed steel slag
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc04-04)
- Addressing the plastic waste problem through the development of a steel drinking container (Japanese Only)
  (https://www.jfe-steel.co.jp/company/csr.html#anc04-04)
- **Donated PET bottle caps**
- **Cooperated with nonprofit Green Bird in volunteer garbage collection**

Sports and Cultural Promotion

- Held local sporting events
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc02-01)
- Sponsored Cho Chikun Go Cup
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc02-03)
- Sponsored Cho Chikun Go Cup
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc02-03)
- Promoted parasports
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc02-04)
- Keihin Symphonic Band gave performances
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc02-05)

Contribution to Local Communities through the Engineering Business

We contribute to realizing a circular economy in local communities by providing utility services, such as electricity, gas, and water, as well as combining our businesses in plastics and food recycling, renewable energy power generation, and waste-to-energy power generation.

- Development and Provision of Eco-friendly Processes and Products (P.108)

Shareholders and Investors

Basic Policy

Shareholder and Investor Relations Policies

JFE Group Standards of Business Conduct

2 Be open to society

Proactively disclose corporate information and engage in constructive dialogues with diverse stakeholders to enhance our corporate value.

Returns to Shareholders

The JFE Group regards returning profits to shareholders as a top management concern and follows the basic policy of actively paying dividends while establishing a sustainable and highly profitable structure for the Group as a whole, investing in growth, and improving its financial position. The Group's basic policy under the Seventh Medium-term Business Plan is to achieve a payout ratio of about 30%.

General Meetings of Shareholders

General meetings of shareholders are opportunities for dialogue with shareholders, so JFE sends invitations at the earliest possible date to maximize attendance and avoid overlapping with the shareholder meetings of other companies. The company has been posting an invitation on its website at the earliest possible date while allowing online voting for shareholders who are unable to attend. JFE also strives to provide the same information to overseas investors as it does in Japan by, for example, disclosing the convocation notice in English.

For more information on the General Meetings of Shareholders, please refer to the following.

➤ General Meetings of Shareholders (https://www.jfe-holdings.co.jp/en/investor/stock/general_meeting/index.html)

Policy on Constructive Dialogue with Shareholders and Investors

The JFE Group endeavors to enhance corporate value sustainably through dialogues with shareholders and investors, and it has established the Investor Relations and Corporate Communications Department to be responsible for promoting such constructive dialogue. The director supervising the department and director in charge are also responsible for promoting constructive dialogues with shareholders and investors, and the department takes the lead in ensuring organic collaboration between relevant departments by appropriately sharing information.

To promote active dialogue, JFE holds various briefings for institutional investors, including announcements of medium-term business plans and financial results by executive directors, and also arranges for visits to investors in Japan and overseas. With regard to individual shareholders and investors, JFE organizes briefings on corporate activity and tours of plants and other sites. Opinions, questions, and other information obtained through these dialogues are regularly collected and reported to directors, Audit & Supervisory Board members, and corporate officers.

In conducting the dialogues, JFE prevents any leaks of insider information and ensures fair disclosure by adhering to its disclosure policy. In addition, important press releases and IR materials are disclosed in English to provide the same information to overseas investors as to those in Japan.

For more on this, please refer to the following information.

- **Investor information** (https://www.jfe-holdings.co.jp/en/investor/index.html)
- **Plant tours (special benefit for shareholders) (Japanese only)** (https://www.jfe-holdings.co.jp/investor/stock/factory_tour/index.html)
- **Disclosure policy** (https://www.jfe-holdings.co.jp/en/investor/management/disclosure-policy/index.html)
- **Major IR Activities** (P.248)

Governance: Executive Summary

With its many companies and partners, the JFE Group is engaged in a broad and diverse range of businesses, centered on the steel, engineering, and trading businesses.

Establishing a proper governance system is essential for increasing the autonomy and efficiency of each operating company and for appropriately managing various business risks, including those related to the environment, safety, and disaster prevention. It is also important for ensuring the Group's sustainable growth and improving corporate value over the medium to long term.

We have been enhancing corporate governance through such initiatives as formulating the Basic Policy on Corporate Governance, establishing the Nomination Committee and Remuneration Committee, introducing a stock remuneration system for Directors , and evaluating the effectiveness of the Board of Directors. In FY2022, we introduced indicators for employee safety in order to use non-financial metrics related to the environment, society, and other aspects for performance-linked remuneration for Directors. In FY2023, we introduced indicators related to climate change as an incentive to accelerate our ability to tackle issues related to that concern. We will continue to improve our remuneration system for Directors to provide stronger incentives with a higher level of integrity and drive sustainable growth.

Thorough compliance is the foundation of our relationship of trust with stakeholders and the basis of our business activities. While we strive to ensure adherence to corporate ethics and compliance as a material issue of management, the JFE Group Sustainability Council, chaired by the president of JFE Holdings, supervises and provides guidance on compliance efforts, and important measures are reported to and deliberated by the Board of Directors for direction and supervision.

With regard to risk management, JFE Holdings as the holding company is responsible for the comprehensive risk management of the Group and has established a system under which its Board of Directors supervises risk management and confirms its effectiveness. JFE Holdings is continuously improving risk management for the entire Group based on discussions by its Board of Directors.

Objectives and results related to material issues of corporate management concerning governance

➤ **Material Issues of Corporate Management and KPIs** (P.20)

Key Initiatives

- **Introduction of non-financial metrics (related to employee safety and climate change) as indicators for performance-based remuneration for Directors** (P. 210)
- **Third-party analysis and evaluation of the Board of Directors' effectiveness** (P. 208)
- Disclosure of **skills matrix** for Directors and Audit & Supervisory Board Members (P. 207)
- **Corporate Ethics Awareness Survey** implemented periodically for officers and employees of JFE Holdings and operating companies (PP. 208 and 219)
- **Ongoing oversight and confirmation of the effectiveness of Group-wide risk assessment by the Board of Directors** (P.220)

Corporate Governance

Basic Policy

With the steel business, engineering business and trading business at its core, the JFE Group develops a broad range of businesses in a wide range of areas together with many group companies and partners. Establishing a proper governance system is essential toward improving independence and raising efficiency in each operating company, along with the optimal management of risks, which include those related to the environment, safety, and disaster prevention in the Group. It is also necessary for the sustainable growth of the Group and the medium- to long-term improvement of its corporate value.

We have also established the JFE Holdings, Inc. Basic Policy on Corporate Governance to express concretely the JFE Group's Corporate Vision of pursuing best practices in corporate governance and achieving further development in this area.

➤ JFE Holdings, Inc. Basic Policy on Corporate Governance (https://www.jfe-holdings.co.jp/en/company/info/pdf/basic-policy.pdf)
➤ Corporate Governance Report (https://www.jfe-holdings.co.jp/en/company/info/pdf/corporate-governance.pdf)

Results

Major topics discussed at the FY2022 Board of Directors Meeting included the following.

- Progress of the Seventh Medium-term Business Plan
- Large-scale capital expenditures (blast furnace blower electrification upgrade project for the Kurashiki district, No. 6 coke furnace Group A construction project for the Fukuyama district, etc.)
- ESG initiatives (e.g., efforts to achieve carbon neutrality, assessment and review of KPIs for material issues of corporate management)

Selected governance data can be accessed from the following link.

➤ Governance Data (P.249)

Systems and Initiatives

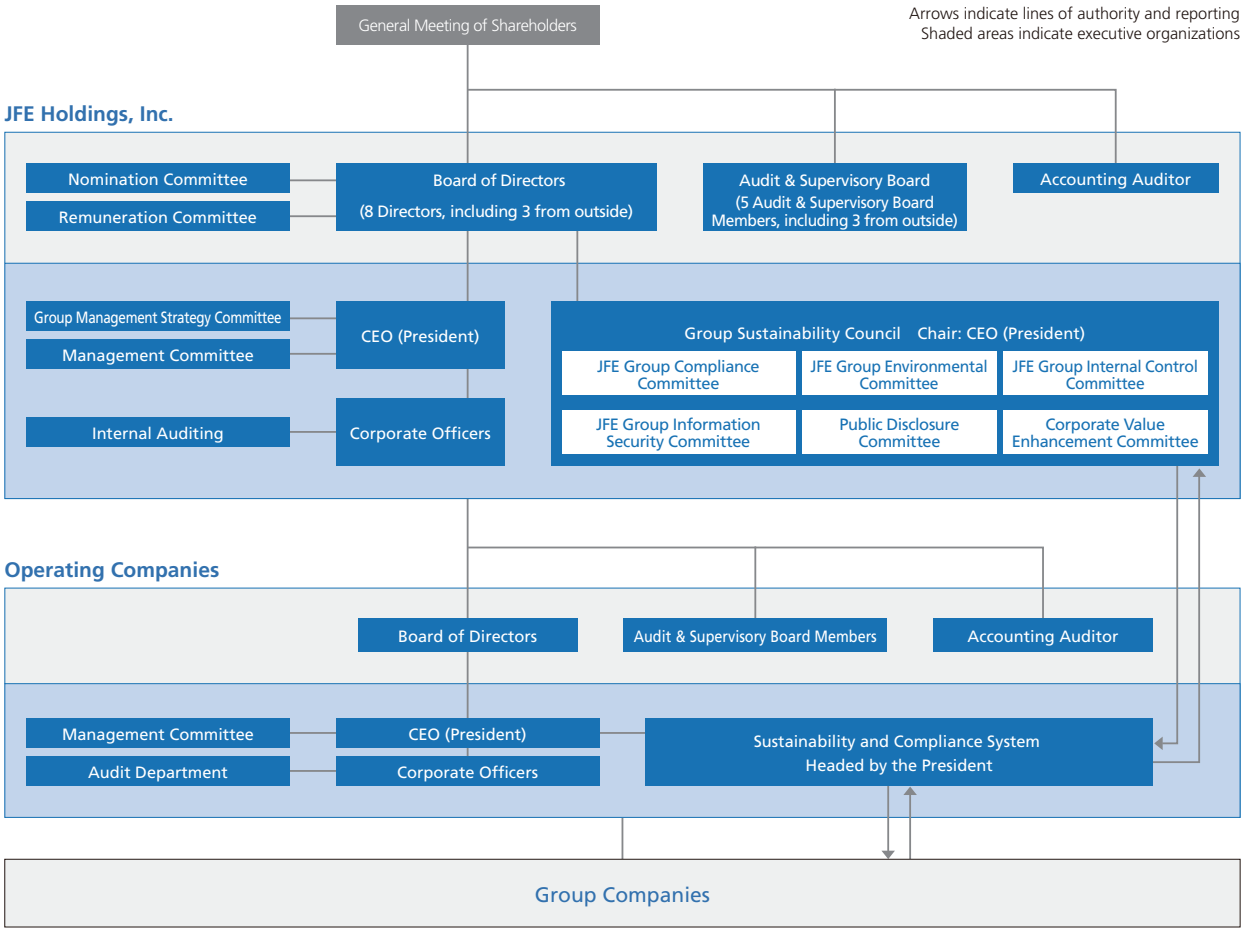
Corporate Governance System

Group Governance System

The JFE Group comprises a holding company and three operating companies, JFE Steel, JFE Engineering, and JFE Shoji.

JFE Holdings, a pure holding company at the core of the Group's integrated governance system, guides Group-wide strategy, risk management, and public accountability.

Each operating company has developed its own system suited to its respective industry, ensuring the best course of action for competitiveness and profitability.

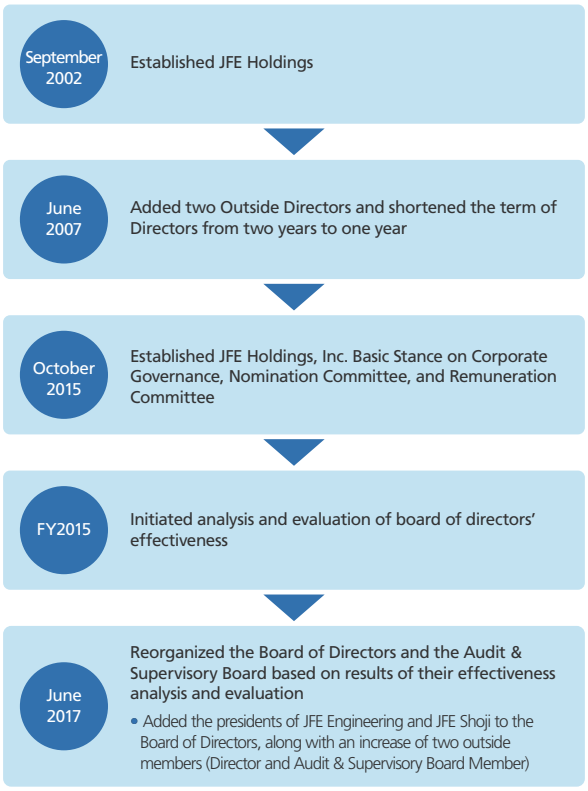


Governance Data (P.249)

Governance System

JFE Holdings and each operating company have their respective Audit & Supervisory Board Members. The companies are crosschecked by the Directors, who supervise operational execution, and the Audit & Supervisory Board members, who conduct audits. Also, a Corporate Officer system separates decision-making and execution to clarify authority and responsibility as well as to accelerate execution. JFE Holdings' Board of Directors is responsible for maintaining and enhancing management efficiency and passing resolutions as legally required, laying down key management policies and strategies and supervising operational execution. The Audit & Supervisory Board oversees management for the purpose of strengthening its soundness.

■ Major Initiatives to Strengthen the Governance System



Duties of the Board of Directors and other Bodies

Selection of Independent Outside Directors and Independent Outside Audit & Supervisory Board Members

Independent Outside Directors comprise at least one-third of the total number of Directors. Independent Outside Directors are elected from nominees who can be expected to bear responsibility for strengthening governance, including those with proven experience in managing a global enterprise or who possess expertise and deep knowledge and satisfy our independence standards. Currently, three of the eight Directors are Independent Outside Directors.

Meanwhile, more than half of the Audit & Supervisory Board Members are from outside. Independent Audit & Supervisor Board Members are elected from nominees who can be expected to enhance the auditing function, including those with proven experience in managing a global enterprise or who possess expertise and deep knowledge and satisfy our independence standards. Currently, of the five Audit & Supervisory Board Members, three are Independent Outside Audit & Supervisory Board Members.

➤ Standards for Independence of Outside Directors/Audit & Supervisory Board Members of JFE Holdings, Inc.
(https://www.jfe-holdings.co.jp/en/company/info/pdf/independence.pdf)
➤ Directors and Audit & Supervisory Board Members (P.250)

Approach to Diversity in the Board of Directors

With regard to the composition of the Board of Directors, the Company elects officers following deliberations by the Nomination Committee by focusing on the enhancement of diversity of the Board members, such as their expertise, knowledge and experience in various fields, while balancing with the appropriate size of the Board. One female Audit & Supervisory Board Member was appointed in June 2019, and one female Director was appointed in June 2020. The Company also elects Directors and Audit & Supervisory Board Members who possess a wealth of knowledge and experience as management in global enterprises. In this way, the Company is working to enhance gender and global diversity. The company will continue to systematically engage in initiatives to foster such human resources suitable for candidates for Directors and Audit & Supervisory Board Members by setting specific targets.

Skill Matrix of Directors and Audit & Supervisory Board Members

We have established the JFE Holdings, Inc. Basic Policy on Corporate Governance for promoting sustainable growth of JFE Holdings, Inc. and the JFE Group, the medium- to long-term improvement of corporate value, and expressing concretely the JFE Group's Corporate Vision of pursuing best practices in corporate governance and achieving further development in this area. With regard to the composition of the Board of Directors, we strive to enhance the diversity of the Board members, such as their expertise, knowledge, and experience in various fields, and identify necessary skills of corporate management in light of our business and corporate management issues. The Company elects officers following deliberations by the Nomination Committee while balancing with the appropriate size of the Board.

The skill matrix of each Director and Auditor against identified skills in light of their knowledge, experience, and expertise are summarized below.

	Corporate Management, Management Strategy	Sustainability, Environment	Technology, DX	Finance and Accounting	Internal Control, Governance	Legal Affairs, Compliance	Human Affairs, Labor, Human Resource Development	Sales, Marketing	Business that Requires Knowledge
Representative Director Koji Kakigi	●	●	●	●	●	●	●		Steel
Representative Director Yoshihisa Kitano	●	●	●		●				Steel
Representative Director Masashi Terahata	●	●		●	●	●	●		Steel, Trading
Director Hajime Oshita	●	●	●	●	●			●	Engineering
Director Toshinori Kobayashi	●	●	●		●			●	Steel, Trading
Outside Director Masami Yamamoto	●	●	●		●				—
Outside Director Nobumasa Kemori	●	●	●		●				—
Outside Director Yoshiko Ando		●			●	●	●		—
Audit & Supervisory Board Member Nobuya Hara	●			●	●				Steel
Audit & Supervisory Board Member Nakaba Akimoto					●	●			Steel, Engineering, Trading
Outside Audit & Supervisory Board Member Isao Saiki					●	●	●		—
Outside Audit & Supervisory Board Member Tsuyoshi Numagami	●			●	●			●	—
Outside Audit & Supervisory Board Member Takuya Shimamura	●	●			●			●	—

Nomination Committee and Remuneration Committee

JFE Holdings has maintained the Nomination Committee and the Remuneration Committee since October 2015 as advisory bodies to the Board of Directors to secure fairness, objectivity, and transparency in the appointment of and remuneration for Directors and Audit & Supervisory Board Members. For both committees, the majority of committee members are Outside Directors/Audit & Supervisory Board Members and the chairs are chosen from among these people.

The Nomination Committee deliberates and reports to the Board of Directors on matters pertaining to the basic policies related to the President of the Company, including election and dismissal, selection of candidates, and succession plans in addition to the nomination of candidates for Outside Directors and Outside Audit & Supervisory Board Members. (Three meetings were held in FY2022, all with 100% attendance.) The Remuneration Committee deliberates on matters pertaining to the basic policy on the remuneration of Directors, etc., of the Company and each operating company and reports to the Board of Directors. (Six meetings were held in FY2022, all with 100% attendance.)

➤ Nomination Committee and Remuneration Committee (P.251)

Support for Directors and Audit & Supervisory Board Members

Directors and Audit & Supervisory Board Members are provided with opportunities and funding to receive training in legal matters, corporate governance, risk management, and other subjects that help them fulfill their roles and duties.

In addition, a briefing is held for Outside Directors and Outside Audit & Supervisory Board Members prior to Board of Directors meetings.

Furthermore, Outside Directors and Outside Audit & Supervisory Board Members are provided with relevant information and opportunities to exchange opinions with the president and other top managers, attend key hearings on the operational status of individual departments, and inspect business sites and Group companies inside and outside Japan.

Analysis and Evaluation of the Effectiveness of the Board of Directors

Since FY2015, JFE Holdings has been evaluating the overall effectiveness of its Board of Directors based on its Basic Policy on Corporate Governance. Since FY2018, a third party has been conducting the analysis and evaluation to ensure objectivity. In FY2022, we revised part of our questionnaire before conducting the survey with all Directors and Audit & Supervisory Board Members.

Furthermore, we examined the results of our efforts in FY2022 to reflect the opinions and recommendations of the FY2021 evaluation.

Based on the discussions by the Board of Directors in light of the survey results and evaluation by the third-party organization, it was determined that the overall effectiveness of the Board has been ensured through vigorous discussions among members supported by sufficient preliminary briefings at the meeting for Outside Directors/Audit & Supervisory Board Members as well as by appropriate management and leadership by the chairperson.

The FY2022 initiatives reflecting the results of the effectiveness of evaluations up to FY2021 include the following.

- Apart from revising carbon neutrality initiatives and KPIs regarding material management issues, we encouraged discussion by the Board of Directors on sustainability and risk management by including a report on deliberations made at the JFE Group CSR Council (the current JFE Group Sustainability Council) to the Board, such as human rights due diligence, quality assurance, tax affairs, and compliance with the Antimonopoly Act. We continue to improve Group-wide risk management in accordance with discussions at the Board of Directors Meeting.
- We conducted a Corporate Ethics Awareness Survey with employees at the Company and operating companies to further instill awareness about corporate compliance. We are deepening our discussions on how to address issues extracted from the survey.
- We revised criteria for matters to be discussed at the Board of Directors Meeting to enhance discussions of the Board, further strengthen its supervisory function, and accelerate decision-making.
- In order to activate discussions at the Board of Directors Meeting, we held exclusive meetings for Outside Directors on a regular basis and provided more opportunities for them to exchange opinions free of influence from Inside Directors.

In addition to accurate and fair audits performed by the Audit & Supervisory Board Members, the members also express opinions and actively ask questions at Board of Directors meetings on management decisions and reports to further invigorate deliberations. Such outcomes supported the conclusion that JFE functions efficiently as a company with an Audit & Supervisory Board.

Furthermore, the following main issues were extracted from this survey for further improvement of effectiveness.

- Sustainable corporate growth depends upon revising KPIs on diversity and inclusion, human resource development, and providing challenging work environments while also deepening discussions on these matters to drive initiatives on human capital management and respect for human rights as well as other material management issues.
- From the perspective of risk management, matters concerning subsidiaries and affiliates must be comprehensively reported to the Board of Directors so it can realistically monitor potential risks across the Group.
- With a view to more thoroughly instill awareness about corporate compliance among employees and to thereby prevent risks from materializing, existing measures must be continually reviewed and improved.

In FY2023, we will continue to enhance the sharing of opinions between the Board of Directors and the executive members of operating companies. These efforts will include holding Board of Directors Meetings at domestic operating companies and field visits by the Board members to domestic and overseas operating companies.

Given these issues, we will proactively implement initiatives to increase the effectiveness of the Board of Directors and enhance the Group's corporate value.

Operating System

Key Decision-Making

JFE companies are responsible for business decisions in accordance with their respective rules and procedures, whereas JFE Holdings makes decisions about Group-wide matters. Each operating company determines key matters through a deliberative process by its own Management Committee and Board of Directors. In April 2017, JFE Holdings changed the operating structure of key committees. Management strategies involving the entire group are now deliberated by the Group Management Strategy Committee and core issues of JFE holdings, the operating companies and the Group are deliberated by the Management Committee before they are submitted to the Board of Directors for resolution.

➤ Operating System (P.251)

Executive Remuneration

Executive remuneration is based on the Basic Policy on Remuneration for Directors and Corporate Officers and the Policy for Deciding the Individual Remuneration for Directors and Corporate Officers founded on discussions and reports by the Remuneration Committee, and it is decided through either a resolution of the Board of Directors or deliberations by the Audit & Supervisory Board Members, for an amount within the total limit approved at the General Meeting of Shareholders.

Basic Policy on Remuneration for Directors and Corporate Officers

- The Board of Directors shall determine remuneration system for Directors and Corporate Officers based on deliberations regarding its appropriateness by the Remuneration Committee to ensure fairness, objectiveness, and transparency.
- The remuneration level for Directors and Corporate Officers shall be determined to secure excellent human resources who are able to put the Group's corporate vision into practice, taking into consideration the business environment of the Group and remuneration levels at other companies in the same industry or of the same scale.
- The ratio between basic remuneration and performance-linked remuneration (annual bonus and stock remuneration) shall be properly established according to the roles and responsibilities, etc., of each Director and Corporate Officer so as to function as sound incentives toward the sustainable growth of the Group.

Outline of Policy for Deciding the Individual Remuneration for Directors and Corporate Officers

- Remuneration for Directors and Corporate Officers shall be determined by a resolution of the Board of Directors in accordance with the Basic Policy and the Decision Policy, based on reports from the Remuneration Committee.
- Remuneration for the Directors and Corporate Officers is comprised of basic remuneration and performance-linked remuneration (annual bonus and stock remuneration).
- Basic remuneration is paid as a fixed amount, in cash, each month according to position.
- An annual bonus is linked to the Company's single-year performance (calculated based on financial and non-financial indicators) and is paid in cash once a year.
- Stock remuneration is granted as the Company's shares and cash equivalent to the amount of the Company's shares converted to market value through the trust upon retirement.
- The ratios of remuneration by type are structured so that the higher the position, the greater the weight of performance-linked remuneration, and the ratio for the company's President when performance target goals have been attained is set so that the ratio of basic remuneration, annual bonus and stock remuneration stands at 6:2:2.

The Company pays only basic remuneration to Outside Directors and Audit & Supervisory Board Members, given their roles of supervising and auditing management from an independent and objective standpoint. Directors who concurrently serve as Executive Directors of operating companies shall not be paid the Stock Remuneration from the Company.

Performance-linked remuneration is calculated as follows.

• Annual bonus

Annual bonuses are calculated by taking the total segment profit for a single fiscal year and indicators related to employee safety and climate change as the performance-linked indicators and multiplying the level of achievement of these indicators by a given coefficient for each position.

We introduced one non-financial indicator related to employee safety in FY2022 and one related to climate change in FY2023.

The employee safety indicator depends on the level of achievement of KPIs set for the operating company concerned, such as zero work fatalities and target lost-work injuries rate. The climate change indicator depends on the level of achievement of KPIs selected for the operating company concerned from "Contribute to resolving climate change issues (initiatives for achieving carbon neutrality by 2050)." (See the following diagram.)

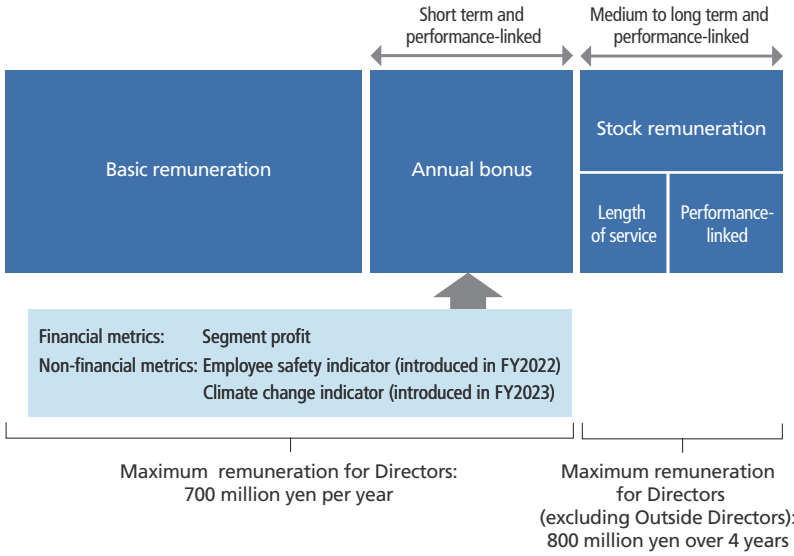
• Stock remuneration

Under the stock remuneration plan, a payment level is determined based on performance targets set in the Seventh Medium-term Business Plan of the Group. From FY2021 to FY2024, the payment level is determined according to the level of achievement of the target profit attributable to owners of the parent company of 220 billion yen per year, set under the Seventh Medium-term Business Plan. Furthermore, 5% or more return on equity attributable to owners of parent (ROE) is the minimal requirement for the payment.

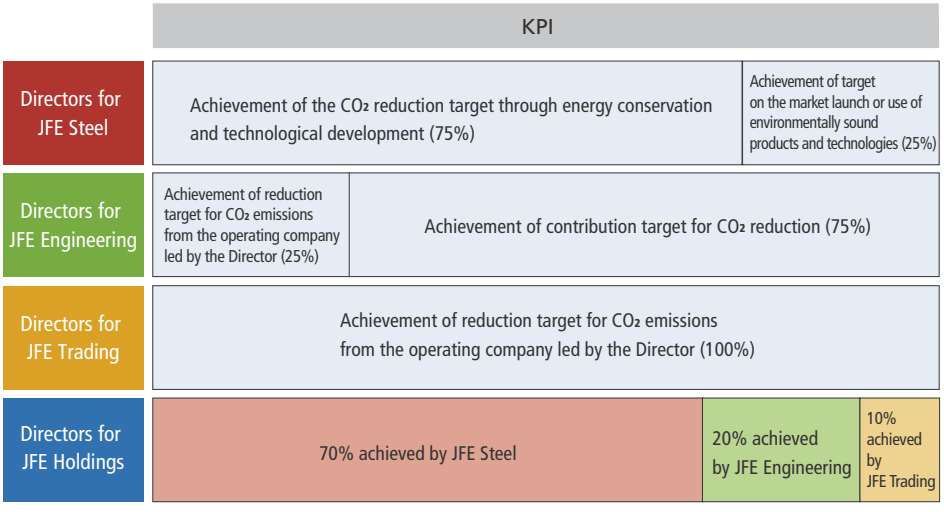
Directors who have been dismissed and Directors who have committed any misconduct may lose the right to receive benefits for Directors based on a resolution of the Board of Directors. Directors who have already received benefits may be asked to return the economic value equivalent to the Company's shares already received, based on a resolution of the Board of Directors if they engage in any misconduct.

To achieve sustainable corporate growth for the Group, the Remuneration Committee and the Board of Directors continue to improve the remuneration system for Directors to serve as an incentive with a higher level of integrity.

■ Design of the Remuneration Plan for Directors



■ Conversion Rates (Achievement of Climate Change Indicators)



*1 Excluding Outside Directors *2 Weighted-average level of achievement among operating companies

➤ Executive Remuneration (P.252)

Internal Control

The JFE Group's internal control system, in accordance with the Basic Policy for Building an Internal Control System, is maintained through various committee regulations including the Rules of the Board of Directors, Regulations for Group Management Strategy Committee, Regulations for Management Committee, Regulations for the JFE Group Sustainability Council, Regulations for Organization and Operations, Regulations for Document Management, Regulations for Addressing Violence Directed at Companies, and a Corporate Ethics Hotline. We revise and improve the Basic Policy from time to time to boost sustainable corporate value.

➤ Basic Policy for Building an Internal Control System (Japanese only)
(https://www.jfe-holdings.co.jp/company/info/pdf/naibutousei.pdf)

Strengthening Internal Control

Internal Audits

JFE Holdings, its major operating companies, and key Group companies have internal audit organizations comprising 172 people as of April 1, 2023. These organizations share information to enhance overall auditing within the Group. They also report internal audit findings to the Board of Directors as well as to the Audit & Supervisory Board to maintain the effectiveness of internal audits.

To ensure the proper implementation of sustainability activities, the JFE Group assesses environmental management, Antimonopoly Law compliance, measures taken to prevent the bribery of public officials, expense management, overseas office management, tax law compliance, safety management, and disaster prevention by systematically including these area in business operation audits conducted by the internal auditing department. If an audit finds an issue or problem, the internal audit departments of JFE Holdings and the operating company work together to share the information across the Group and incorporate lessons learned in sustainability activities conducted by the Group's companies.

Audits by Audit & Supervisory Board Members

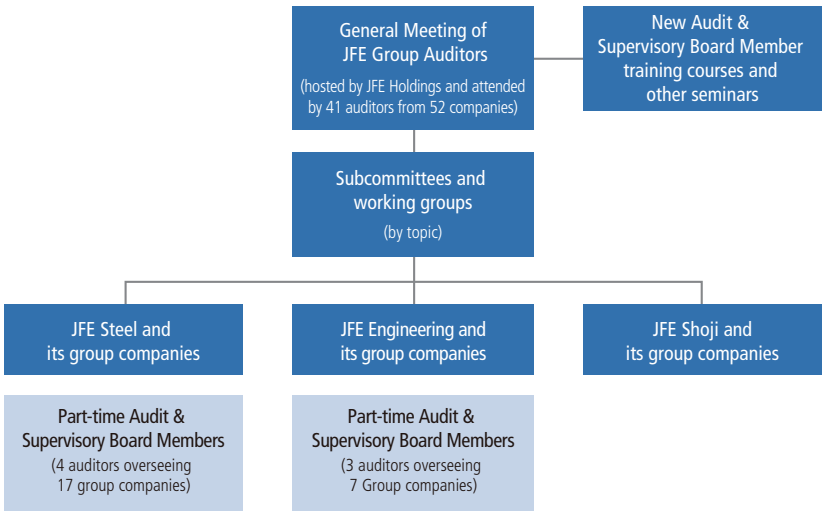
Audit & Supervisory Board Members attend the meetings of the Board of Directors, Group Sustainability Management Strategy Committee, Management Committee and Group Sustainability Council among other important meetings and express opinions as appropriate. To audit the execution of Directors responsibilities, they conduct hearings with Directors and Corporate Officers regarding operational status and receive operational reports from subsidiaries. In addition to undergoing statutory audits, JFE companies take the following initiatives to strengthen coordination among Audit & Supervisory Board Members by sharing information and ensuring the effectiveness of internal auditing by the Audit & Supervisory Board Members.

A total of 34 full-time Audit & Supervisory Board Members have been appointed to 29 companies, including JFE Holdings. Operating company personnel are dispatched to Group companies as part-time Outside Audit & Supervisory Board Members. Each dispatched Audit & Supervisory Board Member serves one to five subsidiaries to perform audit and enhance Group governance. Eight Audit & Supervisory Board Members served 25 companies in total.

The JFE Group Board of Auditors includes both full-time Audit & Supervisory Board Members of each Group company and part-time Audit & Supervisory Board Members. Subcommittees and working groups created to address specific issues meet autonomously to share information, investigate issues and enhance understanding. The findings of the year's activities are presented at the general meeting of JFE Group Auditors and used for audits.

➤ Operating System (P.251)

■ Structure of JFE Group Board of Auditors



Cooperation between Audit & Supervisory Board Members and Accounting Auditor

In FY2022, the Audit & Supervisory Board Members held nine scheduled or unscheduled meetings with Ernst & Young ShinNihon, JFE's outside accounting auditor, in which the latter presented its audit plan, completed work and detailed results. The firm also presented a detailed explanation of its quality management system to confirm its validity. In turn, the Audit & Supervisory Board Members explained their own audit plans and other matters to the firm. The two sides also shared opinions on related matters.

Cooperation between Audit & Supervisory Board Members and Internal Auditing Department

In FY2022, the Audit & Supervisory Board Members held eight scheduled or unscheduled meetings with the internal auditing department, in which the latter presented its internal audit plan, work status and detailed results. During the meetings, the Audit & Supervisory Board Members also shared opinions with the department.

Operating Company Governance

Some Directors, Corporate Officers, and Audit & Supervisory Board Members of JFE Holdings serve concurrently as the Directors or Audit & Supervisory Board Members of operating companies to strengthen governance and information sharing across the Group. To strengthen governance, JFE Holdings' managers attend each operating company's General Meeting of Shareholders and Management Planning Briefing, receive reports on their activities, and discuss the managerial policies of subsidiaries.

Policy on Listed Subsidiaries

To put into practice the Group's corporate vision of contributing to society with the world's most innovative technology, and also to realize sustainable growth and enhancement of medium- to long-term corporate value, the JFE Group forms a corporate group comprising companies with high expertise, divides business functions within the Group, and conducts businesses development outside of the Group. Of these subsidiaries, the following two are the listed companies that we hold.

GECOSS CORPORATION (Tokyo Stock Exchange, Prime Market)
The main business of GECOSS includes leasing and sales of temporary construction materials and designing and construction of temporary works. Its products and services are mainly provided to civil engineering and construction businesses. GECOSS offers products and services that match the needs of its customers in cooperation with JFE Steel and the Group companies. We believe that carrying out business with GECOSS as our subsidiary will lead to maximizing the value of the company and of the Group through personnel exchanges, R&D, and other collaborative initiatives with JFE Steel. Furthermore, GECOSS maintains its listed status as a means to enhance its competitiveness from the perspective to secure market recognition and credibility in funding, sales and marketing, and hiring.

JFE Systems, Inc. (Tokyo Stock Exchange, Standard Market)
The main business of JFE Systems includes system integration consisting of planning, designing, development, operation, and maintenance of information system, system construction utilizing solutions, and the company's own products, and IT infrastructure solutions that support the business system. Computer systems are an important foundation in the steel business that support overall business activities, including order acceptance, production, shipment, and quality management, and in using a variety of data. Guaranteeing the accumulation of know-how and the continuation of personnel exchanges by holding JFE Systems as a subsidiary will also be indispensable for maintaining the competitiveness of JFE Steel in pressing ahead with digital transformation. Furthermore, JFE Systems maintains its listed status as a means to enhance its competitiveness from the perspective to secure market recognition and credibility in funding, sales and marketing, and hiring.

The aforementioned companies are subject to rules different from those applicable to other consolidated subsidiaries based on the guidelines of the Ministry of Economy, Trade and Industry and the Tokyo Stock Exchange regarding listed subsidiaries, and other measures are also taken so as to ensure that each of the companies conducts autonomous corporate activities exercising autonomy and flexibility, secure management independence as listed companies, and make sure that the interest of the said subsidiary's shareholders other than the said subsidiary and the Company will not be unfairly impaired. In addition, with respect to matters necessary for the Group's risk management, prior consultation and reporting are required from each company while securing their independent decision-making, so as to implement risk management as a member of the Group companies.

JFE Container was delisted from the Standard Market of the Tokyo Stock Exchange on July 28, 2022 and became a wholly owned subsidiary of JFE Steel Corporation through a share exchange on August 1, 2022. JFE Container is mainly engaged in the manufacture and sale of steel drums and high-pressure gas containers. By making JFE Container a wholly owned subsidiary, the Company expects the development of new fields through further group collaboration such as in the high-pressure gas container business and the expansion of opportunities for business creation, toward the realization of a decarbonized and hydrogen society. This will also enable business management and prompt decision-making from a medium- to long-term perspective. Accordingly, the Company has come to the conclusion that making JFE Container a wholly owned subsidiary will contribute to enhancing the corporate value of the JFE Group as a whole.
Furthermore, we shall regularly verify the significance of maintaining the listing of the listed subsidiaries and take necessary measures upon confirmation at its Board of Directors. The above details were verified and discussed at a Board of Directors meeting held in May 2023.

Basic Policies for Strategic Shareholdings and Exercise of Related Voting Rights

All shares held by the Company are the shares of subsidiaries or affiliates. In principle, the Company's wholly owned subsidiaries and operating companies, JFE Steel Corporation, JFE Engineering Corporation and JFE Shoji Corporation (hereinafter "Operating Companies"), do not hold domestic listed stocks as strategic shareholdings. Strategic shareholdings, however, are allowed as an exception when holding the stocks of the Company is determined to be necessary for maintaining and achieving growth for the Group.

The Board of Directors regularly confirms the relative value of the strategic shareholdings and whether the benefits and risks of such holdings are commensurate with their capital cost, and sell shareholdings that are not significant or if there is a risk of damage to shareholder interests. In FY2022, the Company sold all or part of 30 stocks for 27.1 billion yen (market value). Furthermore, the Board of Directors, at a meeting in September 2022, examined the significance of strategic holdings and the return on investment.

The exercise of voting rights of strategic shareholdings is decided upon reviews by operating companies on the content of the proposal and is appropriately implemented in a way that will maximize shareholder interest. To be specific, the content of the proposal is to be checked by the investment application department and the investment control department, and approval will be given to proposals which are considered not to pose any threat to the maximization of interest of these operating companies as shareholders.

Of the shares for investment purposes held by JFE Steel, which has the largest balance sheet amount for investment purposes posted in the consolidated financial statements of the company, those shares of the company held for purposes other than pure investments are shown below.

■ Number of Issues and Amount Reported in the Balance Sheet

	FY2019 year-end	FY2020 year-end	FY2021 year-end	FY2022 year-end
Number of issues	219	171	146	138
Total balance sheet amount (billion yen)	166.1	96.0	71.2	59.0

Compliance

Basic Policy

In expanding our businesses in Japan and abroad, it is important that JFE maintains relationships of trust with all stakeholders, including its customers, shareholders and local communities. Trust can only be built upon a strong foundation of ensuring thorough compliance. Misconduct and scandals resulting from compliance violations can instantly shatter the trust that has taken many years to establish. Therefore, JFE believes it is extremely important that all members of the organization deepen their knowledge and awareness of compliance and perform their jobs accordingly. It conducts training on various topics such as the Antimonopoly Act, the Subcontract Act and anti-corruption, including prevention of bribery of public officials, using e-learning and compliance guidebooks and through guidebook reading sessions as well as by other means.

Systems

Compliance System

The Compliance Committee chaired by the President of JFE Holdings generally convenes every quarter to deliberate basic policies and issues and then supervise their implementation. Each operating company has a similar in-house system for promoting and supervising compliance. In addition, the JFE Group has introduced a Corporate Ethics Hotline to ensure that crucial information regarding compliance can be communicated directly from the front lines to top management.

For more on the JFE Group Standards of Business Conduct, please refer to the following information.

➤ JFE Group Standards of Business Conduct (https://www.jfe-holdings.co.jp/en/company/philosophy/guideline.html)

Targets and Results

The JFE Group Standards of Business Conduct guide employees to conduct their business activities based on the Corporate Vision and Corporate Values. They also help to strengthen awareness among all JFE Group executives and employees and ensure adherence to corporate ethics. We promote the initiatives by upholding the Ensure Adherence to Corporate Ethical Standards and Compliance as material issues of corporate management and setting KPIs to achieve those targets.

➤ Performance Evaluation for FY2022 KPIs and Establishment of FY2023 KPIs (P.20)

Initiatives

Ensure Adherence to Corporate Ethical Standards and Compliance

Compliance Education

The JFE Group's Compliance Guidebook, created as part of our effort to foster corporate compliance culture across the Group, is distributed to all Directors and employees inside and outside Japan for individual and group review. In addition to information about laws and ordinances relevant to our business activities, it provides guidance on which actions comply with internal rules and which do not (such as cartels, collusive bidding, the bribing of public officials, insider trading, harassment, and other acts in violation of laws related to the environment, labor standards, and occupational health and safety). The guidebook also provides a simple explanation of concrete standards for complying with laws and internal rules and for acting in accordance with social mores with over a hundred case studies.

Questions that come up in the course of daily operations as well as situations and cases that test our judgment have been compiled in the guidebook with explanations by the relevant department. The content has been reviewed by legal counsel. The guidebook has been reviewed according to the revisions of relevant laws and rules, and some of the cases described have been added, revised, or omitted since the first edition in 2006 to improve its overall content.

The JFE Group also conducts training on compliance with the Antimonopoly Act, insider trading restrictions, security export controls, the Construction Business Act, anti-corruption laws including laws against bribery of public officials, and more.

Whistleblowing System

The JFE Group has established a Corporate Ethics Hotline, a contact point accessible to all officers and employees (including contract workers, part-time workers, and temporary staff, either active or retired) of the JFE Group as well as those of suppliers and other business partners. The purpose of the hotline is to ensure adherence to corporate ethics and compliance and to prevent corruption and human rights abuses. Reports and consultations are accepted via e-mail, a dedicated phone line and postal mail, anonymously if preferred, and an external hotline to an independent law firm is also provided.

To encourage the active sharing of information, the Corporate Ethics Hotline is operated under rules and regulations that ensure strict confidentiality and protect people who report information or seek advice against acts of retaliation. We investigate the facts of any incident that has been reported on and consulted about only after consulting with the whistleblower to protect their privacy, and feedback the investigation results to the whistleblower if requested.

We strive to prevent incidents of misconduct and ensure the early detection and correction of wrongdoing by accepting consultations and reports, ranging from compliance issues such as violation of the Antimonopoly Act, corruption, and bribery, to human rights abuses including misconduct and harassment in the workplace. In the event that violations of laws are confirmed, corrective and remedial measures are taken in the organization involved. Details of the reports and consultation received at the Corporate Ethics Hotline are regularly communicated to full-time Audit & Supervisory Board Members while the operational status of the system is reported to the Board of Directors for their supervision.

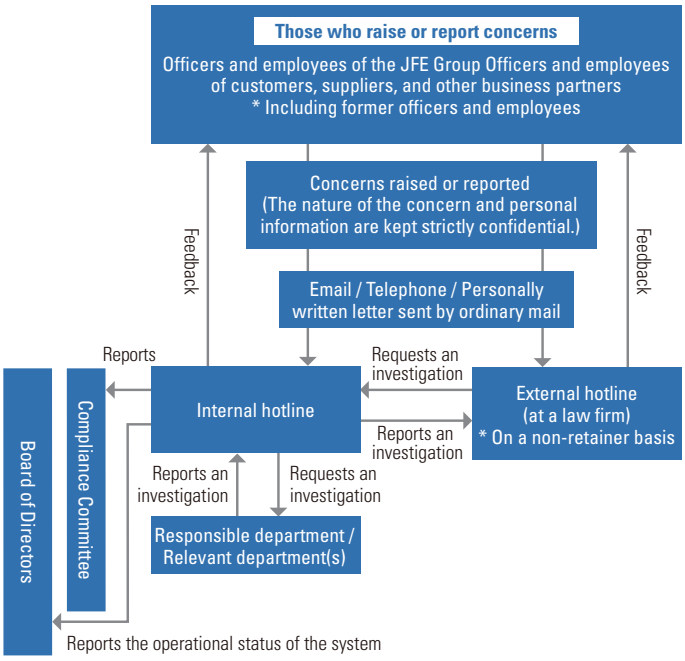
We also accept inquiries, anonymously if preferred, on compliance and other issues from all types of stakeholders via a form that is always available on the corporate website. The content is handled as confidential and appropriately addressed.

Procedures for handling illegal acts or other violations:

- Departments responsible for compliance at JFE Holdings and each operating company carry out necessary responses, such as implementing the initial response, confirming facts, investigating the cause, and developing measures to prevent recurrence.
- Departments responsible for compliance at each company report on the facts, cause, and recurrence prevention measures to the Compliance Committee at each company to confirm the cause and assess the effectiveness of recurrence prevention measures and the responsibility of related parties.

- Matters such as major violations are reported to the Compliance Committee to be shared across the entire Group and to facilitate horizontal implementation of recurrence prevention measures to make sure that no similar violations occur anywhere in the Group.

■ **Whistleblowing System**



Preventing Corruption and Bribery

Under its Standards of Business Conduct, the JFE Group endeavors to comply with laws and ordinances, compete fairly and freely, refrain from illegal business activities, and build and maintain sound and proper relationships with governments and political authorities.

We explicitly prohibit bribery, such as the offering and receiving of illegal payoffs, excessive entertaining or favors, as well as corruption such as embezzlement from a position of advantage and promotion of conflicting interests. The Group strives to thoroughly prevent corruption by stating in its Company rules that these offenses will be penalized.

In addition, under its Standards of Business Conduct, the JFE Group endeavors to build and maintain sound and proper relationships with governments and political authorities. The bribing of public officials has become a major business risk in recent years due to growing global awareness of corruption and a stronger drive by authorities to expose such wrongdoing. The JFE Group does not tolerate any kind of illegal activity in Japan or any other country, including bribery, such as offering money or other benefits to public officials, and never resorts to these illegal activities to gain profit or resolve problems. Considering this, the Group issued JFE Group's Basic Policy on Preventing Bribery of Public Officials and disseminate it throughout the Group including operating companies. The JFE Group also maintains various systems to prevent the bribery of public officials, such as by stipulating that efforts be made to use third-party appointment checklists or have an anti-bribery confirmation letter signed when using external parties including agents or consultants who may have connections with overseas public officials.

For more on our stance on preventing bribery, refer to the following information.

➤ **JFE Group's Basic Policy on Preventing Bribery of Public Officials**
(https://www.jfe-holdings.co.jp/en/company/philosophy/anti-bribery.html)

Resisting Organized Crime

The JFE Group declares in its standards of business conduct that it will firmly resist all antisocial forces and has established the JFE Group Policies for Addressing Antisocial Forces and Regulations for Addressing Violence Directed at Companies to clarify the measures to be taken against antisocial forces, including an initial response manual.

The JFE Group Policies for Addressing Antisocial Forces has been approved by the Board of Directors, and we will seek to establish sound corporate management based on an organized and unified response to the issue within the framework of our system of compliance. We have specifically set up a section responsible for handling antisocial forces in the General Administration and Legal Affairs departments of each Group company to completely discontinue any dealings with antisocial forces. We will also set up rules for reporting and responding to any related incidents and will resolutely stand against antisocial forces by cooperating with law enforcement.

In addition, we will seek to establish thorough awareness of the JFE Group Policies for Addressing Antisocial Forces and specific rules governing our response among all executives and employees by providing e-learning and distributing the Compliance Guide Book.

Compliance with the Antimonopoly Act

The JFE Group views past violations of the Antimonopoly Act seriously and continues to implement thorough measures to eliminate the possibility of future infringements. The internal audit departments of JFE Steel and JFE Engineering are auditing transactions with other companies to ensure compliance with the Antimonopoly Act by confirming that no activities are suspected of violating the law. The audits are being conducted regularly at each office, including branches and branch offices. Each Group company is implementing similar measures to prevent violations of the Antimonopoly Act.

We are increasing the effectiveness of these recurrence prevention measures by regularly reporting relevant activities to the Compliance Committee.

Confirmation and Improvement through the Employee Awareness Survey

The JFE Group regularly conducts a Corporate Ethics Awareness Survey (currently once every three years, and once every two years starting in FY2024) for Directors and employees of the Company as well as the operating companies to confirm the penetration of and thorough compliance with the Group's Corporate Vision, Corporate Values, and Standards of Business Conduct, along with the identification of potential risks. The survey conducted in FY2022 confirmed that many employees acknowledged the vision and corporate policy and are aware of compliance in the course of their work. On the other hand, the survey also brought our attention to issues to address going forward. Issues identified are reflected in the specific initiatives of each company for improvement under the supervision of the JFE Group Sustainability Council and the Board of Directors.

Indictment of JFE Group Company Employees

Employees of JFE Engineering Corporation were indicted in March 2022 for alleged involvement in obstructing bids concerning the construction contracted with Taketomi Town, Okinawa Prefecture. One of them, now a former employee of the company, was convicted by the Naha District Court in August 2022.

We deeply regret this situation and sincerely apologize for the inconvenience and concern caused to many of the related parties.

We regard this matter very seriously and sincerely. We will seek to determine the cause of this incident, implement measures to prevent any recurrence, and strive to regain public trust as early as possible while continuing to closely monitor the progress of court cases involving the other employees of the company involved.

Risk Management

Basic Policy

In order to enable the Group to achieve sustainable growth with ever-increasing corporate value through the pursuit of the JFE Group's vision of "contributing to society with the world's most innovative technology," we have properly identified risks across the Group. Our risk management system is subject to ongoing improvement, and effective measures are taken to eliminate as many foreseeable risks as possible.

Systems

Risk Management System

JFE Holdings is responsible for comprehensive risk management of the Group in accordance with its Basic Stance for Building an Internal Control System by establishing a system whereby the Board of Directors oversees risk management and confirms its effectiveness.

Specifically, corporate officers are responsible for recognizing risks, and those deemed material are then confirmed and assessed by the JFE Group Sustainability Council, chaired by the CEO (president) of JFE Holdings. Next, the CSR Council deliberates and decides on countermeasure policy and action plans for risk management. Such risks include business activities; compliance-related matters such as compliance with the Antimonopoly Act and laws related to anti-corruption including bribery of public officials, observance of company policy and regulations such as the Corporate Vision and JFE Group Standards of Business Conduct; and ESG risks such as those related to the environment, climate change, human affairs, labor, safety and disaster prevention; human rights abuses such as sexual harassment and power harassment, quality management, financial reporting, and information security.

The Board of Directors oversees risk management and confirms its effectiveness by regularly receiving reports on Group policy and action plans on risk management, and through deliberation and decision-making on important matters regarding risk management.

We will continue improving Group-wide risk management in accordance with the discussion by the Board of Directors.

For our risk management policies and systems, refer to the following information.

➤ Basic Policy for Building Internal Control Systems (Japanese only)
(https://www.jfe-holdings.co.jp/company/info/pdf/naibutousei.pdf)
➤ JFE Group Sustainability System (P.24)
➤ Development of the Whistleblowing System (P.217)

Initiatives

Response to Specific Risks

Response to Climate Change Risks

The JFE Group places initiatives on climate change as top-priority business concerns, and it formulated the JFE Group Environmental Vision for 2050 to achieve carbon neutrality by 2050. In the Seventh Medium-term Business Plan, the Group established managerial targets to reduce CO2 emissions from the steel business by 18% from FY2013 levels by the end of FY2024 and by over 30% from FY2013 levels by the end of FY2030, and further achieve carbon neutrality by 2050 in multiple ways.

Risks are identified and evaluated based on a scenario analysis conducted under the framework recommended by the TCFD, and important factors that may affect management are selected for further analysis and used in formulating business strategies, including the Seventh Medium-term Business Plan.

For climate change risks and opportunities, refer to the following information.

➤ TCFD Recommended Scenario Analysis (P.91)

Intellectual Property Management

The JFE Group meticulously manages intellectual property across its diverse business activities. To prevent infringement on third-party intellectual property, it constantly monitors the latest information on intellectual property and implements all necessary measures.

Privacy Protection

JFE has established the JFE Group Privacy Statement for managing information including "My Numbers," which are personally identifiable numbers under Japan's social security and tax number systems.

To maintain the appropriate protection of personal information, employee trainings on the rules, which have been set in place in accordance with the privacy statement, have been conducted as stipulated in applicable laws of each country related to businesses and guidelines.

To reduce information security risks, including cyber-attacks and improper system use such as leaks of personal information, and to promote safe business activities, the JFE-Security Integration and Response Team (JFE-SIRT), comprising the IT division managers of each operating company, participates in the Nippon CSIRT Association, established by private sector volunteers and corporate Computer Security Incident Response Teams (CSIRTs) active in Japan. We seek to enhance the level of our initiatives by exchanging information and coordinating on security incidents.

For privacy protection policies, please refer to the following information.

➤ JFE Group Privacy Statement (https://www.jfe-holdings.co.jp/en/privacy.html)

Information Security

The JFE Group formulates various rules on information security management to prevent information leakage and system failures due to cyber-attacks and improper system use. Efforts are made to enhance information-security knowledge and awareness of rules among employees through training and education. Additionally, shared IT measures are applied in each Group company and regular information security audits are conducted to reinforce the overall information security management level in the Group.

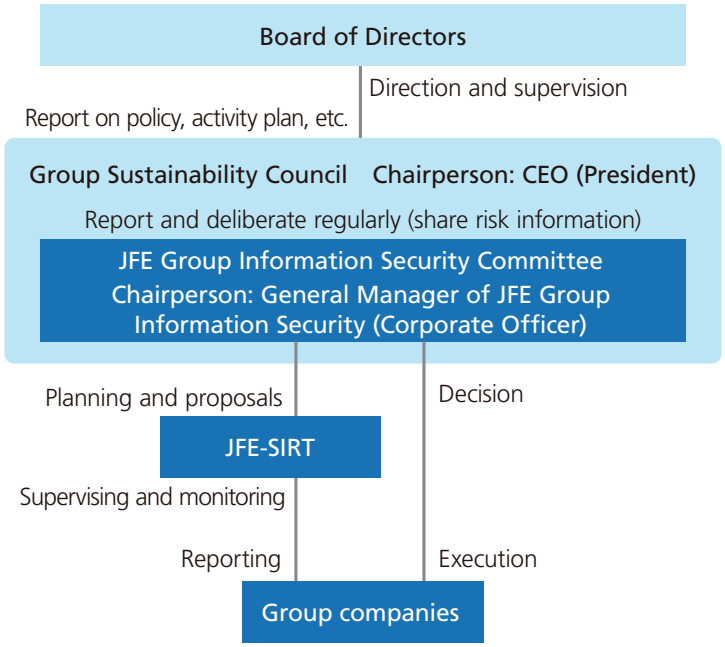
Key issues related to IT, particularly information security, are deliberated by the JFE Group Information Security Committee to determine Group policy.

Applying the policies set by the committee, the JFE-SIRT formulates and implements information-security measures, performs information security audits, offers guidance on responding to incidents and generally enhances the level of Group-wide information security management. The JFE-SIRT reports on its activities to the Group CSR Council as appropriate.

For more details on JFE's information security, refer to the information in the management section of the DX REPORT.

➤ DX REPORT (https://www.jfe-holdings.co.jp/en/investor/library/dxreport/index.html)

■ **Conceptual Diagram of Information Security**



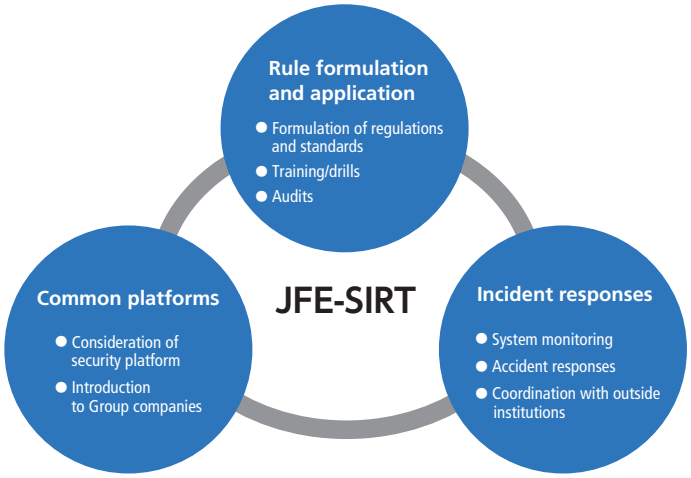
Cybersecurity

The JFE Group Declaration of Cybersecurity Management was revised in January 2023. Even as we consider cybersecurity as a vital investment for our digital transformation, we understand its continual enhancement is also a material management concern given the increasing frequency and sophistication of cyber threats. Cybersecurity measures are being accelerated under management leadership, mainly through the JFE-SIRT.

For more details about our cybersecurity measures, please see Security Management in the DX REPORT.

➤ DX REPORT (https://www.jfe-holdings.co.jp/investor/library/dxreport/index.html)

■ **Cybersecurity monitoring initiatives**



Responding to Human Rights Risks within the Supply Chain

The JFE Group procures raw materials, construction materials, and machinery from all over the world. In response to human rights risks associated with the supply chain, the Group established the JFE Group Human Rights Basic Policy in 2018 to take action in accordance with the United Nations Guiding Principles on Business and Human Rights. Each operating company has established raw material purchasing policies, purchasing and procurement policies, and a basic policy on sustainability in the supply chain, and they carry out purchasing in a way that respects human rights, legal compliance, and environmental preservation.

In addition, the Group has been conducting human rights due diligence since FY2021. In April 2023, we revised the JFE Group Human Rights Basic Policy to take account of recent changes in public awareness and issues surrounding human rights. All supply chain members and other stakeholders will continue to be called upon Group-wide to respect and support human rights.

For more details on our human rights due diligence initiatives, refer to Human Rights.
Human Rights (P.183)

JFE Group's Business Continuity Plan

Anticipating the possibility of natural disasters caused by typhoons and major earthquakes as well as a rapid expansion of infectious diseases such as a new strain of influenza, the JFE Group has formulated a business continuity plan (BCP) to address contingencies. We conduct regular training based on the BCP while also pursuing other countermeasures.

In the event of a major earthquake, the Group Sustainability Council will promptly discuss and determine the policy on how to deal with the matter, based on predetermined response processes to minimize loss and other damages.

Response to Major Natural Disasters

We are preparing to respond in the event of a major earthquake through measures such as establishing tsunami shelters, maintaining a Company-wide line of command under restricted communications and power outages, and securing data backup. We have also strengthened the drainage system at our steelworks to address the impact of typhoons and torrential rains that are occurring with increasing severity in Japan.

Response to Infectious Diseases

Apart from the development of policies against novel influenza virus infections, we have been taking simulation-proven measures for varying scenarios to maintain key operations and prevent stoppages, including those at steel production sites and steelworks, even if there is an increase in the absence rate due to the spread of a disease. The policies are periodically reviewed and improved by the JFE Group Sustainability Council and other relevant bodies. Moreover, as a measure to protect employees against the threat of infectious diseases, we provide vaccinations and health checkups for employees, as well as their families, who are assigned to countries outside Japan and for those who go abroad for work. In addition to safety information in the destination countries, we also provide information about local infectious diseases and prohibit employees from going abroad to protect their safety, depending on prevailing circumstances.

Tax Transparency

Basic Policy

The JFE Group upholds the JFE Standards of Business Conduct and complies with both the letter and spirit of the tax laws of each country as well as international rules, including the taxation guidelines issued by the Organization for Economic Co-operation and Development and other international institutions. We will pay taxes in every country where we do business in a timely, appropriate, and fair manner.

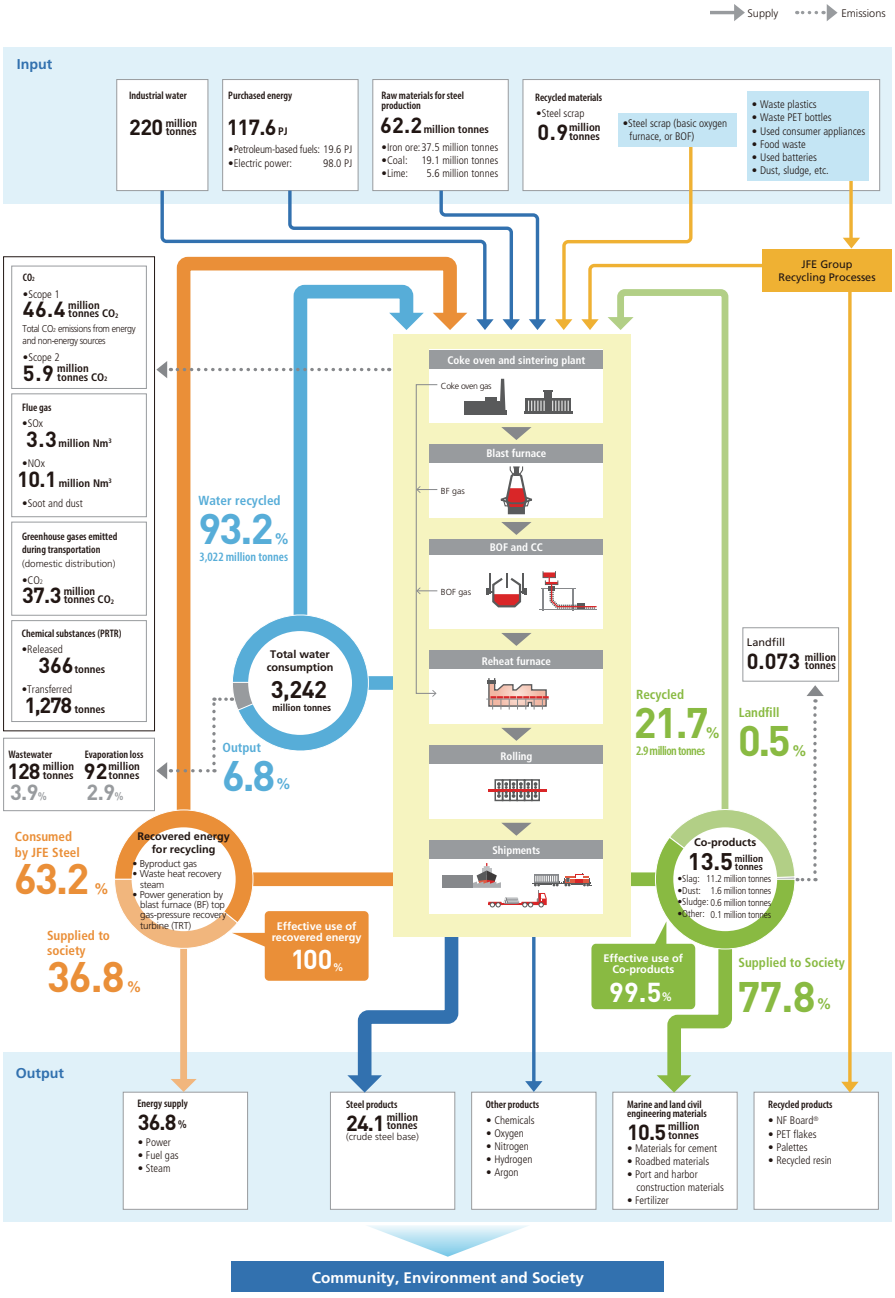
Moreover, we seek to forge relationships of trust with the tax authorities in each country by raising transparency and without resorting to tax planning or the use of tax havens to evade taxation.

Environmental Data

Material Flow

JFE Steel works to reduce the environmental impact of its iron and steelmaking processes, including through the effective use of resources. The company recycles 93.2% of the water it uses for production and uses 99.5% of its co-products, such as iron and steelmaking slag. In addition, 100% of co-product gas generated during production is reused as fuel for reheating slabs, generating power for internal use and supplying power to the public.

JFE Steel



JFE Engineering (Head Office and Works)

Input

Steel	**27,900** tonnes
Energy	
• Electric power purchased	**24.5** GWh
• Class A heavy oil	**137** kl
• Kerosene	**4.0** kl
• Light oil	**291** kl
• Gasoline	**14.4** kl
• City gas	**305,000** Nm^3
• LPG	**89.2** tonnes
Water	**64,500** tonnes

JFE Engineering

- **Tsurumi Works**
- **Tsu Works**

Output and Emissions

Products	**27,000** tonnes
CO_2	**6,600** tonnes CO_2
• Scope 1	**2,800** tonnes CO_2
• Scope 2	**3,800** tonnes CO_2
Waste discharged	**1,081** tonnes
• Industrial wastes	**821** tonnes
• General wastes	**259** tonnes
Wastewater (ocean only)	**122,000** tonnes
Others (PRTR)	**128** tonnes

Abbreviations indicated under "scope" represent the following group or company:
JFE Group [All]; JFE Steel Group [ST Gr]; JFE Steel [ST]; JFE Engineering Group [EN Gr]; JFE Engineering [EN]; JFE Shoji Group [SH Gr]; JFE Shoji [SH]

Environmental Management

■ Data Regarding Environmental Management

Items		Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
% covered by ISO 14001 certification	Base	All	%	54	58	58	54	52
		ST Gr	%	20	21	21	18	44
		EN Gr	%	5	9	9	8	44
		SH Gr	%	29	28	28	27	64
	Employee	All	%	72	74	70	68	67
		ST Gr	%	72	75	74	72	70
		EN Gr	%	60	60	51	50	50
		SH Gr	%	88	92	89	83	81
Environmental audit (number of sites)		ST Gr	sites	31	32	24	29	28
		EN Gr	sites	50	48	28	52	50
Environmental education conducted (total participants)		EN Gr	people	1,059	1,063	731	1,131	889

■ Environmental Accounting Data (1)

Breakdown of environmental protection cost		FY2021		FY2022	
		Investment (billion yen)	Cost (billion yen)	Investment (billion yen)	Cost (billion yen)
Management	Impact monitoring and measurement, and EMS expenses and education	14	25	14	27
Global warming countermeasures	Saving and efficiently using energy	189	270	55	359
	Recycling industrial water	66	174	32	216
Conservation of natural resources	Recycling and waste management of internally generated materials, etc.	12.0	59	14	62
Environmental protection	Air pollution countermeasures	124	314	159	312
	Water pollution countermeasures	72	96	43	107
	Prevention of soil contamination, noise, vibration, and subsidence	0	5	0	5
Other	Charges, etc.	—	14	—	14
R&D	Technologies for protecting the environment, saving energy, and preventing global warming	8	93	10	105
Societal activities	Support for nature preservation and forestation, information disclosure, exhibitions, and public relations	—	6	—	7
Total		485	1,056	327	1,215

Note: Data cover all investment activities of JFE Steel Corporation and R&D activities of JFE Engineering Corporation.

■ Environmental Accounting Data (2)

Items	Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Energy-saving investment (accumulated)	All	billion yen	505.4	532.1	546.5	565.4	570.8
Environmental protection investment (accumulated)	All	billion yen	708.5	727.6	742.1	770.9	797.1

Climate Change

■ CO_2 Emissions by Scope

Items	Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Scopes 1 and 2 total*1*2	All	million t-CO_2	59.9	60.4	53.1	59.0	56.1
	ST Gr	million t-CO_2	59.7	60.0	52.6	58.6	55.7
	ST	million t-CO_2	55.4	56.0	49.1	54.7	52.3
	ST subsidiaries	million t-CO_2	4.3	3.9	3.5	3.9	3.4
	EN Gr	million t-CO_2	0.212	0.403	0.484	0.387	0.422
	EN	million t-CO_2	0.0175	0.0168	0.0141	0.0103	0.0081
	EN subsidiaries	million t-CO_2	0.195	0.386	0.470	0.377	0.414
	SH Gr	million t-CO_2	0.0362	0.0353	0.0296	0.0319	0.0316
	SH	million t-CO_2	0.0005	0.0005	0.0004	0.0004	0.0004
	SH subsidiaries	million t-CO_2	0.0358	0.0348	0.0292	0.0315	0.0311
Scope1*3*4	All	million t-CO_2	52.3	52.9	46.6	51.9	49.0
	ST Gr	million t-CO_2	52.1	52.5	46.2	51.5	48.6
	ST	million t-CO_2	49.2	49.8	43.8	48.8	46.4
	ST subsidiaries	million t-CO_2	3.0	2.7	2.4	2.7	2.2
	EN Gr	million t-CO_2	0.171	0.361	0.442	0.345	0.395
	EN	million t-CO_2	0.0078	0.0038	0.0024	0.0024	0.0029
	EN subsidiaries	million t-CO_2	0.163	0.357	0.439	0.343	0.393

Items	Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Scope2*5	All	million t-CO_2	7.6	7.6	6.4	7.1	7.1
	ST Gr	million t-CO_2	7.5	7.5	6.4	7.0	7.0
	ST	million t-CO_2	6.2	6.3	5.3	5.8	5.9
	ST subsidiaries	million t-CO_2	1.3	1.2	1.1	1.2	1.1
	EN Gr	million t-CO_2	0.0416	0.0422	0.0424	0.0418	0.0263
	EN	million t-CO_2	0.0097	0.0129	0.0116	0.0079	0.0052
	EN subsidiaries	million t-CO_2	0.0319	0.0293	0.0308	0.0339	0.0211
	SH Gr	million t-CO_2	0.0362	0.0353	0.0296	0.0319	0.0316
	SH	million t-CO_2	0.0005	0.0005	0.0004	0.0004	0.0004
	SH subsidiaries	million t-CO_2	0.0358	0.0348	0.0292	0.0315	0.0311
Unit CO_2 emissions (numerator: Scopes 1 and 2 total; denominator: sales)	All	t-CO_2/ billion yen	1,546	1,619	1,644	1,352	1,057
Scope3*6*7	All	thousand t-CO_2e	16,751	16,382	14,369	20,778	23,184
Category 1 Purchased goods and services	All	thousand t-CO_2e	13,371	12,557	11,026	17,244	19,750
Category 2 Capital goods	All	thousand t-CO_2e	1,180	1,401	1,226	1,221	1,166
Category 3 Fuel and energy related activities not included in Scopes 1 or 2	All	thousand t-CO_2e	370	728	671	717	736
Category 4 Upstream transportation and delivery	All	thousand t-CO_2e	491	489	419	454	450
Category 5 Waste generated in operations	All	thousand t-CO_2e	100	57	45	58	62
Category 6 Business travel	All	thousand t-CO_2e	4	4	4	5	4
Category 7 Employee commuting	All	thousand t-CO_2e	49	49	51	59	49
Category 15 Investments	All	thousand t-CO_2e	1,186	1,097	927	1,022	967

*1 Data cover 76 companies
- JFE Steel and 26 major domestic and overseas subsidiaries
- JFE Engineering and 12 major domestic and overseas subsidiaries
- JFE Shoji and 35 major domestic and overseas subsidiaries.

*2 Starting with FY2021, figure includes data for an expanded list of JFE Steel, JFE Engineering, and JFE Shoji subsidiaries.
*3 Data for JFE Steel include CO_2 emissions from non-energy sources.
*4 Data for 1 JFE Steel major domestic subsidiary and a JFE Engineering major domestic subsidiary include CO_2 emissions from non-energy sources.
*5 CO_2 Emission Factor for Purchased Electricity in FY2022:
- JFE Steel uses the emission factor of the Commitment to a Low Carbon Society of the Japan Iron and Steel Federation for energy purchased in FY2021.
- JFE Steel's domestic consolidated subsidiaries, the JFE Engineering Group, and the JFE Shoji Group apply the adjusted emission factors of each electric power company for each fiscal year.
- Over seas: the latest IEA emission factors

*6 Coverage:
(Categories 1, 2, 3, 4, 5) JFE Steel, 21 JFE Steel major domestic subsidiaries, JFE Engineering, 1 JFE Engineering major domestic subsidiary, and JFE Shoji
(Category 6, 7) JFE Steel, 21 JFE Steel major domestic subsidiaries, JFE Engineering, 15 JFE Engineering major domestic and overseas subsidiaries, and JFE Shoji
(Category 15) Japan Marine United, and 10 JFE Steel equity-method affiliates (7 domestic and 3 overseas)
*7 Sources: Green Value Chain Platform (Ministry of the Environment) and others

■ Other Greenhouse Gas

Items		Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
CO_2 emissions from energy sources	CO_2 emissions (Scopes 1 and 2 total)	ST Gr	million t-CO_2	57.0	57.4	50.2	55.8	53.1
		ST	million t-CO_2	53.5	54.2	47.3	52.6	50.4
		ST subsidiaries	million t-CO_2	3.5	3.2	2.9	3.2	2.7
		EN Gr*1*2	thousand t-CO_2	66.7	67.5	62.5	61.4	45.2
	Scope1	ST	million t-CO_2	47.3	47.9	41.9	46.8	44.5
	Unit: CO_2 emissions (denominator: crude steel production)	ST	t-CO_2/ t-steel	2.03	2.03	2.08	2.03	2.09
CO_2 emissions from non-energy sources		ST Gr*3	million t-CO_2	2.61	2.65	2.40	2.74	2.59
		ST	million t-CO_2	1.87	1.89	1.82	2.05	1.93
		ST subsidiaries	million t-CO_2	0.74	0.76	0.58	0.69	0.66
		EN subsidiaries*4	million t-CO_2	0.15	0.34	0.42	0.33	0.38

Items		Scope	Unit	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
GHG emissions other than CO_2		All	thousand t-CO_2e	88.7	103.3	96.1	103.0	55.2
	Methane (CH_4)	ST Gr	thousand t-CO_2e	72.2	72.9	68.3	74.6	35.4
		ST	thousand t-CO_2e	72.2	72.9	68.3	74.6	35.4
		ST subsidiaries	thousand t-CO_2e	—	—	—	0.005	0.005
	N_2O	All	thousand t-CO_2e	16.5	30.4	27.9	28.5	19.8
		ST Gr	thousand t-CO_2e	16.5	20.0	15.5	17.7	7.8
		ST	thousand t-CO_2e	16.5	20.0	15.5	17.7	7.8
		ST subsidiaries	thousand t-CO_2e	—	—	—	0.004	0.004
		EN subsidiaries*4	thousand t-CO_2e	—	10.4	12.4	10.8	12.0
GHG emitted during transportation*5		ST Gr	million t-CO_2	66	65	57	63	61
		ST	million t-CO_2	40	40	34	38	37
		ST subsidiaries	million t-CO_2	26	25	23	25	24
Contribution to CO_2 emission reductions*6		EN Gr	million t-CO_2/year	412	413	965	1,057	1,114
	Biomass power generation	EN Gr	million t-CO_2/year	212	212	274	286	294
	Waste power generation	EN Gr	million t-CO_2/year	153	153	337	340	372
	Others*7	EN Gr	million t-CO_2/year	47	48	354	357	359
	Recycling (Includes fluorocarbon recovery and energy creation)	EN Gr	million t-CO_2/ year	—	—	—	74	89

*1 Data cover JFE Engineering and 12 major domestic and overseas subsidiaries.
*2 Starting with FY2021,expanded coverage of major subsidiaries for JFE Engineering.
*3 Data cover JFE Steel and a major domestic subsidiary.
*4 J&T Recycling Co. is a domestic subsidiary of JFE Engneering.
*5 Data cover JFE Steel and 9 major domestic subsidiaries, which are specified consigners designated under the Japanese Energy Saving Act.
*6 Coverage:
- Up to FY2019, only JFE Engineering's domestic business is covered
- FY2020 data cover JFE Engineering's domestic and overseas businesses and its German subsidiary Standardkessel Baumgarte GmbH (SBG)
- From FY2021, JFE Engineering's domestic and overseas businesses, J&T Recycling Corporation, JFE Urban Recycle Corporation, and German subsidiary Standardkessel Baumgarte GmbH (SBG) are covered

*7 Others (digestion gas, geothermal, solar power, wind, waste heat recovery, fuel conversion, sludge incineration, PPA, energy services)

■ Energy

Items		Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Energy consumption and unit energy consumption	Energy consumption	All	PJ	—	670	592	654	627
		ST Gr	PJ	—	669	591	652	625
		ST	PJ	613	620	545	602	581
		ST subsidiaries	PJ	—	48.8	45.2	49.6	43.9
		EN Gr	PJ	—	1.3	1.2	1.3	1.2
		SH Gr	PJ	—	0.6	0.6	0.7	0.7
	Unit energy consumption (crude steel production)	ST	GJ/ t-steel	23.3	23.2	24.0	23.3	24.1
	Energy consumption (Crude petroleum equivalent)	EN	kl	10,886	8,788	8,000	7,636	7,772
	YOY ratio of unit energy consumption	EN	%	95.4	80.7	91.0	95.5	107.9
Recovered energy for recycling	Supplied to society	ST	%	39	39	38	38	37
	Consumed internally	ST	%	61	61	62	62	63

■ Modal Shift Rate

Items		Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
All transportation	Ship and rail	ST	%	60.2	59.6	58.4	58.3	59.0
	Truck	ST	%	39.8	40.4	41.6	41.7	41.0
Transportation of a distance of 500 km or more	Ship and rail	ST	%	91.6	90.9	91.6	90.0	92.1
	Truck	ST	%	8.4	9.1	8.4	10.0	7.9

Scope of calculation: All products and half-finished products transported in Japan

Climate Change (Supplementary Data)

■ CO_2 Emissions and Energy Consumption of JFE Steel Group Subsidiaries (FY2022)

Company name	CO_2 emissions (unit: thousand t-CO_2)	Energy consumption (unit: PJ)
JFE Mineral & Alloy Company, Ltd.*	1,389.6	10.71
JFE Bars & Shapes Corporation	504.2	10.19
JFE Chemical Corp.	214.1	4.42
JFE LOGISTICS CORPORATION	161.1	2.32
JFE Galvanizing & Coating Co., Ltd.	56.0	1.20
JFE Plastic Resource Corporation	20.9	0.40
MIZUSHIMA RIVERMENT CORP.	9.2	0.14
JFE Container Co., Ltd.	10.2	0.21
J-Logitec Co., Ltd.	7.5	0.11
Galvatex Corporation	3.9	0.08
JFE Metal Products & Engineering Inc.	7.4	0.18
JFE Welded Pipe Manufacturing Co., Ltd.	9.4	0.16
JFE Techno-wire Corporation	4.4	0.09
JFE PRECISION CORPORATION	3.8	0.07
K-PLASHEET CORPORATION	4.5	0.08
JFE LIFE CORPORATION	3.9	0.11
CHIBA RIVERMENT AND CEMENT CORP.	6.7	0.13
JFE Steel Pipe Co., Ltd.	2.9	0.06
GECOSS CORPORATION	3.7	0.06
JFE Kozai Corporation	3.8	0.07
JFE Ferrite Corporation	3.6	0.07
5 overseas companies	933.9	13.06
Total	3,364.8	43.92

* Data for Mineral & Alloy Company, Ltd. since FY2021 has included CO2 emissions from Mizushima Ferroalloy Co., Ltd. and JFE Material Co., Ltd., which merged into JFE Mineral & Alloy Company in April 2022.

■ CO_2 Emissions from Energy Sources and Energy Consumption of JFE Engineering Group Subsidiaries (FY2022)

Company name	CO_2 emissions (unit: thousand t-CO_2)	Energy consumption (unit: PJ)
J&T Recycling Corporation	29.2	0.8
J Farm Corporation	2.1	0.040
Fujikako, Inc.	1.3	0.034
NORTHERN JAPAN MACHINERY Corporation	1.1	0.018
TOHOKU DOCK TEKKO CO., LTD.	0.9	0.017
JFE Environmental Service Corporation	0.6	0.011
Asuka Soken Co., Ltd.	0.8	0.013
JFE Pipeline Engineering Corporation	0.4	0.006
JFE Technos Corporation	0.1	0.003
JFE Aqua Machine and Service Corporation	0.0	0.001
JFE Project One Co., Ltd.	0.1	0.001
J&M Steel Solutions Company Limited	0.5	0.011
Total	37.2	0.921

Prevention of Pollution

■ Air Emissions

Items	Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
SOx emissions*1	ST Gr	million Nm^3	4.1	4.3	3.3	3.5	3.3
	ST	million Nm^3	4.1	4.3	3.3	3.5	3.3
	ST subsidiaries	million Nm^3	0.04	0.04	0.03	0.03	0.04
NOx emissions*2	ST Gr	million Nm^3	10.7	11.3	10.4	11.4	10.2
	ST	million Nm^3	10.5	11.1	10.3	11.2	10.1
	ST subsidiaries	million Nm^3	0.19	0.17	0.14	0.18	0.15

*1 10 JFE Steel consolidated subsidiaries in Japan.
*2 11 JFE Steel consolidated subsidiaries in Japan.

■ Release to Waterways

Items	Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
COD (chemical oxygen demand)	All*1	t/day	3.5	3.4	3.1	3.1	3.1
	ST	t/day	3.3	3.2	2.9	2.9	2.8
	ST subsidiaries	t/day	0.17	0.15	0.17	0.23	0.25
	EN*2	kg/day	6.8	8.4	8.7	8.4	6.6

*1 Coverage:
- JFE Steel and 10 consolidated subsidiaries in Japan.
- JFE Engineering

*2 This report uses the maximum value of each year.

■ Chemical Substances Management

Items		Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
PRTR-registered substances*1*2	Amount released	All*3	t	1,019	918	754	827	750
		ST Gr	t	814	766	596	672	609
		ST	t	545	481	341	380	366
		ST subsidiaries	t	269	285	255	292	243
		EN Gr	t	205	152	158	155	141
		EN	t	147	107	121	116	103
		EN subsidiaries	t	58.4	45.4	36.7	39.3	37.8
	Amount transferred	All*3	t	9,210	7,866	5,949	9,845	12,809
		ST Gr	t	9,176	7,832	5,910	9,811	12,779
		ST	t	2,533	1,865	1,694	1,378	1,278
		ST subsidiaries	t	6,643	5,967	4,216	8,433	11,501
		EN Gr	t	34	34	39	34	30
		EN	t	28	29	26	30	26
		EN subsidiaries	t	5.7	5.4	12.5	4.4	4.4

*1 Coverage:
- JFE Steel and 15 consolidated subsidiaries in Japan.
- JFE Engneering and 4 consolidated subsidiaries in Japan.

*2 Excluding dioxins

*3 JFE Shoji is not included in the scope of the report as the company is not subject to PRTR registration.

Prevention of Pollution (Supplementary Data)

■ SOx and NOx Emissions of JFE Steel Group Subsidiaries (FY2022)

Company name	SOx emissions(unit: Nm^3)	NOx emissions(unit: Nm^3)
JFE Mineral & Alloy Company, Ltd.	17,206	75,518
CHIBA RIVERMENT AND CEMENT CORP.	56	741
MIZUSHIMA RIVERMENT CORP.	0	879
JFE PRECISION CORPORATION	1,751	547
JFE Plastic Resource Corporation	125	62
JFE Bars & Shapes Corporation	4,129	10,056
JFE Metal Products & Engineering Inc.	32	1,442
JFE KENZAI FENCE CO., LTD.	0	0
JFE Galvanizing & Coating Co., Ltd.	1,425	13,226
JFE Container Co., Ltd.	88	0
JFE Welded Pipe Manufacturing Co., Ltd.	0	0
JFE Steel Pipe Co., Ltd.	0	0
Galvatex Corporation	0	877
JFE Techno-wire Corporation	0	0
JFE Kozai Corporation	0	0
GECOSS CORPORATION	0	0
JFE LOGISTICS CORPORATION	0	0
J-Logitec Co., Ltd.	0	0
JFE Chemical Corp.	10,051	41,900
K-PLASHEET CORPORATION	149	0
JFE LIFE CORPORATION	0	0
Total	35,012	145,248

Efficient Use of Natural Resources

■ Natural Resources

Items			Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Input	Raw materials for steel production		ST	million t	66.0	67.0	58.7	59.3	62.2
		Iron ore	ST	million t	40.1	41.4	35.4	40.2*	37.5
		Coal	ST	million t	20.6	20.3	18.1	19.9	19.1
		Lime	ST	million t	5.3	5.3	5.2	5.9	5.6
	Recycled materials (steel scrap)		ST	million t	1.3	1.1	0.8	1.2	0.9
	Raw materials		EN	thousand t	47.3	39.4	36.9	38.6	27.9
Products supplied	Steel products		ST	million t	26.3	26.7	22.8	25.9	24.1
	Engineering products		EN	thousand t	44.5	36.6	34.7	37.4	27.0

* Revised the prior year data to increase accuracy.

■ Co-products and Wastes

Items			Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Co-products	Amount generated*1		ST Gr	million t	16.1	15.6	13.9	14.4	14.1
		ST*2		million t	15.3	15.1	13.4	13.9	13.5
		ST subsidiaries		million t	0.8	0.5	0.5	0.5	0.6
	Amount recycled internally		ST	million t	6.0	5.0	3.3	3.3	2.9
	Internal recycle rate		ST	%	39.3	32.9	24.9	24.0	21.7
	Emissions*1		ST Gr	million t	9.4	10.3	10.2	10.8	10.8
		ST		million t	9.3	10.2	10.1	10.6	10.6
		ST subsidiaries		million t	0.1	0.1	0.1	0.2	0.2
	Used by local communities		ST	million t	9.2	10.1	10.0	10.5	10.5
	Rate of local communities use		ST	%	60.4	66.8	74.8	75.7	77.8
	Landfill amount*1		ST Gr	million t	0.081	0.074	0.060	0.094	0.167
		ST		million t	0.052	0.043	0.037	0.042	0.073
		ST subsidiaries		million t	0.029	0.031	0.023	0.052	0.094
	Recycling rate		ST	%	99.7	99.7	99.7	99.7	99.5

Items		Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Wastes	Emissions*3*4	EN Gr	thousand t	131.7	211.0	159.1	249.2	223.7
	Offices	EN	t	386.4	367.1	329.2	235.3	259.4
		Yokohama HO	t	299.9	299.0	256.9	156.7	195.0
		Tsu works	t	86.5	68.2	72.3	78.6	64.4
	Productions	EN	t	1,039.3	1,340.5	1,072.3	803.0	821.4
		Tsurumi works	t	506.6	653.8	519.8	364.7	461.6
		Tsu works	t	532.7	686.7	552.5	438.3	359.8
	Constructions	EN	t	109,045.2	145,397.7	97,387.9	190,242.3	162,747.2
	Subsidiaries	EN subsidiaries	t	22,634.4	63,876.7	60,296.7	57,960.3	59,841.4
	Recycling rate (offices)	EN	%	96.7	97.3	96.8	96.1	96.4
		Yokohama HO	%	98.5	98.8	99.1	98.5	98.4
		Tsuworks	%	85.2	85.2	87.2	88.4	85.7
	Recycling rate (production)	EN	%	46.8	68.0	48.8	46.8	54.0
		Tsurumi works	%	68.7	79.4	72.0	68.3	75.9
		Tsuworks	%	32.1	60.9	33.8	28.0	25.0
	Recycling rate (construction)	EN	%	98.4	97.1	98.3	98.6	99.3
	Landfill	EN	t	2,125.1	4,489.3	2,011.6	3,035.6	1,456.7
	Offices	EN	t	10.7	8.5	9.1	7.4	7.7
		Yokohama HO	t	4.1	3.3	2.1	2.2	2.9
		Tsuworks	t	6.6	5.2	7.0	5.2	4.8
	Productions	EN	t	353.3	312.6	351.2	322.6	287.7
		Tsurumi works	t	83.2	77.3	75.2	89.4	85.9
		Tsuworks	t	270.1	235.3	276.0	233.2	201.8
	Constructions	EN	t	1,761.1	4,168.2	1,651.3	2,705.6	1,161.3
	Recycling rate	EN	%	97.0	95.8	95.9	96.5	97.4

*1 Data cover JFE Steel and 22 consolidated subsidiaries in Japan.
*2 Byproducts generated by JFE Steel are mostly reused as offshore, land, or construction materials.
*3 Data cover JFE Engineering and 10 consolidated subsidiaries in Japan.
*4 Data from FY2019 includes wastes generated at offices and productions of JFE Engneering.

■ Wastes at JFE Engineering Construction Sites

Items		Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Rubble	Amount generated	EN	t	78,410	113,637	78,100	159,309	141,888
	Recycle rate	EN	%	99.6	98.6	99.4	99.4	99.9
	Landfill amount	EN	t	297	1,533	484	940	173
Sludge	Amount generated	EN	t	16,142	17,225	12,399	24,350	14,806
	Recycle rate	EN	%	98.8	98.8	98.9	96.9	99.0
	Landfill amount	EN	t	199	205	135	683	130
Industrial waste excluding rubble and sludge	Amount generated	EN	t	14,494	13,788	6,678	6,583	6,054
	Recycle rate	EN	%	91.0	85.0	85.4	81.6	84.4
	Landfill amount	EN	t	1,265	1,923	868	1,083	858

■ Paper Consumption at JFE Shoji

Items	Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Consumption of copier papers	SH*	boxes	4,832	4,675	3,021	3,033	2,860
	Tokyo	boxes	2,661	2,516	1,333	1,471	1,376
	Osaka	boxes	372	399	310	337	351
	Nagoya*	boxes	217	293	157	154	177
	Branch*	boxes	1,582	1,467	1,221	1,071	956

* Revised the prior year data to increase accuracy.

Water Security

■ Water

Items	Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Amount of water accepted*1	All	million t	240	242	237	246	240
	ST Gr	million t	238	241	236	245	239
	ST	million t	218	221	215	226	220
	ST subsidiaries	million t	20.5	19.8	20.9	18.7	18.2
	EN Gr	million t	0.918	1.410	1.296	1.141	1.35
	EN	million t	0.102	0.106	0.072	0.063	0.064
	EN subsidiaries	million t	0.816	1.304	1.223	1.078	1.28
	SH Gr	million t	0.165	0.149	0.160	0.154	0.154
	SH	million t	—	—	—	—	—
	SH subsidiaries	million t	0.165	0.149	0.160	0.154	0.154
Amount of water released*2	ST Gr	million t	144	143	141	144	143
	ST	million t	126	126	123	128	128
	ST subsidiaries	million t	18.0	17.0	18.3	15.6	15.4
	EN	million t	0.146	0.126	0.157	0.132	0.122
Amount of water consumption*2	ST Gr	million t	3,665	3,616	3,331	3,442	3,475
	ST	million t	3,376	3,323	3,066	3,207	3,242
	ST subsidiaries	million t	289	293	265	235	233
Amount evaporated	ST	million t	92	95	92	98	92
Ratio of amount released and evaporated	ST	%	6.5	6.6	7.0	7.0	6.8
Amount recycled*2	ST Gr	million t	3,427	3,375	3,096	3,197*4	3,237
	ST	million t	3,158	3,102	2,851	2,981*4	3,242
	ST subsidiaries	million t	269	273	245	216	215
Recycling rate*2*3	ST	%	93.5	93.4	93.0	93.0	93.2
	ST subsidiaries	%	93	93	92	92	92

*1 Coverage:
- JFE Steel and 22 consolidated subsidiaries in Japan.
- JFE Engineering and 7 consolidated subsidiaries in Japan.
- 33 JFE Shoji domestic and overseas consolidated subsidiaries.

*2 Data cover JFE Steel and 22 JFE Steel consolidated subsidiaries in Japan.

*3 Industrial water circulated (%) = (Total amount – industrial water accepted)/total amount used × 100

*4 Revised the prior year data to increase accuracy.

■ Water Related Data by Water Intake Source and Discharge Source

Items	Scope	Unit	FY2018	FY2019	FY2020	FY2021	FY2022
Total amount accepted	All*	million t	218.4	221.0	214.8	226.1	220.4
River/lake		million t	0	0	0	0	0
Groundwater		million t	0	0	0	0	0
Industrial water/ waterworks		million t	218.4	221.0	214.8	226.1	220.4
Ocean		million t	0	0	0	0	0
Rainwater		million t	0	0	0	0	0
Other intake source		million t	0	0	0	0	0
Total amount released	All*	million t	126.1	126.8	123.6	128.8	128.5
Ocean		million t	125.7	126.3	123.1	128.3	128.1
Surface water		million t	0	0	0	0	0
Underground/well		million t	0	0	0	0	0
Off-site water processing		million t	0.4431	0.4502	0.4796	0.4709	0.4300
Beneficial use/other use		million t	0	0	0	0	0
Other discharge source		million t	0	0	0	0	0

* Data cover JFE Steel and JFE Engineering.

Water Security (Supplementary Data)

■ Amount of Water Accepted and Released at JFE Steel Group Subsidiaries (FY2022)

Company name	Amount accepted (unit: thousand tonnes)	Amount released (unit: thousand tonnes)
JFE Mineral & Alloy Company, Ltd.	6,353	5,946
CHIBA RIVERMENT AND CEMENT CORP.	10	10
MIZUSHIMA RIVERMENT CORP.	14	14
JFE PRECISION CORPORATION	148	148
JFE Plastic Resource Corporation	18	18
JFE Bars & Shapes Corporation	4,796	2,707
JFE Metal Products & Engineering Inc.	120	138
JFE KENZAI FENCE CO., LTD.	51	51
JFE Galvanizing & Coating Co., Ltd.	548	605
JFE Container Co., Ltd.	251	251
JFE Welded Pipe Manufacturing Co., Ltd.	29	29
JFE Steel Pipe Co., Ltd.	2	2
Galvatex Corporation	651	651
JFE Techno-wire Corporation	93	93

Company name	Amount accepted (unit: thousand tonnes)	Amount released (unit: thousand tonnes)
JFE Kozai Corporation	14	14
GECOSS CORPORATION	67	68
JFE LOGISTICS CORPORATION	104	104
J-Logitec Co., Ltd.	3	3
JFE Chemical Corp.	4,369	4,002
K-PLASHEET CORPORATION	30	26
JFE LIFE CORPORATION	504	493
Total	18,176	15,373

■ Amount of Water Accepted at JFE Engineering Group Subsidiaries (FY2022)

Company name	Amount accepted (unit: thousand tonnes)
J&T Recycling Corporation	1,231
JFE Environmental Service Corporation	30.5
NORTHERN JAPAN MACHINERY Corporation	0.002
TOHOKU DOCK TEKKO CO., LTD.	0.03
JFE Aqua Machine and Service Corporation	0.002
Fujikako, Inc.	0.02
J Farm Corporation	22.2
Total	1,283

Social Data

Responsibility to Customers

■ Customer Training (FY2022)

Name of training	Scope	Unit	Participants
Technical presentation by overseas Group companies (number of participating companies*)	JFE Shoji	People (companies)	78 (15)

* Participants from nine countries

Human Capital

■ Lost-work Injuries and Accidents

Items		Scope*1	Unit	2018	2019	2020	2021	2022
Lost-work Injuries and Severity (Rates)	Lost-work injuries*2	JFE Steel	—	0.17	0.28	0.23	0.10	0.18
	Severity*3		—	0.15	0.30	0.08	0.08	0.08
	Lost-work injuries*2	JFE Engineering	—	0.82	0.45	0.35	0.56	0.26
	Severity*3		—	0.02	0.62	0.01	0.40	0.01
	Lost-work injuries*2	JFE Shoji Group	—	0.60	1.00	0.76	0.60	0.25
	Severity*3		—	0.04	0.02	0.04	0.05	0.02
	Lost-work injuries*2	Manufacturing industry average	—	1.20	1.20	1.21	1.31	1.25
	Severity*3		—	0.10	0.10	0.07	0.06	0.08
Number of lost-work injuries	Lost-work injuries	JFE Group	Cases	41	49	36	26	25
	Fatal injuries		Cases	2	6	1	2	1
	Lost-work injuries	JFE Steel	Cases	18	30	23	10	18
	Fatal injuries		Cases	2	4	1	1	1
	Lost-work injuries	JFE Engineering	Cases	18	11	7	11	5
	Fatal injuries		Cases	0	2	0	1	0
	Lost-work injuries	JFE Shoji Group	Cases	5	8	6	5	2
	Fatal injuries		Cases	0	0	0	0	0

Items		Scope*1	Unit	2018	2019	2020	2021	2022
Lost-work Injuries Involving Employees	Lost-work injuries	JFE Group	Cases	13	18	15	10	13
	Fatal injuries		Cases	1	1	0	0	1
	Lost-work injuries	JFE Steel	Cases	7	10	9	5	11
	Fatal injuries		Cases	1	1	0	0	1
	Lost-work injuries	JFE Engineering	Cases	1	2	2	1	0
	Fatal injuries		Cases	0	0	0	0	0
	Lost-work injuries	JFE Shoji Group	Cases	5	6	4	4	2
	Fatal injuries		Cases	0	0	0	0	0
Lost-work injuries involving employees of contractors	Lost-work injuries	JFE Group	Cases	28	31	21	16	12
	Fatal injuries		Cases	1	5	1	2	0
	Lost-work injuries	JFE Steel	Cases	11	20	14	5	7
	Fatal injuries		Cases	1	3	1	1	0
	Lost-work injuries	JFE Engineering	Cases	17	9	5	10	5
	Fatal injuries		Cases	0	2	0	1	0
	Lost-work injuries	JFE Shoji Group	Cases	0	2	2	1	0
	Fatal injuries		Cases	0	0	0	0	0

*1 Scope of data:
- JFE Steel and JFE Engineering: parent company, business associates and contractors in Japan
- JFE Shoji : parent and consolidated subsidiaries, business associates and contractors in Japan

*2 Lost-work injuries (rate) = number of employees with lost-work injuries/total working hours × 1,000,000

*3 Severity = number of lost working days/total working hours × 1,000

■ Health and Safety Training (FY2022)

Items	Unit	Participants*
Training for managers and supervisors	People	409
Mental healthcare education for new hires and at rank-based training	People	751

* Total of 3 operating companies.

■ Health Data

Items	Scope	Unit	2018	2019	2020	2021	2022
Provision rate of health guidance*1	JFE Steel	%	56.9	64.2	53.0	72.2	—
	JFE Engineering	%	22.1	39.6	39.1	30.6	—
	JFE Shoji	%	45.2	36.0	41.6	32.1	—
Smoking rates	JFE Steel*2	%	32.4	31.8	29.0	27.3	26.6
	JFE Engineering	%	26.7	26.4	23.3	22.9	22.3
	JFE Shoji*3	%	24.8	24.9	24.9	21.5	21.9
Metabolic syndrome rates	Insured by the JFE Group's health insurance union (age 40 and above)	%	36.0	35.6	36.5	36.3*4	36.0
Rate of health examination for dependents	Age 40 and above	%	48.2	51.5	46.3	51.3	51.5

*1 Figures for FY2022 will be added once they are finalized.
*2 Smoking rate for JFE Steel is managed based on calendar year.
*3 Smoking rates for JFE Shoji for FY2018 represent results for those age 40 and above.
*4 Revised the prior year data to increase accuracy.

■ Employee Data (FY2022*1)

Category	Consolitaded/ non-consolitaded	Unit	JFE Steel	JFE Engineering	JFE Shoji
Employees	Conslidated*2	people	44,469	11,086	8,631
Male		people	38,682	9,592	6,201
Female		people	5,787	1,494	2,430
Management positions*3		people	11,690	3,768	1,746
Male		people	10,858	3,542	1,497
Female		people	832	226	249
Ratio of women in management positions		%	7.1	6.0	14.3
Employees	Non-consloitaded*2	people	15,185	3,846	1,035
Male		people	13,909	3,294	613
Female		people	1,276	552	422
Management positions (manager or higher)*3		people	1,641	1,617	614
Male		people	1,613	1,566	567
Female		people	28	51	47
Ratio of women in management positions		%	1.7	3.2	7.7
Recruits		people	320	152	80
Male		people	293	120	53
Female		people	27	32	27
New graduates		people	240	86	59
Mid-career professionals		people	80	66	21
Years of continuous employment (average)		year	16.7	15.4	12.3
Male		year	16.4	15.4	12.5
Female		year	19.8	15.3	11.9
Job turnover rate*4 (total2.7%)		%	2.8	2.3	3.4
Elderly employees*5		people	687	42	22
Ratio of elderly employees*5		%	4.5	1.1	2.1
Average annual leave taken		day/year	16.7	19.1	14.5
Average overtime		hours/ month	25.1	26.7	28.7
Employees working shorter hours for childcare (aggregated)		people	82	56	65
Ratio of male employees taking childcare leave*6		%	92	94	113
Wage gap between men and women*7 (all workers)		%	78.3	62.9	64.9
Full-time employees		%	78.8	62.6	64.7
Part-time workers and fixed-term employees		%	72.1	58.6	64.2
Temporary staffs		people	157	656	34

*1 As of April 1, 2023. Other figures are as of FY2022.
*2 Scope of data: Consolidated subsidiaries JFE Steel: 149, JFE Engineering: 80 JFE Shoji: 127
*3 Management positions at JFE Shoji include employees on loan.
*4 Percentage of employees who voluntarily choose to resign from the organization.
*5 Figures for JFE Steel include active employees who are age 60 and above (the company's mandatory retirement age has been raised to 65).
*6 Rate of male employees taking childcare leave or time off related to child rearing = (Number of male employees who took childcare leave + Number of male employees who used the childcare leave program for pre-elementary school children) / Number of male employees whose spouses have given birth.
*7 Calculated in accordance with the provisions of the Act on the Promotion of Women's Active Engagement in Professional Life.

■ Recruiting for New Graduates (FY2023) and Mid-career Professionals (FY2022) (Three Operating Companies, Excluding their Subsidiaries)

Items	Unit	Career-track Positions			On-site and Clerical Positions	Total
		White-collar	Technical	Total		
Male	people	115	181	296	170	466
Female	people	53	24	77	9	86
Total	people	168	205	373	179	552
Ratio of women	%	31.5	11.7	20.6	5.0	15.6

■ Employment of People with Disabilities (as of June 1 of each year)

Items	Scope	Unit	2018	2019	2020	2021	2022
Employment of People with Disabilities	JFE Steel	%	2.41	2.48	2.51	2.51	2.57
	JFE Engineering	%	2.39	2.23	2.37	2.53	2.58
	JFE Shoji	%	2.62	2.50	2.39	2.39	2.66

Community

■ Social Contributions (FY2022)

Activities		Scope		Unit	Achievements
Internships		JFE Group		People	1,431
			JFE Steel	People	455
			JFE Engineering	People	631
			JFE Shoji	People	345
Supporting elementary schools in Ghana and Nigeria	Desks and chairs	JFE Shoji		Sets	475
	Notebooks			Books	17,000
	Canned foods			Cans	12,500

■ JFE 21st Century Foundation (FY2022)

Grants		Projects	Value (million yen)
Technology research (accumulated)		710	142,780
Technology research for FY2022	Iron and steel technology research	13	2,600
	Global environment and global warming prevention technology research	15	3,000
Asian history studies (accumulated)		162	24,300
Asian history studies for FY2022		12	1,800
Activities		Sets donated	
Supporting the Japan Overseas Educational Services Writing Contest and anthology donation (to elementary and middle schools and also public libraries in the regions related to steel*)		2,300	

* Donated to 654 elementary schools and middle schools, 31 libraries, etc.

Shareholders and Investors

■ Major IR Activities (FY2022)

Activities	Frequency per Year	Scale, etc.
Ordinary general meeting of shareholders	1	Approx. 220,000 shareholders
Individual meetings primarily targeting institutional investors and securities analysts	In Japan: 51 companies (162 meetings) Overseas: 65 companies (130 meetings)	
Meetings with shareholders, primarily ESG managers or those with voting rights at institutional investors	In Japan: 23 companies (48 meetings) Overseas: 17 companies (17 meetings)	
Investor meetings and ESG Briefings for analysts and persons responsible for ESG	5	Approx. 1,100 persons in total
Web-based briefings for individual investors	1,000 real-time participants Over 10,000 views	
Business site and plant tours for individual shareholders	11	Approx. 1,500 persons
Newsletters (JFE Dayori)	2 (mid-year and annual)	Approx. 280,000 copies/issue
Various reports, including integrated reports and sustainability reports*	1	Approx. 23,000 copies
Information via websites, etc., for shareholders and investors	As needed	

* Number of issues published is for the integrated report. The sustainability report is disclosed only via the website.

Governance Data

Corporate Governance

■ Corporate Governance System

As of July 1, 2023

Items	Overview of the system
Organizational design type	Company with an Audit and Supervisory Board
Number of Directors (members)	8
The number of Independent Outside Directors (members)	3
The number of female Directors (member)	1
Number of Audit & Supervisory Board Members (members)	5
The number of Independent Outside Audit & Supervisory Board Members (members)	3
The number of femal Audit & Supervisory Board Members (members)	1
Term for Directors (years)	1
Term for Outside Directors (years)	1
Corporate Officer System	Adopted
Voluntary advisory committees of the Board of Directors	Nomination Committee and Remuneration Committee

■ Directors and Audit & Supervisory Board members

As of July 1, 2023

Position		Name	Significant concurrent post	Independent executive	Number of meetings of the Board of Directors attended in FY2022	Number of meetings of the Audit & Supervisory Board attended in FY2022
Director	Inside	Koji Kakigi	Chairman of the Board of Directors of JFE 21st Century Foundation (Public Interest Incorporated Foundation)	—	15/15 (100%)	—
		Yoshihisa Kitano	Representative Director, President and CEO of JFE Steel Corporation	—	15/15 (100%)	—
		Masashi Terahata	Director of JFE Steel Corporation, Representative Director of JFE 21st Century Foundation (Public Interest Incorporated Foundation)	—	15/15 (100%)	—
	Inside	Hajime Oshita	Representative Director, President and CEO of JFE Engineering Corporation	—	15/15 (100%)	—
		Toshinori Kobayashi	Representative Director, President and CEO of JFE Shoji Corporation	—	15/15 (100%)	—
	Outside	Masami Yamamoto	Director and Senior Advisor of Fujitsu Limited, Outside Director of Mizuho Financial Group, Inc.	○	15/15 (100%)	—
		Nobumasa Kemori	Honorary Advisor of Sumitomo Metal Mining Co., Ltd., Outside Director of Sumitomo Realty & Development Co., Ltd.	○	15/15 (100%)	—
		Yoshiko Ando	Audit & Supervisory Board Member of Kirin Holding Company, Limited, Outside Director of Sansei Technologies, Inc.	○	15/15 (100%)	—
Audit & Supervisory Board Member	Inside	Nobuya Hara	Audit & Supervisory Board Member of JFE Steel Corporation	—	15/15 (100%)	19/19 (100%)
		Nakaba Akimoto	Audit & Supervisory Board Member of JFE Engineering Corporation, Audit & Supervisory Board Member of JFE Shoji Corporation	—	12/12 (100%)	13/13 (100%)
	Outside	Isao Saiki	Partner Lawyer of Abe, Ikubo & Katayama Law Firm	○	15/15 (100%)	19/19 (100%)
		Tsuyoshi Numagami	Professor, Institute for Business and Finance, Waseda University External Director of Tokyo Century Corporation Independent Director of EBARA CORPORATION	○	15/15 (100%)	19/19 (100%)
		Takuya Shimamura	Director and Chairman of AGC Inc. Independent Director of EBARA CORPORATION	○	12/12 (100%)	13/13 (100%)

* The number of meetings of the Board of Directors and Audit & Supervisory Board Members held during FY2022 differs for Ms. Nakaba Akimoto and Mr. Takuya Shimamura, as They were elected for the first time as Audit & Supervisory Board Members at the previous year's Ordinary General Meeting of Shareholders (held on June 24, 2022).

■ Nomination Committee and Remuneration Committee

As of July 1, 2023

Items		Members	Chairperson	Number of meetings held during FY2022
Nomination Committee		6	Masami Yamamoto (Outside Director)	3
	Inside Director	2		
	Outside Director	2		
	Outside Audit & Supervisory Board Member	2		
Remuneration Committee		6	Nobumasa Kemori (Outside Director)	6
	Inside Director	2		
	Outside Director	2		
	Outside Audit & Supervisory Board Member	2		

■ Operating System

Committee	Company	Chairperson	Attendees
Group Management Strategy Committee	JFE Holdings	President	Inside Directors (including 3 operating company Presidents), Corporate Officers and full-time Audit & Supervisory Board Members
Management Committee	JFE Holdings	President	Inside Directors (excluding 3 operating company Presidents), Corporate Officers and full-time Audit & Supervisory Board Members
	Each operating company	President	Directors, major Corporate Officers and Audit & Supervisory Board Members

■ Executive Remuneration

FY2022

Executive remuneration						
Position Type	Total remuneration, etc. (million yen)	Total amount by remuneration type (million yen)*2				Number of Executives (members)
		Basic remuneration	Bonus	Stock remuneration*3		
				Linked to performance	Linked to service length	
Directors (excluding Outside Directors)	303,881	217,415	48,890	23,912	13,664	5
Audit & Supervisory Board Members (excluding Outside Audit & Supervisory Board Members)*1	78,335	78,335	—	—	—	3
Outside Directors/ Audit & Supervisory Board Members	91,847	91,847	—	—	—	7

*1 The number of audit & supervisory board members (excluding outside audit & supervisory board members) includes one audit & supervisory board member who retired during the current fiscal year.

*2 Directors' (excluding outside directors) performance-linked remuneration is composed of bonus and stock remuneration. Total amount of performance-linked remuneration for the current fiscal year is 72.802 million yen.

*3 Only directors (excluding outside directors) are included in the scope of the above-mentioned stock remuneration, and the entire amount is non-monetary remuneration. Total amount of stock remuneration expensed for the current fiscal year as non-monetary remuneration is 37.576 million yen.

Officers whose consolidated remuneration exceeded 100 million yen								
Name	Position	Company	Total (consolidated basis) (million yen)	Per company (consolidated basis) (million yen)	Total amount by remuneration type (million yen)			
					Basic remuneration	Bonus	Stock remuneration	
							Linked to performance	Linked to service length
Koji Kakigi	Director	JFE Holdings	177,827	177,827	120,047	30,940	17,080	9,760
Yoshihisa Kitano	Director	JFE Holdings	172,303	12,000	12,000	—	—	—
	Director	JFE Steel		160,303	107,043	26,420	17,080	9,760
Toshinori Kobayashi	Director	JFE Holdings	113,050	8,400	8,400	—	—	—
	Director	JFE Shoji		104,650	55,800	35,430	8,540	4,880

Ratio of remuneration for each		
Basic remuneration: fixed (%)	Annual bonus: linked to short-term performance (%)	Stock remuneration: linked to medium- to long-term performance (%)
60	20	20

Note: The ratios above are applicable only when the company's president has attained the performance target goals.

■ Internal Control System

As of April 1, 2023

Internal control system			
Items		Number of companies (companies)	Number of people assigned (members)
Internal audit	Internal audit organization	60	172
Audit & Supervisory Board	Full-time Audit & Supervisory Board Members	29	34
	Dispatched Audit & Supervisory Board Members (part-time Audit & Supervisory Board member)	24	7
Cooperation of Audit & Supervisory Board members			
Items		Number of meeting held during FY2022	
Accounting auditor		9	
Internal Audit Department		8	

Compliance (including Anti-corruption)

■ Whistleblowing

Items	Scope	Unit	FY2020	FY2021	FY2022
Cases handled by the Corporate Ethics Hotline	JFE Holdings and operating companies	Cases	87	133	127

Independent Assurance Statement

Sustainability Accounting Co.,Ltd.

Independent Assurance Statement

October 26, 2023

Mr. Koji Kakigi
Representative Director, President and CEO of JFE Holdings, Inc.

1. Purpose

We, Sustainability Accounting Co., Ltd., have been engaged by JFE Holdings, Inc., ("the Company") to provide limited assurance on Company's following data during the fiscal year 2022, that were 49.0 million t-CO_2 of CO_2 emissions for Scope1, 7.1 million t-CO_2 of CO_2 emissions for Scope2 and 23.2 million t-CO_2e of CO_2 emissions for Scope3 (categories 1, 2, 3, 4, 5, 6, 7, 15), 627 PJ of energy consumption, 240 million tonnes of water accepted, 10.8 million tonnes of co-products emissions of JFE Steel Group, and 0.22 million tonnes of wastes emissions of JFE Engineering Corporation (collectively, "the Environmental performance indicators"). The purpose of this process is to express our conclusion on whether the Environmental performance indicators were calculated in accordance with the Company's standards. The Company's management is responsible for calculating the Environmental performance indicators. Our responsibility is to independently carry out a limited assurance engagement and to express our assurance conclusion.

2. Procedures Performed

We conducted our assurance engagement in accordance with International Standard on Assurance Engagement 3000 (ISAE 3000) and International Standard on Assurance Engagement 3410 (ISAE 3410). The key procedures we carried out included:

- Interviewing the Company's responsible personnel to understand the Company's standards and reviewing the Company's standards
- Performing cross-checks on a sample basis and performing a recalculation to determine whether the environmental performance indicators were calculated in accordance with the Company's standards

3. Conclusion

Based on the procedures performed, nothing has come to our attention that causes us to believe that the environmental performance indicators have not been calculated in all material respects in accordance with the Company's standards.

We have no conflict of interest relationships with the Company.

Takashi Fukushima
Representative Director
Sustainability Accounting Co., Ltd.
2-4, Kojimachi, Chiyoda-ku,
Tokyo, Japan

External ESG Evaluations

JFE Holdings is highly regarded by ESG evaluation organizations in Japan and overseas. Particularly notable, it is a constituent of all the Japanese equity ESG indexes selected by the Government Pension Investment Fund (GPIF), the world's largest pension fund.

FTSE Blossom Japan Sector Relative Index (Invested in by the GPIF)

JFE Holdings has been selected for four consecutive years as a constituent of the FTSE Blossom Japan Sector Relative Index, an investment index provided by FTSE Russell. This ESG index was adopted by the GPIF in March 2022. It refers to the ESG assessment made by FTSE Russell as a base and reflects management practices toward climate change risks and opportunities for some constituents that have high carbon intensity (GHG emissions per unit of revenue).

FTSE Blossom Japan

FTSE Blossom Japan Sector Relative Index (Invested in by the GPIF)

JFE Holdings is a constituent of the FTSE Blossom Japan Sector Relative Index, an investment index provided by FTSE Russell. It refers to the ESG assessment made by FTSE Russell as a base and reflects management practices toward climate change risks and opportunities for some constituents that have high carbon intensity (GHG emissions per unit of revenue).

FTSE Blossom Japan Sector Relative Index

MSCI Japan ESG Select Leaders Index (Invested in by the GPIF)

JFE Holdings has been selected for two consecutive years as a constituent of the MSCI Japan ESG Select Leaders Index, an investment index provided by MSCI Inc. The index is based on MSCI's ESG research, which is used by over 1,000 companies around the world. This comprehensive ESG index reflects ESG risks to the market portfolio and is comprised of constituents with relatively high ESG evaluation within the industry.

2023 CONSTITUENT MSCI JAPAN ESG SELECT LEADERS INDEX

※ THE INCLUSION OF JFE HOLDINGS, INC. IN ANY MSCI INDEX, AND THE USE OF MSCI LOGOS, TRADEMARKS, SERVICE MARKS OR INDEX NAMES HEREIN, DO NOT CONSTITUTE A SPONSORSHIP, ENDORSEMENT OR PROMOTION OF JFE HOLDINGS, INC. BY MSCI OR ANY OF ITS AFFILIATES. THE MSCI INDEXES ARE THE EXCLUSIVE PROPERTY OF MSCI. MSCI AND THE MSCI INDEX NAMES AND LOGOS ARE TRADEMARKS OR SERVICE MARKS OF MSCI OR ITS AFFILIATES.

MSCI Japan Empowering Women Index (WIN) (Invested in by the GPIF)

JFE Holdings has been selected for three consecutive years as a constituent of the MSCI Japan Empowering Women Index (WIN), an investment index provided by MSCI Inc. The index is constructed by multidimensionally calculating a gender diversity score of a constituent of the MSCI Japan IMI top 700 index and selecting companies from each industry that achieved high scores.

2023 CONSTITUENT MSCI JAPAN EMPOWERING WOMEN INDEX (WIN)

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S&P/JPX Carbon Efficient Index (Invested in by the GPIF)

JFE Holdings has been selected as a constituent of the S&P/JPX Carbon Efficient Index, jointly developed by S&P Dow Jones Indices and the Japan Exchange Group. The weighting of constituents in the index is determined by the status of corporate disclosure for environmental information and the level of carbon efficiency, or carbon emissions per unit of revenue.

Morningstar Japan ex-REIT Gender Diversity Tilt Index (Invested in by the GPIF)

JFE Holdings is a constituent of the Morningstar Japan ex-REIT Gender Diversity Tilt Index provided by Morningstar, Inc. This index is based on the data and evaluation methods of Equileap and is designed to facilitate investment prioritizing companies that have established gender diversity policies embedded in their corporate culture and companies committed to providing equal opportunities for employees regardless of gender.

FTSE4Good Index Series

JFE Holdings has been selected for four consecutive years as a constituent of the FTSE4Good Index Series, an investment index provided by FTSE Russell. This comprehensive ESG index in general applies the same ESG assessment scheme as that used for the FTSE Blossom Japan Index. Constituents have high absolute ESG ratings and are screened from major stocks around the world.

MSCI ESG Leaders Indexes

JFE Holdings has been selected as a constituent of the MSCI ESG Leaders Indexes, an investment index provided by MSCI Inc., since 2018. The index is formed of major stocks around the world with high ESG evaluations within their industry, selected based on MSCI's ESG research.

※ THE INCLUSION OF JFE HOLDINGS, INC. IN ANY MSCI INDEX, AND THE USE OF MSCI LOGOS, TRADEMARKS, SERVICE MARKS OR INDEX NAMES HEREIN, DO NOT CONSTITUTE A SPONSORSHIP, ENDORSEMENT OR PROMOTION OF JFE HOLDINGS, INC. BY MSCI OR ANY OF ITS AFFILIATES. THE MSCI INDEXES ARE THE EXCLUSIVE PROPERTY OF MSCI. MSCI AND THE MSCI INDEX NAMES AND LOGOS ARE TRADEMARKS OR SERVICE MARKS OF MSCI OR ITS AFFILIATES.

Evaluation Based on CDP 2022

Established in Britain in 2000, the Carbon Disclosure Project (CDP) is a nongovernmental organization that conducts ESG evaluations. It calls on companies to disclose ESG-related information by responding to CDP questionnaires to facilitate the ESG investment decisions of institutional investors. Currently, the CDP covers three environmental areas: climate change, water security, and forests, and companies are rated on an eight-point scale (from A to D-) for each area. The volume of information collected by the CDP has become one of the largest in the world, with currently over 1,101 companies in Japan responding to the questionnaires, which are widely used in various indexes by institutional investors and for socially responsible investment.

The JFE Group actively participates in CDP initiatives as a member of the CDP Reporter Service and responds to climate change and water security questionnaires every year. Our high rating reflects our complete disclosure of appropriate information for the CDP 2022 questionnaire.

CDP 2022 score: climate change: A–, water security: A–, supplier engagement: A–

White 500 Organization under the 2023 Certified Health and Productivity Management Outstanding Organizations Recognition Program

JFE Engineering was recognized as a White 500 organization, one of the top 500 companies selected under the 2023 Certified Health and Productivity Management Outstanding Organizations Recognition Program. Sponsored by Japan's Ministry of Economy, Trade and Industry and Nippon Kenko Kaigi, the program recognizes organizations that practice excellent health management, including large enterprises and small and medium-sized companies.

The company implements effective, ongoing efforts to improve employee lifestyle habits, such as instilling exercise routines, alleviating sleep-deprivation risks, and reducing smoking rates, based on an analysis of employee health risks. Furthermore, in March 2018, it established a health management system, headed by the president, as well as the JFE Engineering Health Declaration to disclose its health management initiatives internally and externally. These efforts have been highly regarded and led to this certification.

Under this program, JFE Engineering has been recognized as a White 500 company for three consecutive years and the fifth time overall, and as an Outstanding Organization for six consecutive years.

2023
健康経営優良法人
Health and productivity
ホワイト500

SOMPO Sustainability Index

JFE Holdings has been selected for 12 consecutive years as a constituent of the SOMPO Sustainability Index (former: SNAM Sustainability Index), which was launched by Sompo Asset Management Co., Ltd. The index, which comprises companies with highly regarded ESG ratings, contributes to investor asset formation by evaluating corporate value from a long-term perspective.

2023
Sompo Sustainability Index

DBJ Employees' Health Management Rated Loan Program

The DBJ Employees' Health Management Rated Loan Program is the world's first financing menu that bases loan conditions on DBJ's proprietary system for rating health management for the purpose of selecting and evaluating companies based on their performance in this area.

JFE Holdings' efforts in pursuing employee health management has been highly regarded, and it is rated as a top-ranking company under the program.

DBJ Environmentally Rated Loan Program

The Development Bank of Japan (DBJ) Environmentally Rated Loan Program uses a screening (rating) system developed by DBJ to evaluate environmental management and then assign a corresponding interest rate from three levels. This was the world's first loan program to incorporate environmental ratings in its financing menus. In March 2016, JFE Holdings was rated as a top-ranking company that pursues excellent and advanced environmental initiatives resulting in outstanding environmental-management performance, based on which the company secured a loan under the program.

JFE was rated by DBJ as a company pursuing excellent and advanced environmental initiatives in March 2016

External Evaluations of Non-ESG Areas

Noteworthy DX Companies 2023

JFE Holdings was selected as a Noteworthy DX Company 2023 for actively promoting DX under the Digital Transformation Stock Selection (DX Stock) 2023 program , jointly sponsored by Japan's Ministry of Economy, Trade and Industry, the Tokyo Stock Exchange, and the Information-technology Promotion Agency.

Over the years, the JFE Group has developed diverse businesses and now possesses a vast database of operational data that is among the best in the world. Combining this data as the source of value creation with cutting-edge AI, IoT, data science, and other technologies has enabled us to improve productivity and achieve stable production at our steelworks, biomass power generation plants, and other facilities. We have also been recognized for pursuing advanced initiatives on developing sites and human resource development systems for promoting DX.

The JFE Group positions DX as a key management strategy and will continue to provide new added value to external parties by taking on the challenges of innovating existing businesses and creating new ones, in addition to achieving groundbreaking improvements in productivity.

External Awards

Environmentally Sustainable Company, the 4th ESG Finance Awards Japan

JFE Holdings was selected as an Environmentally Sustainable Company in the 4th ESG Finance Awards Japan's Environmentally Sustainable Companies Category, presented by the Japanese Ministry of Environment. JFE Holdings has been recognized under these awards for the third consecutive year, including a special award received two years ago.

ESG Finance Awards Japan was founded to disseminate and expand ESG finance by commending institutional investors, financial institutions, intermediaries, and companies that have made an outstanding impact on the environment and society by proactively engaging in ESG finance as well as environmental and social projects. An Environmentally Sustainable Company is selected based on assessing the relative richness of disclosures regarding risks, business opportunities, and strategies, as well as governance associated with key environmental issues. The selected company must also be tackling issues through medium- to long-term strategies and have appropriate governance and management processes in place. The richness of our ESG-related information disclosure and our approach toward dialogue with stakeholders were recognized in our selection as an Environmentally Sustainable Company. We will continue to deepen our initiatives and expand our information disclosure.

Please see the following for further details.

➤ **JFE Group selected as Environmentally Sustainable Company in the 4th ESG Finance Awards Japan (Japanese only)** (https://www.jfe-holdings.co.jp/release/2023/02/230221.html)

World Steel Association 2023 Steel Sustainability Champions

JFE Steel was awarded the 2023 Steel Sustainability Champions, selected by the World Steel Association. Once a year, the association commends member companies for demonstrating leadership in developing a sustainable steel industry and society and achieving outstanding results in enhancing sustainability.

The company formulated the JFE Group Environmental Vision for 2050 in 2021 and is developing ultra-innovative technologies for reducing environmental impact. In addition, it has formulated basic policies and discloses quantitative data on sustainability in diverse areas such as the environment, human rights, and occupational health and safety. It has also identified its material issues of corporate management, set KPIs, and increased the effectiveness of its indicators by periodically reviewing the appropriateness of the issues and KPIs for evaluating initiatives. JFE Steel has proactively disseminated this information to stakeholders through the JFE Group CSR Report 2022 and by other means.

These endeavors were recognized with the Steel Sustainability Champions award for the third consecutive year. Going forward, we will further strengthen CSR management, address environmental and social issues through our business activities, and contribute to the development of a sustainable society.

Please see the following for further details.

➤ **JFE Steel Recognized as 2023 Steel Sustainability Champion** (https://www.jfe-steel.co.jp/en/release/2022/220413.html)

External Awards for Research and Development

■ Awards for Technologies and Product Developments (FY2022)

	Prize/Award	Project	Sponsor
JFE Steel	Safety and Health Excellence Recognition 2022	Horizontal development to prevent similar accidents	World Steel Association
	FY2023 The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Awards for Science and Technology (Development Category)	Development of extra-thick high strength steel plates that made possible the construction of super large container ships	Ministry of Education, Culture, Sports, Science and Technology
	FY2023 National Invention Award: Minister of Education, Culture, Sports, Science and Technology Award	Invention of ultra-high-strength thin steel sheet that improves fuel economy and collision safety of automobiles	Japan Institute of Invention and Innovation
	5th EcoPro Awards, Minister of Land, Infrastructure, Transport and Tourism Award	Public-private partnership: joint research project in developing a rich ocean—demonstrating the use of steel slag products to improve marine environment and providing environmental education	Sustainable Management Promotion Organization
	57th Machinery Promotion Award, Japan Society for the Promotion of Machine Industry Chairman's Prize	Development of an autonomous precision inspection robot	Japan Society for the Promotion of Machine Industry
	FY2022 Japan Institute of Energy Award (Technology Category)	Development of a fuel and power management guidance system for steelworks	Japan Institute of Energy
JFE Engineering	FY2022 Energy Conservation Grand Prize , Product and Business Model Category, Minister of Economy, Trade and Industry Award	Digital transformation service RODAS® for boiler power plants	Energy Conservation Center, Japan
	2022 FIDIC Contract Users' Awards Project of the Year	Renovation work for the La Mesa Water Treatment Plant 1 in the Philippines	International Federation of Consulting Engineers (FIDIC)

FY2022 Japan Institute of Energy Award
(Technology Category)

Energy Conservation Grand Prize , Minister of Economy, Trade and Industry Award

National Invention Award

5th EcoPro Awards, Minister of Land, Infrastructure, Transport and Tourism Award

57th Japan Society for the Promotion of Machine Industry President's Award
(Machine Promotion Award)

Third-party Comments

Yoshinao Kozuma

Emeritus Professor
Sophia University

1. Progress in the Transition Plan

The JFE Group has shifted its transition plan into the implementation phase and is dynamically advancing its multipronged measures for decarbonization. At the core of the transition plan is the decarbonization of its steel business, where CO_2 emissions in FY2022 decreased by 13% compared to FY2013, putting the Group on track to achieve its short-term target of reducing emissions by 18% in FY2024. JFE's medium-term target is to reduce emissions by at least 30% from FY2013 levels by FY2030, and it is making steady progress in shifting to low-carbon steelmaking processes by implementing measures such as increasing the volume of scrap used in converter furnaces while also bolstering and introducing new electric arc furnaces. The Group is also making progress in its plan to establish a supply chain that will enable overseas procurement of direct-reduced iron in collaboration with other companies. With regard to the long-term target of achieving carbon neutrality by 2050, JFE has begun construction of a test blast furnace for carbon recycling demonstrations, an ultra-innovative technology.

One particularly interesting initiative in FY2023 is JGreeX™, a green steel material that JFE began supplying in the first half of the year. This raw material has received third-party certification for CO_2 reduction and has the potential to grow into a unique brand as a product that can contribute to reducing Scope 3 emissions downstream in the value chain.

Even when all industries are included, there are not many examples of companies that are proceeding with their transition plan so quickly or comprehensively. I highly commend the JFE Group for its achievements in advanced climate management.

2. Evaluating Biodiversity Risks

On the environmental front, JFE has stepped up its biodiversity initiatives. In FY2023, it began trials on systematically evaluating biodiversity risks based on scientific evidence by applying the LEAP approach recommended by the Taskforce on Nature-related Financial Disclosures (TNFD). I look forward to the full-scale disclosure of its management of the initiative as a tool for effectively managing biodiversity risks in the supply chain.

3. Promoting Human Rights Due Diligence

On the social front, the JFE Group Human Rights Basic Policy was substantially revised in April 2023, and a human rights risk management system based on implementing human rights due diligence was established. This is another commendable achievement. Currently, the scope of identification and evaluation of human rights risks is being expanded, and a greater effort is being made to include all Group companies and suppliers within the scope of management. Continuous improvement is desired in this area so as to prevent human rights risks from becoming an obstacle to corporate growth.

4. Future Challenges

Since JFE has been falling short of meeting its KPI target on workplace accidents, there is clearly room for improvement. While I can imagine the relevant departments working strenuously each day to eliminate accidents, a fundamental review of measures may be necessary to improve the situation. In addition, the scope of aggregation has yet to be expanded for several important social indicators, including the KPI for workplace accidents, and employment of people with disabilities.

Mariko Kawaguchi

Specially appointed professor of the Graduate School of Social Design Studies, Rikkyo University

Over the past seven years, I have had the opportunity to observe the evolving process of JFE Holdings' activities as they developed. It is evident from the latest report that its initiative for decarbonization has now become a Group-wide business strategy that has also been adopted as a personal concern for employees at every business site.

First of all, it is encouraging to see the efforts being made by the Group to raise the feasibility of achieving carbon neutrality by 2050. It has created a multipronged roadmap that clearly outlines what needs to be done over the short, medium, and long term, and it has steadily put that into action. By conserving energy and developing technologies at facilities, the Group has already achieved a 13% reduction in CO_2 emissions against its short-term target of reducing emissions by 18% by FY2024. At the same time, JFE has begun work on initiatives such as shifting to electric arc furnaces, expanding the use of scrap, and improving the efficiency of electric arc furnaces. I understand that as a result, the Group is now within reach of achieving its medium-term target of reducing emissions by at least 30% by 2030. In addition, JFE also reported on concrete initiatives for achieving its goal of carbon neutrality by 2050, starting construction of a test blast furnace to demonstrate innovative technologies such as carbon recycling blast furnaces and hydrogen-based ironmaking. Furthermore, the locations of the initiatives are not limited to Japan but have expanded to overseas locations involving numerous collaborations with partners, which shows the growing scope and depth of its relationships with regions and stakeholders. It has become clear that although carbon neutrality by 2050 is still an abstract idea for most people, the JFE Group sees it as a concrete future.

I also noticed interesting ongoing initiatives in JFE's products and mechanisms. JGreeX™, which the Group began supplying in FY2023, is a green steel material that has been certified as CO_2-free by allocating the volume of CO_2 reduced by JFE based on the mass balance approach. This interesting mechanism visualizes the Group's CO_2 reductions in the form of a green product. Moreover, JFE also envisions a mechanism where this green steel is used to build vessels that transport its materials. It is a breakthrough business model that is circular and effective, in which the Group's own efforts contribute to decarbonizing its entire supply chain.

The report also introduces many eco-friendly products and projects over a remarkably wide range of fields, such as steel slag products with blue carbon credit certification for creating seaweed beds, electrical steel sheets used in energy-saving products, wind power generation, and PET recycling. Many of these are the result of JFE's own efforts as well as collaboration with a broad range of stakeholders, including companies, research institutions, NGOs, and municipalities, in Japan and overseas. The Group is adopting the outside-in approach to resolve issues in the field through partnerships called for by the SDGs. I expect that this clear decarbonization strategy and efforts for commercialization in the highly carbon-intensive steel industry will serve as the driver for decarbonizing other industries and the economy as a whole.

With regard to measures for adapting to climate change, there is growing interest in and demand for disaster prevention measures due to the increasing frequency of extreme weather events. In addition to enhancing the Group's own disaster prevention measures, society's need will continue to increase for resilient material infrastructure that is resistant to wind and flood. I look forward to the development of unique technologies and products based on ideas originating in the field.

That said, judging from the extreme weather conditions we are experiencing lately, it seems that even a 1.5°C scenario, let alone a 4.0°C scenario, would result in severe climate conditions. I hope the JFE Group will review its scenarios and consider accelerating its activities.

In the area of biodiversity, the Group is recognized as a certified enterprise under the Aichi Biodiversity Company Certification Program and many of its ecosystem preservation initiatives are underway domestically, while the opportunity and risk assessment for disclosing information recommended by the TNFD is particularly noteworthy. The general public has not yet recognized biodiversity risks, and even the steel industry views these risks as less urgent for its core business than climate change. Mining and mine development, however, have traditionally been recognized by experts as a source of ecosystem destruction and pollution as well as human rights violations. This study of risks and opportunities is a key step for integrating biodiversity into JFE's core business. I hope the Group will accelerate these efforts and demonstrate the same leadership in disclosing biodiversity information (TNFD) as it has for climate change (TCFD). In the social aspect of its activities, JFE's efforts on human rights due diligence since FY2021 are commendable, but I believe its human rights risk map merits further scrutiny given the aforementioned risks from mining. Meanwhile, it is significant that a new policy category has been titled "human capital" instead of "human resources." Human capital is a resource that will generate future returns. Consider how investments for human capital might reach beyond conventional human resource management. My suggestion to JFE is to start with formulating a medium- to long-term strategy for human capital, just as it has done with the strategic roadmap for climate change.

I have observed a steady evolution over the years in how the JFE Group incorporates sustainability into its management and business activities, leading to expanding content in both breadth and depth. I think it would be a good idea to organize the report in multiple layers by listing key points for its management strategies, long-term targets, and results for the reporting year, and to present information on products and technologies by gathering the data into categories. This might more clearly distinguish the strategy as the skeletal framework supporting the "muscles" of business practices. The public might then recognize how sustainability has indeed developed into the business "muscle" that drives corporate management. I have high expectations that this will further accelerate the initiatives of the JFE Group.

Editorial Policy

Basic Approach

This report provides stakeholders with a comprehensive account of the JFE Group's sustainability-related initiatives and data and elicits feedback toward enhancing the Company's activities and information disclosure. The 2023 report was compiled with a focus on the following.

- Progress of the Seventh Medium-term Business Plan and FY2022 KPI Results and FY2023 KPIs
- Results of initiatives aimed at addressing climate change (reduction of CO_2 emissions, contribution to reducing CO_2 in society as a whole)
- Upgraded information on the development and provision of eco-friendly processes and products
- Trial evaluation for the future disclosure of information on biodiversity preservation
- Results of activities on diversity and inclusion, and future initiatives
- Results of human rights due diligence and future initiatives
- Introduction of climate change-related metrics to executive remuneration (metrics related to the well-being and safety of employees have already been introduced in FY2022)

Scope of Report

Reporting Period

FY2022 (April 1, 2022 to March 31, 2023)
Reports on some activities undertaken before or after this period are included.

Organization Covered

The report mainly covers the activities of JFE Holdings, Inc. and its three operating companies: JFE Steel Corporation, JFE Engineering Corporation, and JFE Shoji Corporation, but also includes reports on activities of other companies in the JFE Group (414 companies, of which 326 are consolidated subsidiaries and 88 are equity-method affiliates). Quantitative information on the environment includes data from the following JFE Group operating companies.

JFE Steel Group: JFE Steel Corporation and 26 domestic and overseas consolidated subsidiaries (total: 27 companies)

21 domestic companies:
JFE Mineral & Alloy Company, Ltd., CHIBA RIVERMENT AND CEMENT CORP., MIZUSHIMA RIVERMENT CORP., JFE Precision Corporation, JFE Plastic Resource Corporation, JFE Bars & Shapes Corporation, JFE Metal Products & Engineering Inc., JFE Galvanizing & Coating Co., Ltd., JFE Container Co., Ltd., JFE Welded Pipe Manufacturing Co., Ltd., JFE Steel Pipe Co., Ltd., Galvatex Corporation, JFE Techno-wire Corporation, JFE Kozai Corporation, JFE LOGISTICS CORPORATION, JFE Chemical Corporation, JFE LIFE CORPORATION, GECOSS CORPORATION, JFE KENZAI FENCE CO., LTD., J-Logitec Co., Ltd., K-plasheet Corporation

5 overseas companies:
Nova Era Silicon S.A., JFE Steel Galvanizing (Thailand) Ltd., Thai Coated Steel Sheet Co., Ltd., Philippine Sinter Corporation, PT. JFE STEEL GALVANIZING INDONESIA

JFE Engineering Group: JFE Engineering Corporation and 15 domestic and overseas consolidated subsidiaries (total: 16 companies)

14 domestic companies:
J&T Recycling Corporation, JFE Environmental Service Corporation, NORTHERN JAPAN MACHINERY Corporation, TOHOKU DOCK TEKKO CO., LTD., JFE Aqua Machine and Service Corporation, Fujikako, Inc., Asuka Soken Co., Ltd., JFE Pipeline Engineering Corporation, JFE Technos Co., Ltd., J Farm Corporation, JFE Business Support YOKOHAMA Corporation, JFE Project One Co., Ltd., JFE Environment Technology Co., Ltd., Myoko Green Energy Co., Ltd.

1 overseas subsidiary:
J&M Steel Solutions Co., Ltd.

JFE Shoji Group: JFE Shoji Corporation and 35 domestic and overseas consolidated subsidiaries (steel-processing companies) (total: 36 companies)

19 domestic subsidiaries:
JFE Shoji Electrical Steel Co., LTD., JFE Shoji Coil Center Corporation, JFE Shoji Kohnan Steel Center Co., Ltd., JFE Shoji Tinplate Center Corporation, Aichi Kanzai Kogyo Corporation, Kyushu-Tech Corporation, JFE Shoji Kohnan Steel Center Co., Ltd., Shinnihon-kogyo Corporation, Taisei Kogyo Corporation, Toyo Kinzoku Corporation, Tochigi Shearing Corporation, Naigai Steel Corporation, Nagano Can Corporation, Niigata Steel Corporation, NIHON JISEIZAI KOGYO CO., LTD., Hokuriku Kogyo Corporation, Hokuriku Steel Co., Ltd., Mizushima Steel Corporation, Mizushima Metal Products Corporation

16 overseas subsidiaries:
Dongguan JFE Shoji Steel Products Co., Ltd., Guangzhou JFE Shoji Steel Products Co., Ltd., Zhejiang JFE Shoji Steel Products Co., Ltd., Jiangsu JFE Shoji Steel Products Co., Ltd., JFE Shoji Steel Philippines, Inc., Central Metals (Thailand) Ltd., Steel Alliance Service Center Co., Ltd., JFE Shoji Steel Vietnam Co., Ltd., JFE Shoji Steel Hai Phong Co., Ltd., JFE Shoji Steel Malaysia Sdn. Bhd., PT. JFE Shoji Steel Indonesia, JFE Shoji Steel India Private Limited, VEST Inc., JFE Shoji Steel de Mexico, S.A. de C.V., JFE Shoji Steel Service Center Bajio, S.A.P.I. de C.V., JFE Shoji Power Canada Inc.

Reference Guidelines

GRI Sustainability Reporting Standards 2016, 2018, 2019, 2020, and 2021
Ministry of the Environment (Japan): Environmental Reporting Guidelines 2018
Ministry of the Environment (Japan): Environmental Accounting Guidelines 2005
Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)

Publication Date

Website: September 2023, PDF file: September 2023
(previous report: September 2022, next report: scheduled for September 2024)

Related Reports

The following information is available at:

➤ **https://www.jfe-holdings.co.jp/en/**

Company Information

Outline of the JFE Group, corporate governance, etc.

Shareholder and Investor Information

JFE Group business information, financial data, stock and rating information, etc.

JFE Group Report (Integrated Report)

Financial information including the JFE Group's mid- to long-term business strategies, business performance, management strategies, and non-financial information, including initiatives on sustainability and corporate governance.

Guideline Content Indices

GRI Standard Content Index

The JFE Group reports information listed in this Content for GRI by referring to the GRI Standards for the period from April 1, 2022 to March 31, 2023.

Note: We refer to the JFE GROUP REPORT 2023 (Integrated Report), Securities Report from April 1, 2022 to March 31, 2023), and Corporate Governance Report published on June 27, 2023.

■ GRI 1: Foundation 2021

■ GRI 2: General Disclosures 2021

Disclosure		Pages	
		sustainability report	Other
1. The organization and its reporting practices			
2-1	Organizational details	—	➤ Overview of JFE Holdings (https://www.jfe-holdings.co.jp/en/company/info/index.html) ➤ Global Network (https://www.jfe-holdings.co.jp/en/company/g-about/global.html)
2-2	Entities included in the organization's sustainability reporting	➤ Editorial Policy (P.265)	—
2-3	Reporting period, frequency and contact point	➤ Editorial Policy (P.265) ➤ Submit Comments on the JFE Group Sustainability Report (Japanese Only) (https://frlb.f.msgs.jp/webapp/form/25459_frlb_1/index.do)	➤ Contact Us (https://www.jfe-holdings.co.jp/en/contact.html)
2-4	Restatements of information	➤ Environmental Data (P.225) ➤ Social Data (P.243)	—
2-5	External assurance	➤ Independent Assurance Statement (P.254)	—
2. Activities and workers			
2-6	Activities, value chain and other business relationships	➤ Steel Industry Initiatives (P.104) ➤ JFE Group Value Chain (P.30)	JFE GROUP REPORT (Integrated Report): P.13-14, P.23-24, P.43-46
2-7	Employees	➤ Social Data (P.243)	JFE GROUP REPORT (Integrated Report): P.107-108
2-8	Workers who are not employees	—	—
3. Governance			
2-9	Governance structure and composition	➤ Corporate Governance (P.204) ➤ Social Data (P.243)	—
2-10	Nomination and selection of the highest governance body	➤ Corporate Governance (P.204)	JFE GROUP REPORT (Integrated Report): P.77-79

Disclosure		Pages	
		sustainability report	Other
2-11	Chair of the highest governance body	—	Corporate Governance Report: P.8
2-12	Role of the highest governance body in overseeing the management of impacts	➤ System for Promoting Sustainability (P.24) ➤ Environmental Management (P.47) ➤ Human Rights (P.183) ➤ Risk Management (P.220)	Securities Report: P.23-32
2-13	Delegation of responsibility for managing impacts	➤ System for Promoting Sustainability (P.24)	—
2-14	Role of the highest governance body in sustainability reporting	➤ System for Promoting Sustainability (P.24)	—
2-15	Conflicts of interest	➤ Corporate Governance (P.204)	Corporate Governance Report: P.2
2-16	Communication of critical concerns	➤ Compliance (P.216)	—
2-17	Collective knowledge of the highest governance body	—	—
2-18	Evaluation of the performance of the highest governance body	➤ Corporate Governance (P.204)	—
2-19	Remuneration policies	➤ Corporate Governance (P.204)	JFE GROUP REPORT (Integrated Report): P.80-81
2-20	Process to determine remuneration	—	JFE GROUP REPORT (Integrated Report): P.79-81
2-21	Annual total compensation ratio	—	—
4. Strategy, policies and practices			
2-22	Statement on sustainable development strategy	➤ Message from the CEO (P.01)	JFE GROUP REPORT (Integrated Report): P.17-22
2-23	Policy commitments	➤ Human Rights (P.183)	JFE GROUP REPORT (Integrated Report): P.89-90
2-24	Embedding policy commitments	➤ Supply Chain Management (P.44) ➤ Environmental Management (P.47) ➤ Human Rights (P.183) ➤ Compliance (P.216) ➤ Corporate Governance (P.204) ➤ Risk Management (P.220)	—
2-25	Processes to remediate negative impacts	➤ Human Rights (P.183) ➤ Compliance (P.216)	—
2-26	Mechanisms for seeking advice and raising concerns	—	—
2-27	Compliance with laws and regulations	➤ Environmental Management (P.47) ➤ Compliance (P.216)	—

Disclosure		Pages	
		sustainability report	Other
2-28	Membership associations	➤ Steel Industry Initiatives (P.104)	—
5. Stakeholder engagement			
2-29	Approach to stakeholder engagement	➤ System for Promoting Sustainability (P.24)	—
2-30	Collective bargaining agreements	➤ Human Rights (P.183)	JFE GROUP REPORT (Integrated Report): P.85

■ **GRI 3: Material Topics 2021**

Disclosure		Pages	
		sustainability report	Other
2. Disclosures on material topics			
3-1	Process to determine material topics	➤ Material Issues of Corporate Management (P.16)	—
3-2	List of material topics	➤ Material Issues of Corporate Management (P.16)	—
3-3	Management of material topics	➤ Material Issues of Corporate Management (P.16) ➤ System for Promoting Sustainability (P.24) ➤ Supply Chain Management (P.44) ➤ Environmental Management (P.47) ➤ Climate Change (P.53) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91) ➤ Prevention of Pollution (P.139) ➤ Efficient Use of Resources (P.131) ➤ Water Security (P.136) ➤ Biodiversity (P.144) ➤ Responsibility to Customers (Provide Quality Products and Enhance Customer Satisfaction) (P.156) ➤ Occupational Health and Safety (P.165) ➤ Recruiting and Nurturing Diverse Human Resources (Labor Standards) (P.174)	—

■ GRI 200: Economic topics

Disclosure		Pages	
		sustainability report	Other
GRI 201: Economic Performance 2016			
201-1	Direct economic value generated and distributed	➤ Environmental Management (P.47) ➤ Community (P.192)	Securities Report: P.2-3(Transition of Key Management Indicators, etc.), P.14 (Status of Employees), P.68 (Dividend Policy), P.102 (Consolidated Income Statement)
201-2	Financial implications and other risks and opportunities due to climate change	➤ Scenario Analysis in Line with the TCFD Recommendations (P.91) ➤ Environmental Management (P.47)	—
201-3	Defined benefit plan obligations and other retirement plans	—	Securities Report: P.114 (Postemployment benefits)
201-4	Financial assistance received from government	—	—
GRI 202: Market Presence 2016			
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	—	—
202-2	Proportion of senior management hired from the local community	—	—
GRI 203: Indirect Economic Impacts 2016			
203-1	Infrastructure investments and services supported	➤ Environmental Management (P.47) ➤ Community (P.192)	—
203-2	Significant indirect economic impacts	➤ Message from the CEO (P.01) ➤ JFE Group Value Chain (P.30) ➤ Material Issues of Corporate Management (P.16) ➤ Climate Change (P.53)	—
GRI 204: Procurement Practices 2016			
204-1	Proportion of spending on local suppliers	—	—
GRI 205: Anti-corruption 2016			
205-1	Operations assessed for risks related to corruption	—	—
205-2	Communication and training about anti-corruption policies and procedures	➤ Compliance (P.216)	—
205-3	Confirmed incidents of corruption and actions taken	➤ Compliance (P.216)	—

Disclosure		Pages	
		sustainability report	Other
GRI 206: Anti-competitive Behavior 2016			
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	—	—
GRI 207: Tax 2019			
207-1	Approach to tax	➤ Tax Transparency (P.224)	—
207-2	Tax governance, control, and risk management	—	—
207-3	Stakeholder engagement and management of concerns related to tax	—	—
207-4	Country-by-country reporting	—	—

■ **GRI 300: Environmental topics**

Disclosure		Pages	
		sustainability report	Other
GRI 301: Materials2016			
301-1	Materials used by weight or volume	➤ Environmental Data (P.225)	—
301-2	Recycled input materials used	➤ Efficient Use of Resources (P.131) ➤ Environmental Data (P.225)	—
301-3	Reclaimed products and their packaging materials	➤ Efficient Use of Resources (P.131) ➤ Environmental Data (P.225)	—
GRI 302: Energy 2016			
302-1	Energy consumption within the organization	➤ Climate Change (P.53) ➤ Environmental Data (P.225)	—
302-2	Energy consumption outside of the organization	—	—
302-3	Energy intensity	➤ Climate Change (P.53) ➤ Environmental Data (P.225)	—
302-4	Reduction of energy consumption	➤ Climate Change (P.53) ➤ Environmental Data (P.225)	—
302-5	Reductions in energy requirements of products and services	➤ Steel Industry Initiatives (P.104)	—

Disclosure		Pages	
		sustainability report	Other
GRI 303: Water and Effluents 2018			
303-1	Interactions with water as a shared resource	➤ Water Security (P.136)	—
303-2	Management of water discharge-related impacts	➤ Prevention of Pollution (P.139) ➤ Environmental Data (P.225)	—
303-3	Water withdrawal	➤ Water Security (P.136) ➤ Environmental Data (P.225)	—
303-4	Water discharge	➤ Environmental Data (P.225)	—
303-5	Water consumption	➤ Water Security (P.136) ➤ Environmental Data (P.225)	—
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	—	—
304-2	Significant impacts of activities, products, and services on biodiversity	➤ Biodiversity (P.144)	—
304-3	Habitats protected or restored	➤ Biodiversity (P.144)	—
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	➤ Climate Change (P.53) ➤ Environmental Data (P.225)	—
305-2	Energy indirect (Scope 2) GHG emissions	➤ Climate Change (P.53) ➤ Environmental Data (P.225)	—
305-3	Other indirect (Scope 3) GHG emissions	➤ Climate Change (P.53) ➤ Environmental Data (P.225)	—
305-4	GHG emissions intensity	➤ Climate Change (P.53) ➤ Environmental Data (P.225)	—

Disclosure		Pages	
		sustainability report	Other
305-5	Reduction of GHG emissions	➤ Climate Change (P.53) ➤ Environmental Data (P.225)	—
305-6	Emissions of ozone-depleting substances (ODS)	—	—
305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	➤ Prevention of Pollution (P.139) ➤ Environmental Data (P.225)	—
GRI 306: Waste 2020			
306-1	Waste generation and significant waste-related impacts	➤ Environmental Data (P.225)	—
306-2	Management of significant waste-related impacts	➤ Efficient Use of Resources (P.131) ➤ Environmental Data (P.225)	—
306-3	Waste generated	➤ Efficient Use of Resources (P.131) ➤ Environmental Data (P.225)	—
306-4	Waste diverted from disposal	➤ Efficient Use of Resources (P.131) ➤ Environmental Data (P.225)	—
306-5	Waste directed to disposal	➤ Efficient Use of Resources (P.131) ➤ Environmental Data (P.225)	—
GRI 308: Supplier Environmental Assessment 2016			
308-1	New suppliers that were screened using environmental criteria	—	—
308-2	Negative environmental impacts in the supply chain and actions taken	—	—

■ GRI 400: Social topics

Disclosure		Pages	
		sustainability report	Other
GRI 401: Employment 2016			
401-1	New employee hires and employee turnover	➤ Recruiting and Nurturing Diverse Human Resources (Labor Standards) (P.174) ➤ Social Data (P.243)	—
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	—	—
401-3	Parental leave	➤ Social Data (P.243)	—
GRI 402: Labor/Management Relations 2016			
402-1	Minimum notice periods regarding operational changes	—	—
GRI 403: Occupational Health and Safety 2018			
403-1	Occupational health and safety management system	➤ Occupational Health and Safety (P.165)	—
403-2	Hazard identification, risk assessment, and incident investigation	➤ Occupational Health and Safety (P.165)	—
403-3	Occupational health services	➤ Occupational Health and Safety (P.165)	—
403-4	Worker participation, consultation, and communication on occupational health and safety	➤ Occupational Health and Safety (P.165)	—
403-5	Worker training on occupational health and safety	➤ Occupational Health and Safety (P.165)	—
403-6	Promotion of worker health	➤ Occupational Health and Safety (P.165)	—
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	➤ Occupational Health and Safety (P.165)	—
403-8	Workers covered by an occupational health and safety management system	—	—
403-9	Work-related injuries	➤ Social Data (P.243)	—
403-10	Work-related ill health	➤ Occupational Health and Safety (P.165)	—

Disclosure		Pages	
		sustainability report	Other
GRI 404: Training and Education 2016			
404-1	Average hours of training per year per employee	➤ Material Issues of Corporate Management and KPIs (P.20)	—
404-2	Programs for upgrading employee skills and transition assistance programs	➤ Occupational Health and Safety (P.165)	—
404-3	Percentage of employees receiving regular performance and career development reviews	—	—
GRI 405: Diversity and Equal Opportunity2016			
405-1	Diversity of governance bodies and employees	➤ Recruiting and Nurturing Diverse Human Resources (Labor Standards) (P.174) ➤ Social Data (P.243)	—
405-2	Ratio of basic salary and remuneration of women to men	—	—
GRI 406: Non-discrimination 2016			
406-1	Incidents of discrimination and corrective actions taken	—	—
GRI 407: Freedom of Association and Collective Bargaining 2016			
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	—	—
GRI 408: Child Labor 2016			
408-1	Operations and suppliers at significant risk for incidents of child labor	—	—
GRI 409: Forced or Compulsory Labor 2016			
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	—	—
GRI 410: Security Practices 2016			
410-1	Security personnel trained in human rights policies or procedures	—	—
GRI 411: Rights of Indigenous Peoples 2016			
411-1	Incidents of violations involving rights of indigenous peoples	—	—

Disclosure		Pages	
		sustainability report	Other
GRI 413: Local Communities 2016			
413-1	Operations with local community engagement, impact assessments, and development programs	➤ Community (P.192)	—
413-2	Operations with significant actual and potential negative impacts on local communities	Not applicable	—
GRI 414: Supplier Social Assessment 2016			
414-1	New suppliers that were screened using social criteria	—	—
414-2	Negative social impacts in the supply chain and actions taken	➤ JFE Group Value Chain (P.30)	—
GRI 415: Public Policy 2016			
415-1	Political contributions	—	—
GRI 416: Customer Health and Safety 2016			
416-1	Assessment of the health and safety impacts of product and service categories	➤ Responsibility to Customers (Provide Quality Products and Enhance Customer Satisfaction) (P.156)	—
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	—	—
GRI 417: Marketing and Labeling 2016			
417-1	Requirements for product and service information and labeling	—	—
417-2	Incidents of non-compliance concerning product and service information and labeling	Not applicable	—
417-3	Incidents of non-compliance concerning marketing communications	—	—
GRI 418: Customer Privacy 2016			
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	—	—

Comparison with Environmental Reporting Guidelines 2018 (Ministry of the Environment, Japan)

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(2) Reporting period	➤ Editorial Policy (P.265)
(3) Reporting standards and guidelines	➤ Editorial Policy (P.265) ➤ Guideline Content Indices (P.268)
(4) Overview of the environmental report	➤ Editorial Policy (P.265)
2. Trends in key performance indicators	
(1) Trends in major performance indicators	➤ Material Issues of Corporate Management (P.16)

Chapter 2: Items to Be Included in Environmental Reporting	
Items	Contents
1. Top Management Commitments	
(1) Top management commitments to the JFE Group's response to material environmental issues	➤ Message from the CEO (P.01)
2. Governance	
(1) JFE Group governance structure	➤ System for Promoting Sustainability (P.24)
(2) Manager responsible for material environmental issues	➤ Environmental Management (P.47) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
(3) Roles of the board of directors and board of executive officers in the management of material environmental issues	➤ Environmental Management (P.47) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
3. Stakeholder Engagement	
(1) Corporate policies to stakeholders	➤ Environmental Management (P.47)
(2) Overview of stakeholder engagement activities conducted in the reporting period	➤ JFE Group Value Chain (P.30) ➤ System for Promoting Sustainability (P.24) ➤ Environmental Communication (P.152)
4. Risk Management	
(1) Environment-related risk identification, assessment, and management processes	➤ System for Promoting Sustainability (P.24) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91) ➤ Human Rights (P.183) ➤ Risk Management (P.220)
(2) Positioning of the above processes in the JFE Group's overall risk management	➤ System for Promoting Sustainability (P.24) ➤ Risk Management (P.220)

Chapter 2: Items to Be Included in Environmental Reporting	
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5. Business Model	
(1) JFE Group business model	➤ JFE Group Value Chain (P.30) JFE GROUP REPORT (Integrated Report): P.13-14
6. Value Chain Management	
(1) Value chain overview	➤ JFE Group Value Chain (P.30)
(2) Green procurement policy, objectives, and results	➤ Supply Chain Management (P.44)
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7. Long-term Vision	
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(2) Time period covered by the long-term vision	➤ Message from the CEO (P.01) ➤ Climate Change (P.53) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
(3) Reasons why that time period was selected	➤ Climate Change (P.53) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
8. Strategy	
(1) JFE Group business strategy for contributing to the achievement of a sustainable society	➤ Message from the CEO (P.01) ➤ Material Issues of Corporate Management (P.16) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91) ➤ Steel Industry Initiatives (P.104)
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(1) Procedure by which the JFE Group identified its material environmental issues	➤ Material Issues of Corporate Management (P.16) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
(2) List of identified material environmental issues	➤ Material Issues of Corporate Management (P.16) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
(3) Reasons that the identified environmental issues were judged material	➤ Material Issues of Corporate Management (P.16) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
(4) Boundaries of the material environmental issues	➤ JFE Group Value Chain (P.30) ➤ Material Issues of Corporate Management (P.16) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)

Chapter 2: Items to Be Included in Environmental Reporting	
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10. JFE Group Material Environmental Issues	
(1) Policies and/or action plans	➤ Corporate Vision/Business Conduct (P.04) ➤ JFE Group Value Chain (P.30) ➤ Material Issues of Corporate Management (P.16) ➤ Climate Change (P.53) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
(2) Targets and results of policies/action plans based on performance indicators	➤ Material Issues of Corporate Management (P.16) ➤ System for Promoting Sustainability (P.24)
(3) Methodologies used for calculating each performance indicator	➤ Material Issues of Corporate Management (P.16)
(4) Aggregation scope of data for each performance indicator	➤ Material Issues of Corporate Management (P.16) ➤ Editorial Policy (P.265)
(5) Financial impact of risks and opportunities, and calculation methodologies if the financial impact is significant	➤ Environmental Management (P.47) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91) ➤ Environmental Data (P.225)
(6) Assurance report by an independent third party	➤ Independent Assurance Statement (P.254)

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(1) Scope 1 emissions	➤ Climate Change (P.53) ➤ Environmental Data (P.225)
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(3) Scope 3 emissions	➤ Climate Change (P.53) ➤ Environmental Data (P.225)
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(1) Greenhouse gas emission intensity	➤ Climate Change (P.53) ➤ Environmental Data (P.225)
Energy Usage	
(1) Breakdown of energy usage and overall energy usage	➤ Climate Change (P.53) ➤ Environmental Data (P.225)
(2) Renewable energy usage as a percentage of overall energy usage	—
2. Water Resources	
(1) Water resource inputs	➤ Water Security (P.136) ➤ Environmental Data (P.225)
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(3) Water discharge	➤ Environmental Data (P.225)

Reference: Major Environmental Issues and Their Performance Indicators	
Items	Contents
(4) Status of water stress, if the entity has sites or supply chains located in areas with water stress	➤ Water Security (P.136)
3. Biodiversity	
(1) Impact of business activities on biodiversity	➤ Biodiversity (P.144)
(2) Status and extent of the dependency of the JFE Group's business activities on biodiversity	➤ Biodiversity (P.144)
(3) Business activities that contribute to biodiversity conservation	➤ Biodiversity (P.144)
(4) Status of cooperation with external stakeholders	➤ Biodiversity (P.144)
4. Resource Circulation	
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(4) Rate of recycled and reused resources (= volume of recycled materials used/volume of resource inputs)	➤ Efficient Use of Resources (P.131) ➤ Environmental Data (P.225)
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(1) Total production of waste	➤ Efficient Use of Resources (P.131) ➤ Environmental Data (P.225)
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(1) Air-pollutant emissions volume, emission concentration in air pollution regulations	➤ Prevention of Pollution (P.139) ➤ Environmental Data (P.225)
Water pollution	
(1) Water pollution load, emission concentration in emissions regulations	➤ Prevention of Pollution (P.139) ➤ Environmental Data (P.225)
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(1) Status of soil pollution	➤ Environmental Management (P.47)

TCFD Content Index

Recommended Disclosures	Overview of TCFD Recommendations	Contents
【Governance】 Disclose the organization's governance around climaterelated risks and opportunities.	a. Describe the board's oversight of climate-related risks and opportunities	➤ Corporate Governance (P.204) ➤ Risk Management (P.220) ➤ Climate Change (Governance) (P.57)
	b. Describe management's role in assessing and managing climate-related risks and opportunities	
【Strategy】 Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning where such information is material.	a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	➤ Progress of the Seventh Medium-term Business Plan (P.12) ➤ JFE Group Value Chain (P.30) ➤ Climate Change (JFE Group Environmental Vision for 2050) (P.53) ➤ Climate Change (JFE Group's Climate Change Strategy) (P.59) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.91)
	b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	
	c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	
【Risk Management】 Disclose how the organization identifies, assesses, and manages climate-related risks.	a. Describe the organization's processes for identifying and assessing climate-related risks	➤ Risk Management (P.220) ➤ Environmental Management (P.47) ➤ Climate Change (Risk Management) (P.83)
	b. Describe the organization's processes for managing climate-related risks	
	c. Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management	
【Metrics and Targets】 Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities.	a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	➤ Progress of the Seventh Medium-term Business Plan (P.12) ➤ Material Issues of Corporate Management (P.16) ➤ Climate Change (Metrics and Targets) (P.84)
	b. Disclose Scopes 1 and 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions and related risks	➤ Climate Change (Metrics and Targets) (P.84) ➤ Environmental Data (P.225)
	c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets	➤ Material Issues of Corporate Management (P.16) ➤ Climate Change (JFE Group Environmental Vision for 2050) (P.53) ➤ Climate Change (Metrics and Targets) (P.84)