STEEL
ENGINEERING
SHOJI

JFE Group

CSR REPORT 2022

JFE

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JFE Group
CSR REPORT
2022

Message from the CEO

September 2022

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JFE Holdings, Inc.

For Earth's Prosperity, Tackling the Biggest Challenge Since Our Founding and Contributing to Development of Sustainable Society

JFE Group's Vision

It is becoming increasingly important for companies to address ESG issues as part of their management strategies in order to achieve sustainable corporate growth and enhance corporate value. The urgency of addressing climate change in particular is rapidly growing worldwide. The 2021 revision of Japan's Corporate Governance Code also requires prime market-listed companies to enhance disclosure based on the TCFD or an equivalent framework, and we expect more of these requirements in the future.

In FY2021, the JFE Group announced the Seventh Medium-term Business Plan (hereinafter "medium-term plan") and formulated the JFE Group Environmental Vision for 2050, launching a systematic approach to addressing climate change. Steel, the core business of the JFE Group, will continue to support human life and an indispensable material for social development. However, carbon dioxide (CO_2) emissions are unavoidable in the current steelmaking process producing high quality products. Therefore, it is our responsibility to solve the problem of CO_2 emissions through technological development, provide a stable supply of steel, and thus contribute to the development of a sustainable society. Through our business activities, we also hope that our corporate values will become widely acknowledged. This would motivate our employees to create even more values, which in turn would further enhance our corporate value. We will strive to be an essential part of the sustained development of society and the safe and comfortable lives of people.

Material Issues of Corporate Management, Progress on the First Year of the Medium-term Plan

In FY2021, we combined our economic issues with our material CSR issues under the policies of the medium-term plan and disclosed our material issues of corporate management. In addition to CSR initiatives that focus on environmental and social issues, we have promoted new initiatives by setting key performance indicators (KPIs) to economic issues that are essential for the Group's sustainable growth. Through the management improvements including those initiatives, both business profit and net income improved significantly in FY2021, the first year of the plan, compared to the previous year. In our mainstay steel business, our shift from quantity to quality has been progressing well as a result of DX promotion for the improved production efficiency and a prompt reflection of the cost fluctuation of raw materials in sales prices of products, in addition to our measures to increase the mix of high-value-added products and price reviewing to match product value. In the engineering business, in addition to our environment-related EPC businesses (engineering, procurement, and construction), we have been expanding the operating businesses that undertake the management and the operation of facilities after construction, helping to establish a more stable revenue base. In the trading business, demand for steel products in Japan and abroad has recovered, with business in North America doing particularly well and thereby contributing to significantly increased profit.

That said, earnings in FY2021 include one-time factors such as gains on inventory asset valuation; excluding these, per-ton-profit of-steel materials has not yet reached the target in the medium-term plan. In order to continuously grow corporate value, we must steadily implement structural reforms and significantly reduce fixed costs. We also need to strengthen our revenue base by, among other things, increasing our mix of highly value-added products and improving selling prices to match their value. We intend to make steady progress on the key measures in the medium-term plan and achieve the targets by appropriately evaluating KPI results for the key management issues and applying the PDCA cycle. These efforts will help us to increase our profitability and secure a stable source of the necessary funds, which in turn will help us to invest in and tackle medium- to long-term environmental and social issues, including climate change.

Developing New Technologies to Achieve Carbon Neutrality

A sense of urgency on climate change is spreading around the world. Since the steel business constitutes the core of the JFE Group's operations, climate change is an extremely important management issue from the perspective of business continuation. We are implementing measures announced in the JFE Group Environmental Vision for 2050, and as the result CO_2 emissions in the steel business in FY2021 were reduced by 9% compared to the level in FY2013. We are making steady progress toward achieving the target of 18% reduction by the end of FY2024.

As in this report's Special Feature, which offers the details of the vision, we announced strategies and timelines for demonstrating tests and implementing ultra-innovative technologies to achieve carbon neutrality by 2050, as well as a transition roadmap to a low-carbon iron and steelmaking process by 2030. We recognize this is an important year for deepening and expanding the roadmap we presented in 2021 and to start taking more concrete steps toward achieving our medium- and long-term goals on climate change. As of now, we do not yet have a clear solution for achieving carbon neutrality, and we are therefore leveraging NEDO's Green Innovation Funds and focusing on the development of ultra-innovative technologies such as carbon-recycling (CR) blast furnaces, which is our main focus, direct reduction ironmaking, and large electric arc furnaces. In particular, the CR blast furnace under development using our proprietary technology is based on a blast furnace method and is well suited for mass-producing high-quality, high-performance steel. It is expected to significantly contribute to decarbonization in Asia and other regions where demand for steel products is expected to increase. On the other hand, we expect more time will be required for these ultra-innovative technologies to become fully established, and they would not begin significantly contributing to reducing CO_2 emission until after 2040. Until then, we need to continue to work on other measures to steadily reduce emissions. Based on the expanded application of existing technologies and the accumulation of new reduction actions, such as the use of electric arc furnaces and increased use of steel scrap in converters, we upwardly revised our CO_2 emission reduction target for the end of FY2030 to 30% or more from FY2013 in February 2022. In order to achieve this goal, we will introduce transitional technologies such as increased use of scraps in converters and electric arc furnaces and thus promote the shift toward low-carbon iron and steelmaking process.

Carbon neutrality in the steel business is not an easy challenge. However, we consider this shift toward decarbonization as an opportunity for the company, not a crisis. The more people demand decarbonization, the more opportunities for us to apply and utilize our world-class technologies. We repeatedly communicate this to our employees involved in development, and we will take on the challenge of achieving carbon neutrality with a sense of unity so that society will come to recognize our company and our value. That said, achieving carbon neutrality requires a large amount of money for research and development and capital investment. As well as improving the profitability of our businesses, the Company is leveraging tools such as GI funds and transition bonds. Overseas, however, governments are providing huge amounts of federal R&D funding. In Japan, more support from the government and, society in general, is also needed to ensure that the technological capabilities of the Japanese steel industry, including our own, are widely utilized in society. Therefore, we will also focus on gaining the necessary understanding and support.

Initiatives for Addressing Social Issues and Enhancing Corporate Governance

We also need to focus on social issues to continuously expand our corporate value. In particular, since people are the core component of a company, we must actively focus on human capital management, which in turn depends on ensuring the safety and health of employees. The Group adheres to the philosophy of safety first, and annually invests around 10 billion yen in safety for the entire Group. In addition, in order to maintain and improve the well-being of employees and their families, we have set targets related to strengthening health guidance for employees and helping them quit smoking, and each operating company has developed its own system to promote health and productivity management. Furthermore, we are working on a range of measures from teleworking, office improvements such as free-address seating, and operational reforms including going paperless to eliminating the use of seals to ensure employees are productive and feel pride and satisfaction in their work. With regard to diversity and inclusion, we started reviewing the KPIs for females in managerial positions in FY2022. Through this and other activities, we are cultivating employees from diverse backgrounds to excel in the organization. Also in FY2022, we decided to include employee safety-related indicators in the decision-making process to determine compensation for the executive officers in addition to financial indicators. We are considering including indicators related to climate change, which is as material issue of corporate management. In order to achieve sustainable corporate growth and increase corporate value over medium- to long-term, we will continue to further enhance our corporate governance.

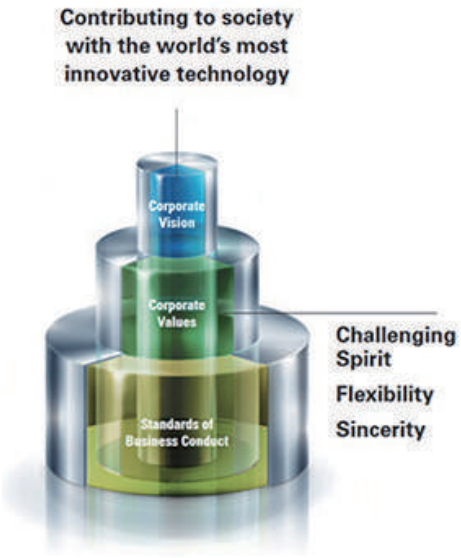
To Our Stakeholders

The JFE Group realizes corporate responsibility by understanding itself as part of society and considers corporate social responsibility (CSR) to be the foundation of its business. We will continue to ensure thorough compliance with the law and regulations, which is the foundation of a trusting relationship with society, and we will further deepen the Group's CSR activities in occupational health and safety, climate change, and in areas such as human and natural capital, which have become increasingly important in recent years. In order to pass on a prosperous planet to future generations, we have decided to take on the most significant transformation in our history. We will work to maximize synergies to continuously create new value and contribute to the development of a sustainable society by providing products and services that leverage the Group's strengths.

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 responsible for communicating these standards to employees of Group companies and their supply chain partners, and in creating effective systems and mechanisms to ensure adherence to ethical standards.

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.

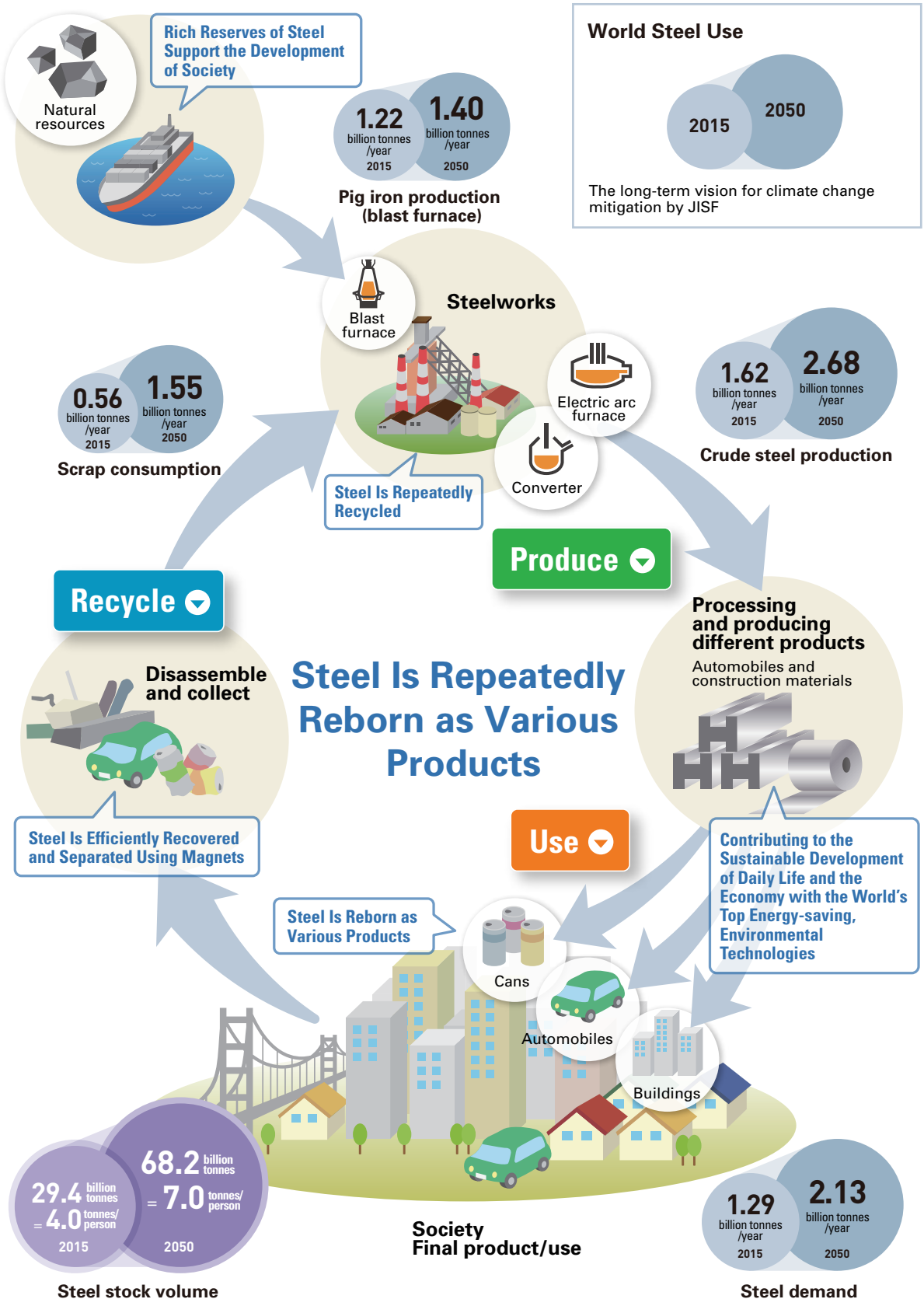
Life Cycle Assessment of Steel

Steel's excellent recyclability contributes to the creation of a sophisticated **value chain (P.29)** 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 (2018.11)
JIS Q 20915: Life cycle inventory calculation methodology for steel products (2019.6)

➤ **Contribution to the Development of Calculation in LCA** (P.99)


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

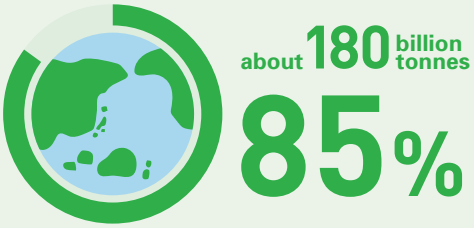
Produce High Economic Efficiency and Low Environmental Impact

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

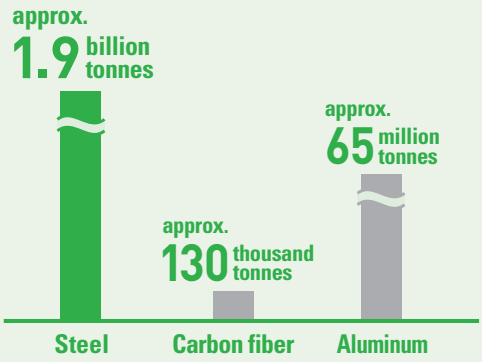


Source: Mineral Commodity Summaries (2022)

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*

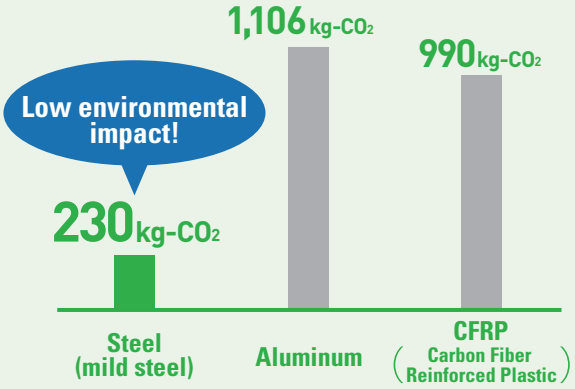
Research: JFE Holdings

*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)



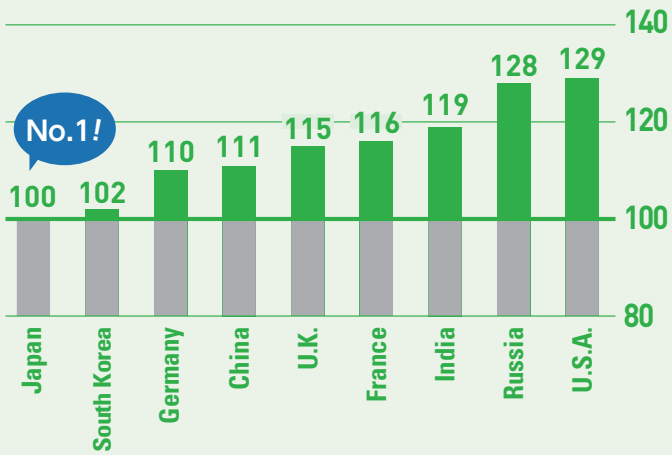
	Steel (mild steel)	Aluminum	CFRP (Carbon Fiber Reinforced Plastic)
GHG emissions per unit weight (CO_2 equivalent) (kg-CO_2/kg)	2.3	16.5	22.0
Functional equivalent weight (kg)	100	67	45

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)

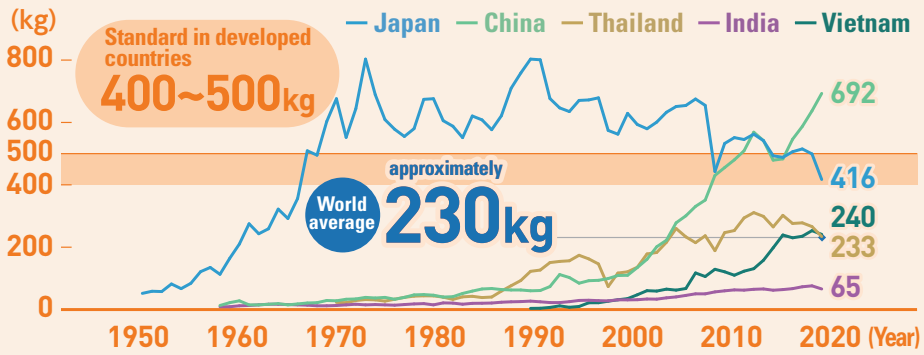
Use Foundation of Daily Life and Society

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.

The 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)

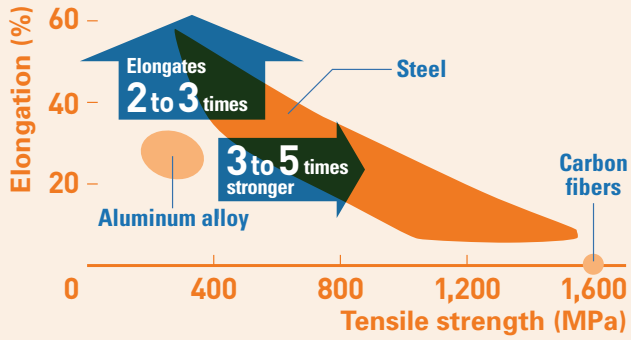


Source: World Steel Association

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

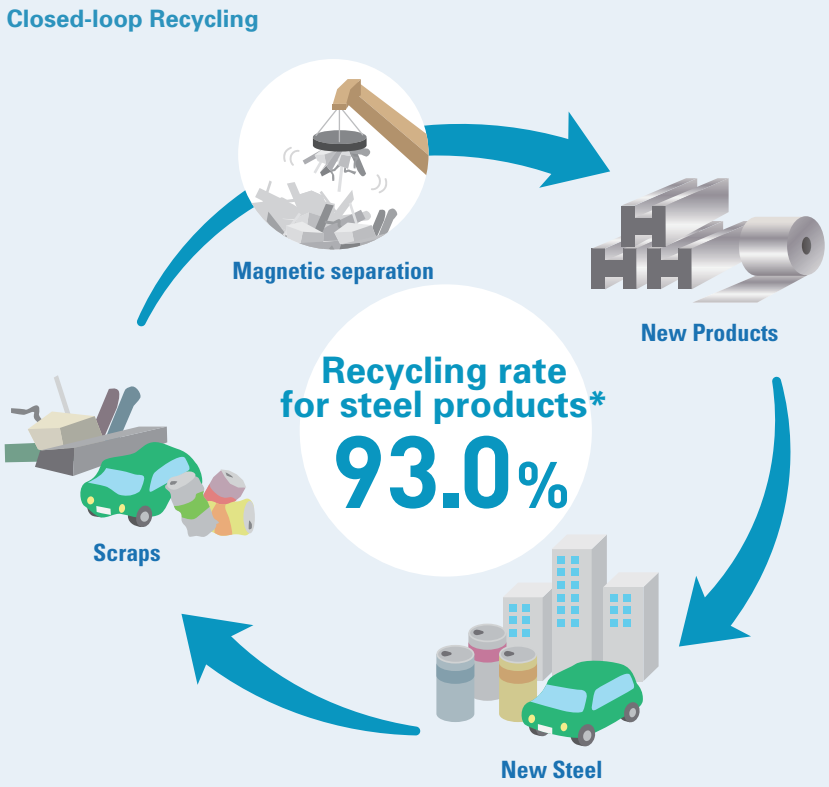
Recycle Excellent Recyclability

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 running from FY2021 through FY2024 to steadily increase corporate value over the medium- to long-term. We continue to transform ourselves, recognizing that the four years covered by the plan will be the most transformative period in the Company's history, in which we will rise to a new level by establishing the foundation for sustained, long-term growth. In FY2021, the first year of the plan, we steadily implemented the necessary measures for pursuing to ensure environmental and social sustainability and to establish economic sustainability based on stable earnings power, as outlined in the JFE Group Environmental Vision for 2050.

➤ **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

We consider addressing climate change issues as vital management concern and formulated the **JFE Group Environmental Vision for 2050** for achieving the goals set by the Japanese government in compliance with the Paris Agreement. In FY2021, we reduced CO_2 emissions in our steel business by 9% from FY2013 levels and contributed to reducing overall societal CO_2 emissions by 10.56 million t-CO_2 through our engineering business, steadily advancing toward achieving the FY2024 targets under the medium-term plan. We are pursuing a multi-track approach to achieving carbon neutrality in the steel business, with initiatives for developing ultra-innovative technologies focused on the combination of carbon recycling blast furnaces*1 and CCU*2, and hydrogen-based ironmaking (direct-reduction). To accelerate these efforts, we created a framework for swift and efficient action by establishing the Carbon Neutral Advancement Committee, which centrally deliberates and decides on key issues related to carbon neutrality, including the development of new steelmaking processes, procurement of green raw materials, and formulation of medium- and long-term targets.
We are promoting the development and utilization of transition technologies, such as the use of electric arc furnace technology and increased use of scrap in converter furnaces. In addition, in February 2022, we revised **our CO_2 emissions reduction target for FY2030, improving to 30% or more from FY2013 levels**, anticipating a further boost in research and development following the adoption of our project by the NEDO Green Innovation Fund. We also **revised our Roadmap to Carbon Neutrality*3 to include more specific examples** and are achieving solid results. We are addressing climate change by reducing CO_2 emissions in our steel business, while our engineering business is further contributing to reducing overall CO_2 emissions in society by expanding our EPC (Engineering, Procurement, Construction) and operational business for renewable energy generation facilities. Furthermore, we are working Group-wide to commercialize offshore wind power generation and have initiated capital investments in both the steel and engineering businesses, as in our decision to build Japan's first new plant for seabed-fixed structures.

Attaining sustainable growth will depend on addressing social as well as environmental issues. With regard to strengthening employee safety and health management, we are particularly focused on **eliminating major accidents** by using the latest technologies such as ICT, AI, and data science to make our facilities safer, in addition to reinforcing activities for preventing similar accidents. As planned, we are prioritizing safety investments of about 10 billion yen per year for the entire Group. In promoting employee success, we are enhancing initiatives on **diversity and inclusion** and workstyle reform to maximize the capabilities of employees with diverse backgrounds. We will particularly focus on promoting women's careers, setting a target of at least 10% female managers at the section manager level or above (including 20% in the management and sales divisions) by 2030. We have also bolstered our efforts to respect human rights in our supply chain and began conducting **human rights due diligence** in 2021. We will continue to pursue the realization of a society where human rights are respected and protected. In addition, to further enhance corporate governance, we are considering the adoption and application of non-financial indicators related to the environment and society as management targets as indicators for investment decisions, executive compensation, and other considerations. First, we will introduce indicators related to employee safety for the annual executive bonus in FY2022. We will also examine other indicators, including those related to the environment.

We will continue to forcefully promote efforts to ensure environmental and social sustainability, particularly in resolving climate change issues, and contribute to the realization of a sustainable society.

*1 Carbon-recycling blast furnaces (CR blast furnaces): Technology for converting CO_2 emitted from a blast furnace into methane, which is then blown into the blast furnace as a reductant
*2 Carbon dioxide Capture and Utilization

➤ *3 Roadmap to Carbon Neutrality (P. 68)

Establish Economic Sustainability (Stable Earnings Power)

To establish economic sustainability, we are committed to **shifting the focus of our domestic steel business from quantity to quality** while promoting our growth strategy. In FY2021, the first year of the medium-term plan, we consistently implemented our capital investment plan and blast furnace renovations in the Kurashiki district and executed major measures as planned, such as **improving the sales price** through early reflection of main raw material costs, and **cutting annual costs by 30 billion yen. With regard to structural reform, we have been consolidating our facilities as planned.** We will aim to expand our earnings power by reducing fixed costs, substantially reducing costs through such measures as digital transformation (DX), increasing the ratio of high-value-added products, and fundamentally reviewing the sales price structure. We are also holding advanced discussions for using the former Keihin site in a collaborative venture to supply hydrogen and ammonia based at the Keihin coastal area. In addition, we are further developing our strategy based on localized production by, for example, proceeding with business feasibility studies for the establishment of a production and sales joint venture with India's JSW for (grain-oriented) electromagnetic steel sheets. Furthermore, we have been executing our growth strategy by focusing on winning orders for our solutions business, which provides technology, operational, and research know-how for manufacturing high-value-added products and reducing environmental impact, and we received our first contract in maintenance technology licensing. These initiatives will establish a profit base that can stably secure 10,000 yen in per ton profit of steel materials.

Our medium-term plan positions **DX as a key for accomplishing the greatest transformation since our founding**. In FY2021, we pursued initiatives including the deployment of an anomaly detection system using data science technology for facilities in our steel business and development of an AI-based smoke detection system in our engineering business. In addition to existing internal optimization efforts such as business reforms and productivity improvement, 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. We have confidently progressed in our plan to invest a total of around 120 billion yen in DX over the four-year period, executing about 30% of this investment in FY2021. 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.

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 FY2021 was 1,849.4 billion yen, an increase of 43.3 billion yen from the previous fiscal year, largely due to an increase in working capital caused by higher prices of main raw materials and other factors. The Debt/EBITDA ratio and D/E ratio, which are the financial targets of the medium-term plan, were 2.8 times and 80.8%, respectively, representing a considerable improvement from the previous year. We will continue to secure necessary the funding by reviewing businesses and assets that contribute little to earnings to thoroughly reduce assets and by improving the cash conversion cycle (CCC) to reduce inventories. The JFE Group will complete the measures set forth in the medium-term plan to achieve sustainable growth and enhance corporate value over the medium- to long-term and overcome difficulties by quickly and accurately responding to unpredictable, rapid environments changes.

■ Performance and Profitability Targets, Dividend Policy, and FY2021 Results for the JFE Group

Performance and profitability targets	Seventh Medium-term Business Plan (final year: FY2024)	FY2021 Results
Consolidated business profit	320.0 billion yen/year	416.4 billion yen/year
Profit attributable to owners of parent	220.0 billion yen/year	288.0 billion yen/year
ROE	10%	15.7%
Debt/EBITDA	About 3 times	2.8 times
D/E ratio	About 70%	80.8%

Dividend policy	Seventh Medium-term Business Plan	FY2021 Results
Payout ratio	About 30%	28% (140 yen)

■ Performance and Profitability Targets, FY2021 Results for Operating Companies

Performance and profitability targets for operating companies		Seventh Medium-term Business Plan (final year: FY2024)	FY2021 Results
Steel business	Per ton profit	10,000 yen/tonnes	14,000 yen/tonnes (capacity: 6,000 yen/ton*1)
	Segment profit	230.0 billion yen	323.7 billion yen
Engineering business	Segment profit	35.0 billion yen	26.0 billion yen
	Sales revenue	650.0 billion yen	508.2 billion yen
Trading business	Segment profit	40.0 billion yen	55.9 billion yen

■ Investment and Asset Downsizing Plans, FY2021 Results

Content		Seventh Medium-term Business Plan (four-year total)	FY2021 Results
Investment	GX investment*2	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*3	Approx. 120.0 billion yen	Adopted slightly more than 30% of plan (system upgrades at steelworks)
Asset Downsizing		Around 200.0 billion yen	41.0 billion yen

*1 Income (loss) excluding inventory valuation difference, raw material carryover, and foreign currency translation differences.
*2 GX investment: Investments for green transformation.
*3 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 try to contribute to SDGs by our business activities and actions for material issues.

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 Respect human rights		JFE Group Suppliers Political authorities Society	Ensure adherence to corporate ethical standards and compliance Respect human rights across the supply chain	10 16

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 FY2021 KPIs and Establishment of FY2022 KPIs

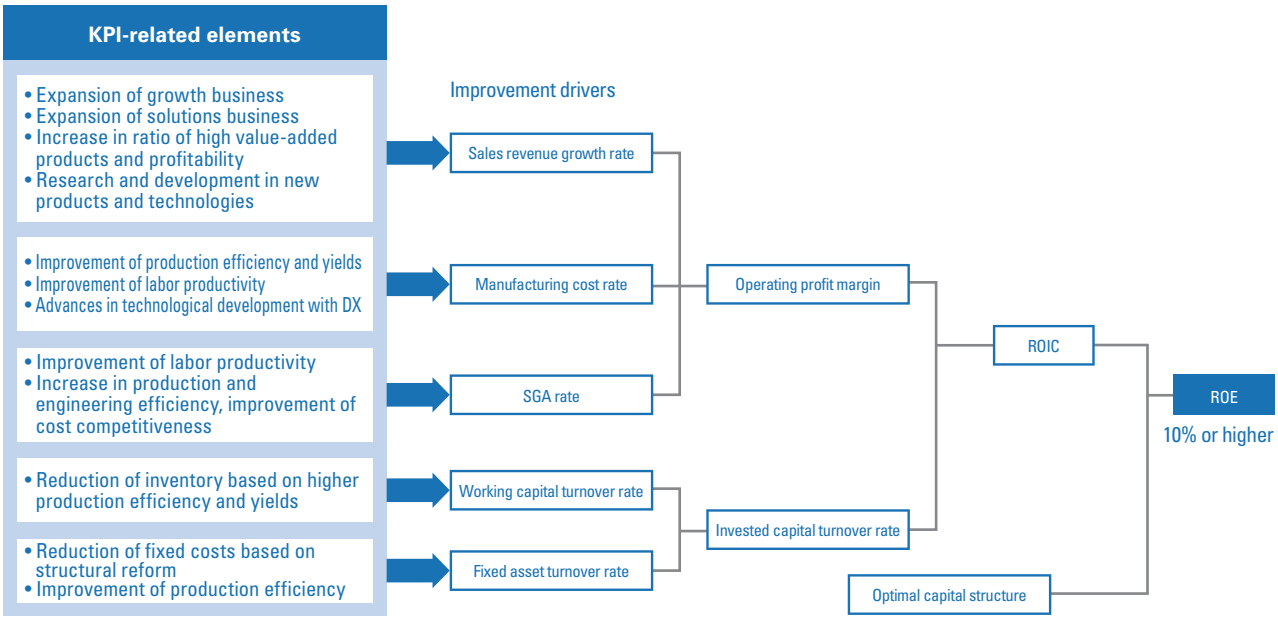
We assessed the performance of KPIs for FY2021 that were established to address material issues of corporate management identified in FY2021 and established KPIs for FY2022 based on the results of the evaluation and third-party opinions. FY2021 performance and KPIs for FY2022 were finalized following discussions by the Management Committee 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 smoothly implement the PDCA cycle to promote its initiatives.

➤ Material Issues of Corporate Management and KPIs (P.19)

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 r esults.	Working toward the goal but no results yet.

* In Groupwide evaluations, the lowest result among the companies is taken as the overall result.

Areas of Focus		Material Issues	Operating Company	FY2021 KPIs	Initiatives and Results for FY2021	Assessment	FY2022 KPIs
Activity	Contribute to resolving climate change issues (initiatives for achieving carbon neutrality by 2050)	Reduce the JFE Group's CO_2 emissions	ST	• Formulate an investment plan for CO_2 reduction using new benchmarks for steadily achieving the target of reducing CO_2 emissions by 18% from FY2013 levels by the end of FY2024 • Achieve 35% of its CO_2 reduction target by energy conservation and technological development in FY2021 • Create a structure for promoting technological development with a focus on carbon-recycling blast furnaces toward achieving carbon neutrality by 2050	• Completed formulation of the investment plan for achieving the CO_2 reduction targets for FY2024 by utilizing investment evaluation methods that incorporate contributions to CO_2 reductions in investment decisions for the first time • Despite operating equipment capable of reducing emissions equivalent to 41% of the CO_2 reduction target from energy conservation and technological development, a delay in the realization of the effects of energy conservation and technological development meant that the actual result was 25% • Created an efficient structure for promoting technological development by establishing four dedicated departments; In addition, established the Carbon Neutral Advancement Committee as a body to discuss and decide on significant issues in relation to carbon neutrality in a centralized manner	△	• 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
			EN	• Reduce CO_2 emissions in its own plants and offices FY2024: 40% reduction from FY2013 levels	• Reduced CO_2 emissions by 34% through the installation of zero-emission power generation, etc. at the Yokohama head office (FY2013: 15,600 tons / FY2021: 10,300 tons) Steadily proceeded toward achieving the target for FY2024	△	• Reduce CO_2 emissions in its own plants and offices FY2024: 40% reduction from FY2013 levels
			SH	• Reduce CO_2 emissions through the procurement of electricity derived from renewable energy Reduce domestic CO_2 emissions by at least 20% from FY2019 levels by the end of FY2024 (Reduce by 5% per year from FY2019 levels from FY2021 to FY2024)	• FY2021 CO_2 emissions of domestic operating companies: reduced by 10.7% from FY2019 levels	○	• 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)
		Contribute to reduction of CO_2 across the society	ST	• Launch sales and implement eco-friendly products and technologies*: at least 15 cases in FY2021 (the cumulative total of at least 60 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.	• FY2021: 16 cases (11 new products, 5 new technologies) (FY2021–FY2024 cumulatively: 16 cases)	○	• Launch sales and implement eco-friendly products and technologies*: at least 15 cases in FY2022 (the cumulative total of at least 60 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.
			EN	• Provide renewable energy power generation facilities • Help reduce CO_2 emissions in society by expanding the bases of the recycling business (for plastic, food, etc.) Contribute to reduction in CO_2 emissions (FY2021): 10 million tons per year	• Contributed to reduction in CO_2 emissions (FY2021): 10.56 million tons per 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 (FY2022): 11 million tons per year
			SH	1. Global resource recycling of steel scrap Promote steel scrap transactions to exceed the volume for FY2020 (FY2024 target: +5% from FY2020)	1. Despite an expansion in volume in Japan in response to an increase in demand for blast furnaces, sales volumes for overseas markets declined due to sharp fluctuations in market conditions and a surge in freight costs Fell short of target as the volume of scrap transactions was lower than FY2020 overall (–20% from FY2020)	×	1. Global resource recycling of steel scrap FY2022 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 • Expand transactions of biomass fuel (palm kernel shells and wood pellets) above FY2020 levels (FY2024 target: +100% increase from FY2020) • Diversify supply sources to ensure stable supply	2. Significantly grew transaction quantity of fuel for biomass power generation plants by communicating strategy suppliers to ensure stable supply (+33% 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% from FY2020) • Diversify supply sources to ensure stable supply

Areas of Focus		Material Issues	Operating Company	FY2021 KPIs	Initiatives and Results for FY2021	Assessment	FY2022 KPIs
Activity	Ensure occupational safety and health	Prevent workplace accidents	Group-wide	Groupwide Workplace fatalities: Zero occurrences • Lost-work injuries rate ST below 0.10 EN below 0.25 SH below 0.45	Groupwide Workplace fatalities: 2 occurrences • Lost-work injuries rate ST 0.10 EN 0.56 SH 0.60	×	Groupwide Workplace fatalities: Zero occurrences • Lost-work injuries rate ST below 0.10 EN below 0.25 SH below 0.45
			ST	[Key measures] (1) Enhance safety Install electromagnetic locks at the secondary mill entrances: 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: FY2021 target of 30% / Achieved 40% (2) ISO 45001 certification in all districts: completed certification in Chita works and Fukuyama district in FY2021		[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
			EN	[Key measures] (1) Eliminate falling accidents (100% implementation of following measures) • Pre-operation checks (curing openings in high locations and edges of work floors) • Strict adherence during operations (use of safety belts) (2) Eliminate accidents involving being caught in heavy machinery or struck by flying/falling objects (100% implementation of following measures) • Pre-operation checks (ensure on-site understanding of work plans) • Strict adherence during operations (no entry measures, allocation of worksite guides) (3) Multifaceted management of occupational safety and health using IT • Conduct remote safety patrols on premises by integrating multiple video images • Introduce an AI-based system for detecting intruders	[Key measures] (1) Focused efforts on checking equipment and preventing unsafe behavior through patrols in order to implement 100% of the measures listed on the left for eliminating falling accidents (2) Focused efforts on checking work plans and offering guidance in order to implement 100% of the measures listed on the left for eliminating accidents involving being caught in heavy machinery or struck by flying/falling objects (3) Multifaceted management of occupational safety and health using IT • Expanded areas covered by remote safety patrols on premises • Continued verification test of an AI-based system for detecting intruders		[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)
			SH	[Key measures] (1) Install safety sensors (100% of plan) (2) 100% implementation of crane operation drills (at least once a year at each company)	[Key measures] Implemented all key measures according to plan (1) Installation of safety sensors (January–December): Completed 100% of plan (2) Implementation of crane operation drills (January–December): At least once a year at each company; Implemented 100% of drills		[Key measures] (1) Installation of safety fences, covers, etc. (100% of plan) (2) 100% implementation of crane operation drills (at least once a year at each company)
		Ensure the health of employees and their families	Group-wide	1. Provision rates of healthcare guidance Groupwide 60% (2023 target)	1. Provision rates of healthcare guidance (preliminary figures) ST 54.3% EN 30.6% SH 32.1%	×	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. 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 1.5% reduction per year (total for operating companies)
	Recruit and nurture diverse human resources	Pursue diversity and inclusion	Group-wide	1. Rates for female recruits ST Career-track (white-collar position): 35% or more Career-track (technical position): 10% or more On-site position: 10% or more EN Career-track (white-collar position): 35% or more Career-track (technical position): 10% or more Production/construction position: 10% or more (four-year average) SH Career-track position: 30% or more	1. Rates for female recruits ST Career-track (white-collar position): 45% Career-track (technical position): 3% On-site position: 10% EN Career-track (white-collar position): 41% Career-track (technical position): 15% Production/construction position: 11% SH Career-track position: 37%	△	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
				2. Females in managerial positions: 5 times the 2014 August figure (FY2025 target)	2. Female in managerial positions: 4.2 times the 2014 August figure	△	2. Female in managerial positions: 10% or more in the position of 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: at least 90%	3. Rate of male employees taking childcare leave or time off related to child rearing: 89% (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	Group-wide	• 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 37.6 hours per year EN 19.2 hours per year SH 19.1 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
		Create workplaces that motivate employees	Group-wide	Groupwide Annual leave acquisition rate of at least 75% (total for operating companies)	Groupwide Annual leave acquisition rate of 78% (total for operating companies)	○	Groupwide Annual leave acquisition rate of at least 75% (total for operating companies)
			ST	• Engagement survey Affirmative response to questions about motivation: at least 75%	• Engagement survey Affirmative response to questions about motivation: 69%	△	• Engagem survey Groupwide Affirmative response to questions about motivation: at least 75% Note: Set as a Groupwide target from FY2022

Areas of Focus		Material Issues	Operating Company	FY2021 KPIs	Initiatives and Results for FY2021	Assessment	FY2022 KPIs
Activity	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	S T	1. Improve labor productivity by 20% by the end of FY2024 <FY2021 KPI> • Establish investment plans for automation, remote operation and robotics with a focus on DX • Set milestones for investment and number of personnel for each fiscal year • Plan and systemize concrete labor policies to smoothly facilitate structural reform of the Keihin district	1. Improve labor productivity • Set milestones and number of personnel for each fiscal year aimed at improving labor productivity by 20% • Established approximately 250 investment plans for automation, remote operation, and robotics during the Seventh Medium-term Business Plan Plan under revision due to issues with the feasibility of a portion of the plans in terms of investment efficiency and other variables • Labor and management reached agreement on a special system designed to achieve structural reform of the Keihin district	△	1. 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
				2. 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 0.5% in FY2021 to achieve 2% by FY2024 * Data Science	2. FY2021 Actual yields: 87.8% (+1.7% from FY2020) After taking into consideration changes in the product mix at the end of FY2024: +0.8%	○	2. 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
			E N	Increase the efficiency of engineering operations by introducing DX technologies Engineers for big data analysis utilizing Pla'cello*: 1,200 * Pla'cello: Proprietary data analysis platform using AI.	Engineers for big data analysis: About 1,500 (FY2020: about 800)	○	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.
		Raise quality of products and services and ensure reliable supply	S T	1. Make steady progress on capital investments to improve the level of quality assurance and product testing, and achieve 100% automation from test measurement to mill sheet data entry for the four priority items: tensile test, molten steel analysis, thickness measurement for hot and cold rolled steel sheets, and coating weight measurement. In addition, achieve 100% automation from test instructions, sample collation to test measurement and mill sheet data entry for automotive products.	1. Focused investments in four items (tensile test, molten steel analysis, thickness measurement for steel sheets for automobiles, and coating weight measurement) for improving the level of quality assurance and product testing, thereby achieving 100% automation from test measurement to mill sheet data entry for the four items and 100% automation from test instructions to mill sheet data entry for automotive products by the end of FY2021.	○	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
				2. Strengthen the manufacturing infrastructures using DX Aim to apply to equipment listed below in FY2021 to implement CPS* in all production processes by the end of FY2024. Kurashiki's new continuous casting DS operations, hot rolling CPS (temperature model/Kurashiki), cold rolling CPS (automatic operation/Kurashiki) and integrated quality CPS (galvanizing/Fukuyama) * CPS: Cyber-Physical System	2. Level of achievement of FY2021 plan Kurashiki's new continuous casting DS … 100% (operated J-dscom® and others) Hot rolling CPS … 90% (completed installation of warp measuring devices, warp prediction model under adjustment) Cold rolling CPS … 100% (completed development of base for automated operation) Integrated quality CPS … 100% (operated an integrated quality system)	△	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
			E N	1. Secure a stable number of certificated managing engineers	1. Amid high levels of revenue, secured a stable number of managing engineers	○	1. Secure a stable number of certificated managing engineers
				2. No major quality problems	2. No major quality problems	○	2. No major quality problems
			S H	1. Make consistent investment in processing and distribution operations	1. Carried out selective investments necessary for this fiscal year to ensure stable product supply Amount of investment (approved amount) • Reinforcement: 4.4 billion yen • Renewal and safety: 3.7 billion yen • System: 3.5 billion yen Total: 11.6 billion yen	○	1. Make consistent investment in processing and distribution operations
				2. Conduct quality audits at Group companies Continue conducting quality audits at 32 Group manufacturing affiliate companies in Japan and overseas (audit completed: 100%)	2. Conducted 32 quality audits (audit completed: 100%) Quality audits at 17 domestic Group companies (including 2 remote audits) and at 15 overseas Group companies (including 14 remote audits)	○	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%)

Areas of Focus		Material Issues	Operating Company	FY2021 KPIs	Initiatives and Results for FY2021	Assessment	FY2022 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	ST	1. Pursue strategic research and development focusing on priority development fields* Develop new products and technologies FY2021: at least 20 cases (at least 80 cases in total from FY2021 to FY2024) * Automobiles, energy, infrastructure construction materials, DX technology, and green transformation (GX) technology	1. FY2021: 21 cases (13 new products and 8 new technologies) (total from FY2021 to FY2024: 21 cases)	○	1. Pursue strategic research and development focusing on priority development fields* Develop new products and technologies FY2022: at least 20 cases (at least 80 cases in total from FY2021 to FY2024) * Automobiles, energy, infrastructure construction materials, DX technology, and green transformation (GX) technology
				2. Increase the mix of high-value-added products* to 50% in FY2024 (sell 10.9 million tons, 50% of sales excluding half-finished products, by FY2024) <FY2021 KPIs> Sales of high-value-added products: 9.3 million tons (up 1.5 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.	2. Sold of high-value-added products: 9.74 million tons	○	2. Sales of high-value-added products*:10.3 million tons (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.
				3. As a step toward triple earnings in the solution business by FY2024 from the FY2020 level, focus efforts on receiving orders for the new solutions business model (utilization of DS, provision of maintenance technologies, etc.) and secure first order. With an eye on receiving continuous orders thereafter, update external sales platform and maintenance know-how.	3. Concluded first contract in the field for provision of maintenance technologies as a result of focusing efforts on activities for receiving orders for the new solutions business model; Commercialized a solutions model that provides data science utilization technologies via the cloud and entered detailed discussions with a customer for the first project	○	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 data science 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
			EN	• Develop technologies in four priority fields of waste to resources, carbon neutrality, combined utility service and DX, and at least 60% of R&D expenses on these four fields. • Number of patent applications: at least 80 per year	• R&D expenses on these four fields: 64% • Number of patent applications: 67	△	• Develop technologies in four priority fields of waste to resources, carbon-neutrality, combined utility service, and DX, and at least 65% of R&D expenses on these four fields. • Number of patent applications: at least 80 per year
		Sales strategies for realizing sustainable growth	ST	• Expand the earnings difference between high-value-added products (A-rank products) and commodity products to 5,000 yen per tons by FY2024 <FY2021 KPI> Aim for 25% of target	• Fell slightly short of target, achieving only 20% of target for earnings difference with commodity products In FY2021, earnings for A-rank products and commodity products both improved as prices soared in overseas markets due in part to the recovery from the COVID-19 pandemic; In particular, although earnings improved markedly for commodity products such as mill scale steel, the earning difference did not reach milestone	△	• 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
			EN	Expand the stable earnings base Expand the operating businesses • Sales: 250 billion yen • Expand bases: at least 3 bases Recycling business (food, plastics, electronic appliances, etc.), regional electricity retail new power business, waste processing business, and water and sewage operations business	• Operating businesses Sales: 250 billion yen • New bases: 3 bases 1 food recycling base, 1 plastics recycling base, and 1 regional electricity retail new power business base	○	Expand the stable earnings base Expand the operating businesses • Sales: 255 billion yen • Expand bases: at least 3 bases Recycling business (food, plastics, electronic appliances, etc.), regional electricity retail new power business, waste processing business, and water and sewage operations business
			SH	• 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: at least 5 per year	• Made 5 investments per year that were necessary to acquire new functions and improve functions in existing businesses	○	• 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: at least 5 per year
Basis of activity	Thoroughly enforce compliance	Ensure adherence to corporate ethical standards and compliance	Group-wide	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 (next survey is scheduled for FY2022)	2. Implemented initiatives addressing various issues from the results of the previous survey	—	2. Improve employee awareness of ethics reflected in the Corporate Ethics Awareness Survey (100% attendance from the target audience)
	Respect human rights	Respect human rights across the supply chain		1. 100% attendance from the target audience for human rights awareness training	1. Attendance: 100%	○	1. 100% attendance from the target audience for human rights awareness training
				2. Implement human rights due diligence	2. Implemented human rights due diligence for the Company and major Group companies	○	2. Implement human rights due diligence

CSR Structure

JFR Group CSR System

The JFE Group realizes corporate responsibility by understanding itself as part of the society and considers corporate social responsibility (CSR) to be the foundation of its business as it contributes to the realization of a better society.

Supervision over CSR Initiatives

The Group established **the JFE Group CSR Council**, 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 CSR 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 CSR 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 CSR 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.

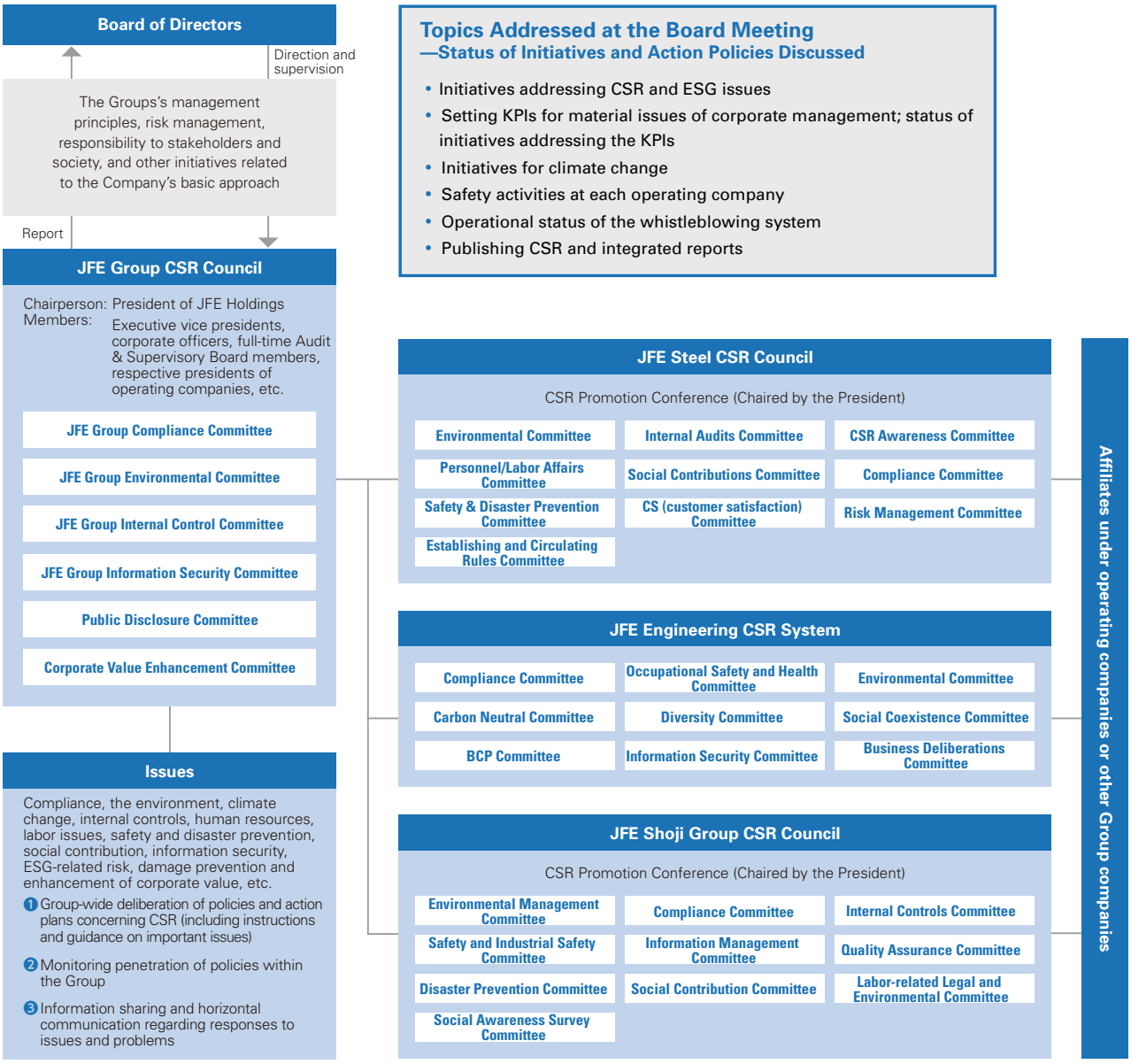
JFE Group CSR Council Activities

The Group CSR 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, which operate in collaboration with the JFE Group CSR Council to promote Group-wide CSR initiatives from the perspective of preventing damage to the JFE Group's corporate value and enhancing that value. JFE Steel established the CSR Council 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 CSR Council have been actively conducting the activities in each area, while promoting CSR awareness together with the Group companies. JFE Engineering and JFE Shoji also lead in the promotion of CSR through the establishment of committees in areas such as compliance and the environment.

■ CSR Structure Diagram



Confirmation and Improvement through the Employee Awareness Survey

The JFE Group conducts a Corporate Ethics Awareness Survey on a regular basis(once every three years) for directors and employees of the Company as well as the 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 FY2019 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 CSR Council and Board of Directors.

Moreover, we plan to conduct an awareness survey in FY2022 to determine what improvements have been made in addressing issues and changes in employee awareness, the results of which we will reflect in future initiatives.

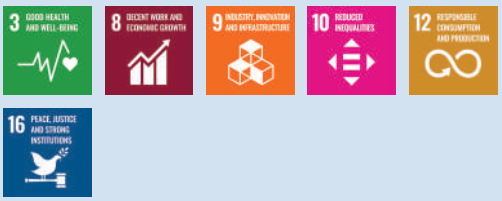
CSR Audit

To ensure that CSR activities are conducted properly, the JFE Group systematically audits environmental management, Antimonopoly Law compliance, expense management, overseas office management, tax law compliance, safety management, and disaster prevention. If an audit reveals a problem, the internal audit departments of JFE Holdings and relevant operating companies share information to support the implementation of corrective measures in their CSR activity.

Initiatives and Relevant SDGs

The JFE Group is taking action to address CSR issues, 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
CSR Management		
Supply Chain Management (P.43)	• Promoting Green Procurement • Procurement Policy and Initiatives for Each Business	
Addressing ESG Issues		
Environmental Management (P.50)	• Promotion of Environmental Management System • Environmental Education	
Climate Change (P.56)	• 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.100)	• Major Eco-friendly Products and Technologies in Each Business	
Efficient Use of Resources (P.120)	• Reducing Generation and Emission of Co-products and Re-using Co-products • Promoting Recycling • Resource Recycling Solution	
Water Security (P.125)	• Addressing Water-related Risks • Efficient Use of Water	
Prevention of Pollution (P.128)	• Controlling Air Emissions • Preventing Water Pollution • Management of Chemical Substances and Reduction of Emissions	

Activities		Related SDGs
Biodiversity (P.133)	• Biodiversity Initiatives • Commitments to External Initiatives • Products and Technologies to Preserve Biodiversity	
Environmental Communication (P.138)	• Disclosing Environmental Data for Business Sites • Disclosure and Exchange of Information	
Responsibility to Customers (Provide Quality Products and Enhance Customer Satisfaction) (P.141)	• Quality Initiatives • Improving Customer Satisfaction • Ensuring Stable Supply	
Occupational Health and Safety (P.148)	• Occupational Health and Safety • Employee Health	
Labor Standards (Recruit and Nurture Diverse Human Resources) (P.157)	• Workstyle Reform • Operational Reform • Workforce Diversity Promotion • Developing Dynamic Work Environments	
Human Rights (P.168)	• Respecting Human Rights Initiatives • Conducting Human Rights Due Diligence	
Community (P.175)	• Local activities • Support for External Organizations • Support for Youth Development • JFE 21st Century Foundation	
Shareholders and Investors (P.184)	• Proactive Information Disclosure	
Compliance (P.198)	• Adherence to Ethical Standard; Legal Compliance	
Tax Transparency (P.206)	• 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 (convocation notices, notices of resolution, etc.)	1	Approx. 150,000 shareholders
	Investors meeting (financial results, medium-term businessplan, etc.), ESG briefings	7	Approx. 1,000 persons in total
	Individual meetings with institutional investors and securities analysts	As needed	Approx. 380 persons in total
	Web-based briefings for individual investors	2	Approx. 10,000 playbacks
	Plant tours for shareholders (steel, engineering, shipbuilding bases)*1	23	Approx. 1,800 persons
	Publication of shareholder newsletters (JFE Dayori)	2 (mid-year and annual)	Approx. 280,000 copies/issues
	Various reports, including integrated reports and CSR reports*2	1	Approx. 24,000 copies
	Information via websites (for shareholders and investors), etc.	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 Figures show FY2019 results; plant tours were canceled in FY2020 due to the COVID-19 pandemic; they were held online in FY2021 (twice a year with approximately 1,400 participants).

*2 Number of issues published is for the integrated report; CSR report is only posted online.

Stakeholder	Major Communication Methods, etc.	Others	
		Frequency (per year)	Scale, etc.
Employees			
CSR initiatives are being actively pursued together with our clients, who are important business partners. We have established Purchasing and Procurement Policies to promote fair and sincere procurement activities and to construct healthy relationships with clients.	Communications through daily operations and in the workplace	As needed	
	Internal newsletters and intranet	As needed	
	Various labor-management commitees	2 to 4	Management and labor unions at each operating company
	Corporate Ethics Hotline	As needed	133 consultations in FY2021
	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	1 (every 3 years)	At the Company and operating companies
	Engagement Survey (employee satisfaction survey)*2	1 (per year)	At the Company, JFE Steel, and JFE Shoji
	Management feedback (360 degree analysis)*3	1 (per year)	At the Company 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.)	1 (per year, per region)	Approx. 270,000 persons per year
	Plant tours	As needed	More than 100,000 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	

*1 Held online in FY2020 and FY2021.
*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 FY2019 result (family days events in FY2020 and FY2021 were canceled or took place with a reduced capacity due to the COVID-19 pandemic)

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.

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. We support 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.56)

Related Pages

➤ Supply Chain Management (P.43) ➤ Development and Provision of Eco-friendly Processes and Products (P.100)
➤ Scenario Analysis in Line with the TCFD Recommendations (P.84)
➤ Steel Industry Initiatives (P.96) ➤ Environmental Data (P.207)

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.100)					
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.120) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.100) ➤ Environmental Data (P.207)					

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.125) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.100) ➤ Environmental Data (P.207)					
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.128) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.100) ➤ Environmental Data (P.207)					

Social

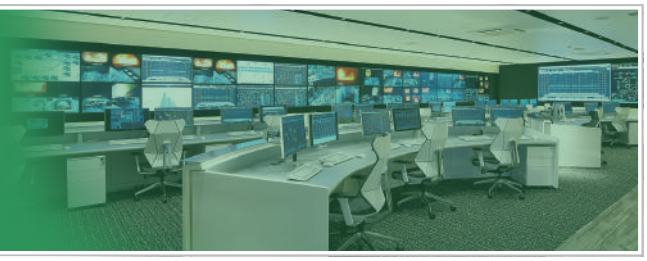
Challenges in the Value Chain	Procurement		Manufacturing, Production, and Shipping	Sales and Usage	Collecting Steel Scrap
	Raw Material Iron Ore/Coal	Machinery			
Responsibility to Customers					
The JFE Group provides steel products used in diverse areas that are indispensable to daily life, such as 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 CSR procurement and development of structure for stable procurement - Ensure competitiveness through stable production and stable quality	●	●	●	●	●
Risks - Disruptions to the supply chain caused by climate change-related disasters, natural disasters such as earthquakes, and COVID-19 - 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.141) **Related Pages** ➤ Supply Chain Management (P.43) ➤ Social Data (P.225)					
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.148) **Related Pages** ➤ Supply Chain Management (P.43) ➤ Social 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			
Labor Standards					
The JFE Group creates satisfying workplace environments and systems that incorporate diverse workstyles and enable employees with different backgrounds to fully demonstrate their abilities. We do this not only to comply with laws and regulations but also to achieve sustainable corporate growth.					
Opportunities - Secure excellent human resources through workstyle reform			●		
Risks - Labor shortage - Labor risks - Culture of passing down technical skills is dying out	●	●	●	●	●
Key Initiatives ➤ Labor Standards (Recruit and Nurture Diverse Human Resources) (P.157) **Related Pages** ➤ Social Data (P.225)					
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.43) ➤ Social Data (P.225)					

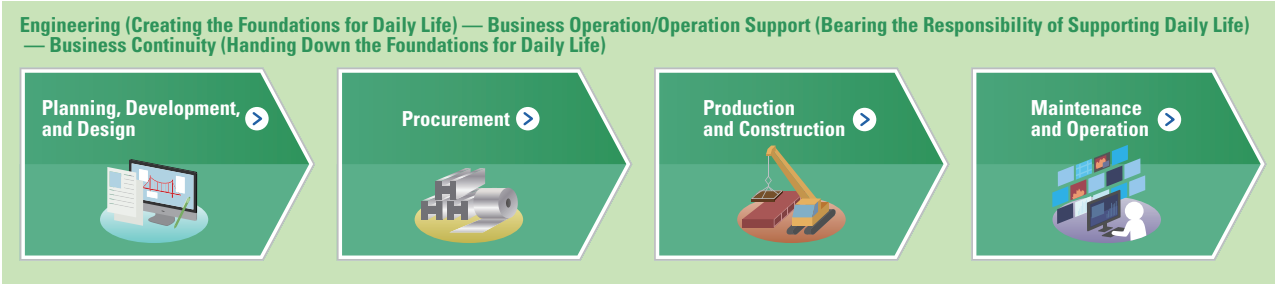
Governance

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.198) **Related Pages** ➤ Supply Chain Management (P.43) ➤ Governance Data (P.231)					
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.202) **Related Pages** ➤ Governance Data (P.231) ➤ 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/CCS 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.56) **Related Pages** ➤ Supply Chain Management (P.43) ➤ Development and Provision of Eco-friendly Processes and Products (P.100) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.84) ➤ Environmental Data (P.207)				
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.100)				

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.120) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.100) ➤ Environmental Data (P.207)				
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.125) **Related Pages** ➤ Development and Provision of Eco-friendly Processes and Products (P.100) ➤ Environmental Data (P.207)				

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.128)

Related Pages

➤ Development and Provision of Eco-friendly Processes and Products (P.100) ➤ Environmental Data (P.207)

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 CSR procurement and development of 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.141) **Related Pages** ➤ Social Data (P.225)				
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.148) **Related Pages** ➤ Supply Chain Management (P.43) ➤ Social Data (P.225)				

Challenges in the Value Chain	Planning, Development, and Design	Procurement	Production and Construction	Maintenance and Operations
Labor Standards				
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 - 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 ➤ Labor Standards (Recruit and Nurture Diverse Human Resources) (P.157) **Related Pages** ➤ Social Data (P.225)				
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.43) ➤ Social Data (P.225)				

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.198) **Related Pages** ➤ Supply Chain Management (P.43) ➤ Governance Data (P.231)				
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.202) **Related Pages** ➤ Governance Data (P.231) ➤ 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

Basic Procurement Policy, and Requests to Suppliers to Promote CSR

JFE Steel has established the Raw Material Purchasing Policy to guide its procurement of raw materials, and it intends to develop and operate a sustainable procurement system for sourcing raw materials by paying 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.

With regard to the procurement of materials and machinery, the company upholds the following Materials & Machinery Purchasing Policy to conduct purchasing activities with fairness and sincerity and thereby continue earning supplier trust as a good business partner. JFE Steel believes that its social responsibility is to raise stakeholder satisfaction and enhance its corporate value. To that end, the company prioritizes efforts in areas such as environmental protection, safety, disaster prevention, and compliance, which are fundamental to its survival, and requests its suppliers to pursue their own CSR initiatives.

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

- **Raw Material Purchasing Policy** (https://www.jfe-steel.co.jp/en/company/purchase_policy.html)
- **Materials & Machinery Purchasing Policy** (https://www.jfe-steel.co.jp/en/company/purchase_policy.html)
- **CSR Procurement Guidelines** (https://www.jfe-steel.co.jp/en/company/purchase_policy.html)

Win-Win Relationships with Suppliers

JFE Steel establishes win-win relationships with our suppliers by leveraging their ideas for improving materials, designs, shapes, specifications and production methods. The company's value-analysis activities allow them to propose how to reduce costs, improve materials functions, and upgrade quality, safety and work efficiency. The company then strives to implement the ideas wherever possible.

JFE Engineering

Fair and Sincere Procurement

JFE Engineering, viewing its suppliers as key partners in achieving mutual growth, strives to nurture mutual trust and reinforce partnership relationships. The company seeks to engage in procurement activities with integrity by complying with guidelines on fair procurement and codes of conduct for building sound and equitable relationships with suppliers and providing training for staff who are responsible for contracts.

The company collaborates with suppliers on CSR initiatives and upholds its Purchasing and Procurement Policies as a standard for fair and transparent procurement activities.

JFE Engineering's Purchasing and Procurement Policies are summarized below.

➤ **JFE Engineering Group Procurement Policy** (https://www.jfe-eng.co.jp/en/information/procurement_policy.html)

JFE Engineering requests that suppliers implement the following measures.

Requests to Suppliers Regarding CSR Initiatives

(1)Comply with laws, regulations and social norms
(2)Implement thorough information management
(3)Provide safe and competitive products and services
(4)Observe human rights, work environments and occupational health and safety
(5)Respect the global environment
(6)Develop an organization for promoting CSR

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/)

Special Feature

Challenge to the Carbon Neutrality and its Pathway in the Steel Business

—Specific Initiatives for Reducing CO_2 in the Steelmaking Process

Publication of the Special Feature

Addressing climate change issues is a top management priority for the JFE Group, whose core business is steel. In 2021, we formulated the JFE Group Environmental Vision for 2050 and announced a roadmap for achieving carbon neutrality in our steel business. In 2022, we updated the roadmap to indicate the timing for demonstration tests and implementation of ultra-innovative technologies and to specify the details and effects of the transition to low-carbon iron and steelmaking processes that should take place by 2030, when these technologies will still be under development. We have positioned the timeframe up to 2030 as the transition period for shifting to a low-carbon manufacturing process and up to 2050 as the innovation period in which to establish and implement our ultra-innovative technologies and achieve carbon neutrality. We believe 2022 will be a key year for developing a more concrete CO_2 reduction plan and taking a major step toward achieving it.

In this special feature, I would like to explain the challenges we are taking on and the pathway for achieving process transition and developing ultra-innovative technologies, so we can accelerate our efforts by broadly sharing information on our technology development and its challenges at hand with the general public and stakeholders.

President and CEO
JFE Steel Corporation

Yoshihisa Kitano

Initiatives for Reducing CO_2 Emissions in the Steel Industry

Steel is a material subject to stable mass production, featuring superior qualities suitable for diverse applications, and excellent recyclability. It will continue to support our social infrastructure as an indispensable resource for daily life. However, since high-quality steel is currently produced by removing or reducing oxygen from iron ore in a blast furnace using coke, which is baked and hardened coal, CO_2 emissions are unavoidable. At present, CO_2 emissions from the steel industry account for 14% of Japan's total CO_2 emissions and 40% of the industrial sector's CO_2 emissions, and we are aware that addressing climate change is an extremely important management issue from the perspective of business continuation. Ahead of other domestic steelmakers, the JFE Group announced a CO_2 emissions reduction target for FY2030 in 2020 and formulated the JFE Group Environmental Vision for 2050 in 2021 to declare its goal of achieving carbon neutrality by 2050. Furthermore, in February 2022, we revised upward our CO_2 emissions reduction target for FY2030 to 30% or more from FY2013, based on the expanded application of existing technologies and the accumulation of new reduction actions.

On the other hand, there is no clear answer for how to drastically reduce CO_2 during steel production, and at this point we are unable to reduce CO_2 emissions in a linear manner toward achieving carbon neutrality by 2050. We must therefore reduce emissions by saving energy and improving the efficiency of existing blast furnace processes and by increasing the use of electric arc furnaces until around 2030. In the meantime, we will continue to develop ultra-innovative technologies for realizing carbon neutrality by 2050. We believe that the establishment and implementation of these technologies starting in the 2040s will lead to significant reductions in CO_2 emissions and emission intensity. This is also indicated in Japan's Technology Roadmap in Iron and Steel Sector , and we will proceed with development based on a plan consistent with the government's goals. Now, let me explain the details of our specific initiatives for achieving each goal for the transition period up to 2030 and innovation period toward carbon neutrality by 2050.

Transition to Low-carbon Steelmaking Processes to Achieve the 2030 Target

We have a long road ahead of us to realizing carbon neutrality by 2050, and the challenge of developing ultra-innovative technologies has only just begun. To achieve our target of reducing CO_2 emissions by 30% or more by 2030, we must steadily reduce emissions without relying on these technologies since they will still be under development around that time. To do so, we will promote the transition to low-carbon steelmaking processes by upgrading to high-efficiency coke furnaces and thoroughly improving energy conservation and the efficiency of existing processes by utilizing AI and data science as well as low-carbon fuels and introducing low-carbon processes.

Expanding the use of steel scrap is one immediate way to lower the carbon footprint of the steelmaking process. JFE Steel has been expanding the use of scrap in converter furnaces by introducing the eco-friendly Double-slag Refining Process (DRP®), which can maximize the use of silicon in the molten metal as a heat source. Capital investment was completed for all districts in FY2021, and we have been sequentially rolling out the process. As of FY2021, we have confirmed CO_2 reductions of approximately 170,000 tonnes per year and will continue to make improvements. To further expand the use of scrap, we will promote the development of technologies such as burner lances to increase the heat margin of molten metal and invest in facility enhancements for reducing CO_2 emissions by approximately 2 million tonnes per year in FY2030.

We will also expand the use of scrap in electric arc furnaces. We have already announced that we will reinforce the electric arc furnace at the Sendai Works, and we plan to increase the manufacturing capacity of electric arc furnaces by about 140,000 tonnes per year by boosting capacity and enhancing cargo handling facilities through DX and other means, thereby reducing CO_2 emissions by about 100,000 tonnes per year by FY2024. In addition, we are considering suspending the operation of one blast furnace in the Kurashiki district, which is due for renovation between 2027 and 2030, and introducing large, high-efficiency electric arc furnaces. By developing technology using a small test electric arc furnace (10 tonnes) to be installed in the Chiba district under a project adopted by the NEDO Green Innovation Fund (GI Fund) at the end of last year, and by introducing our proprietary electric arc furnace technology, we hope to achieve both high-efficiency manufacturing and high-quality steel production while reducing CO_2 emissions by approximately 3 million tonnes per year.

The commercialization of ferro coke, which is currently undergoing experimental runs at a midsize facility in the Fukuyama district, and the expanded application of high-grade direct-reduced iron (HBI: hot briquetted iron), which is underway in all districts, are technological initiatives that will also play an important role in reducing CO_2 emissions during the transition period. In particular, the use of direct-reduced iron is effective for manufacturing high-quality steel products in electric arc furnaces and reducing CO_2 emissions from blast furnaces. We have agreed with Emirates Steel Arkan (UAE) and ITOCHU Corporation to conduct a detailed feasibility study for the establishment of a low-carbon reduced-iron supply chain for the green transition to produce direct-reduced iron under a jointly established venture company.

We will promote CO_2 reduction by transitioning to low-carbon steel processes up to 2030, which is expected to cost around 1 trillion yen in capital investment for establishing these processes. To obtain the monetary resources to develop and implement decarbonization technologies, we believe that it is necessary to create a market for green steel products by stimulating initial demand based on an appropriate assessment of their environmental value.

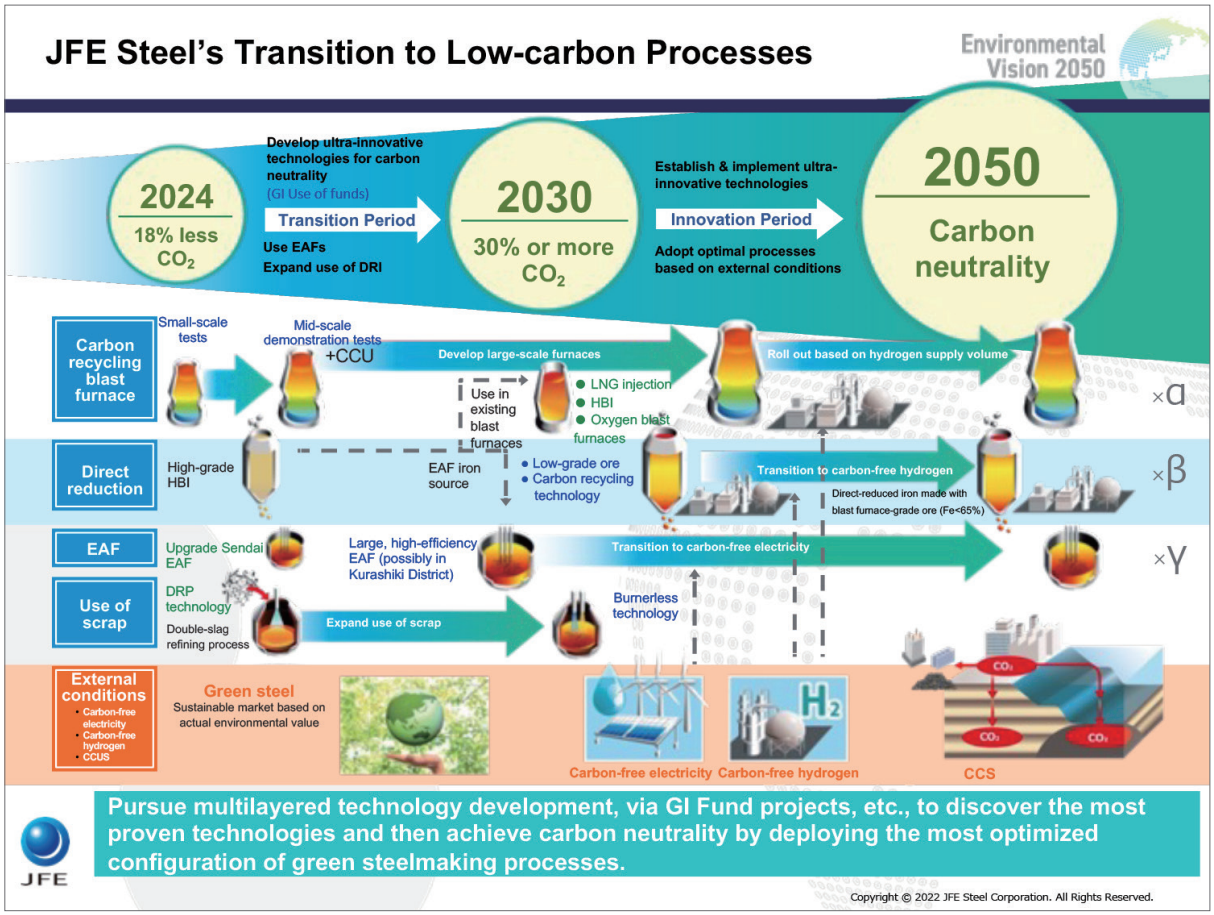
Challenge of Developing Ultra-Innovative Technologies toward Carbon Neutrality by 2050

In order to realize carbon neutrality by 2050, it is necessary to accelerate the research and development of ultra-innovative technologies to prepare for the transition to the innovation period. We are currently using the GI Fund project to simultaneously promote R&D on carbon recycling blast furnace (CR blast furnace), direct reduction, and large, high-efficiency electric arc furnace technologies. The CR blast furnace is intended to reduce CO_2 emissions by more than 50% from the current blast furnace process by recovering CO_2 generated in the furnace, converting it into methane through

methanation, and repeatedly using the methane as a reduction agent to replace part of the coke in the furnace. We have high expectations for this process as a means to take advantage of the blast furnace process to significantly reduce CO_2 emissions by utilizing existing facilities and produce high-quality steel in mass volume. We are currently constructing a 150 m^3 small test blast furnace for carbon recycling demonstrations in the Chiba district and will conduct test runs to confirm the principles of the process by FY2026. Furthermore, we plan to conduct demonstrations using a 700 m^3 midsize blast furnace in the Kurashiki district by 2030 and then verify and implement actual furnaces as soon as possible. With regard to direct reduction technology, we are developing carbon-recycling direct reduction (CR direct reduction) technology under the GI Fund project. This process uses carbon recycling technology to convert CO_2 contained in exhaust gas into methane by methanation in a reduction furnace where iron ore and pellets are reduced to produce direct-reduced iron, and the methane is used repeatedly in the reduction furnace.

In FY2024, we will begin experimenting with a small bench-test furnace to be constructed in the Chiba district, where we will seek to resolve issues such as heat absorption in hydrogen reduction, which will lead to technological validation at a larger plant and to demonstration tests or actual implementation using a full-scale furnace at an early stage. In addition, we are considering the introduction of large, high-efficiency electric arc furnaces by 2030. Using the small test electric arc furnace to be installed under the GI Fund project, we will combine preheating of reduced-iron, heating-burner and agitation technologies of molten-steel to develop a process for reducing the melting power consumption of the electric arc furnace and enabling high-speed melting of cold iron sources. We plan to incorporate these technologies into the construction of our own electric arc furnaces.

Meanwhile, building a carbon-recycling society that includes CR blast furnaces and direct reduction technology will require major infrastructure construction and enhancement to supply huge amounts of hydrogen and carbon-free electricity. We have recently established a CCUS and Green Infrastructure Study Team within the Carbon neutral advancement project team. In addition to the development of effective CO_2 utilization technologies such as methanol synthesis from CO_2, CO_2 fixation in steel slags, and reuse as roadbed materials, the new team has begun studying CO_2 capture, utilization, and storage (CCUS) technologies and the procurement of carbon-free hydrogen and electricity, including related collaboration with industrial complexes and other private companies. We will take on the challenge of developing ultra-innovative technologies while actively addressing peripheral issues that are prerequisites for realizing carbon neutrality.

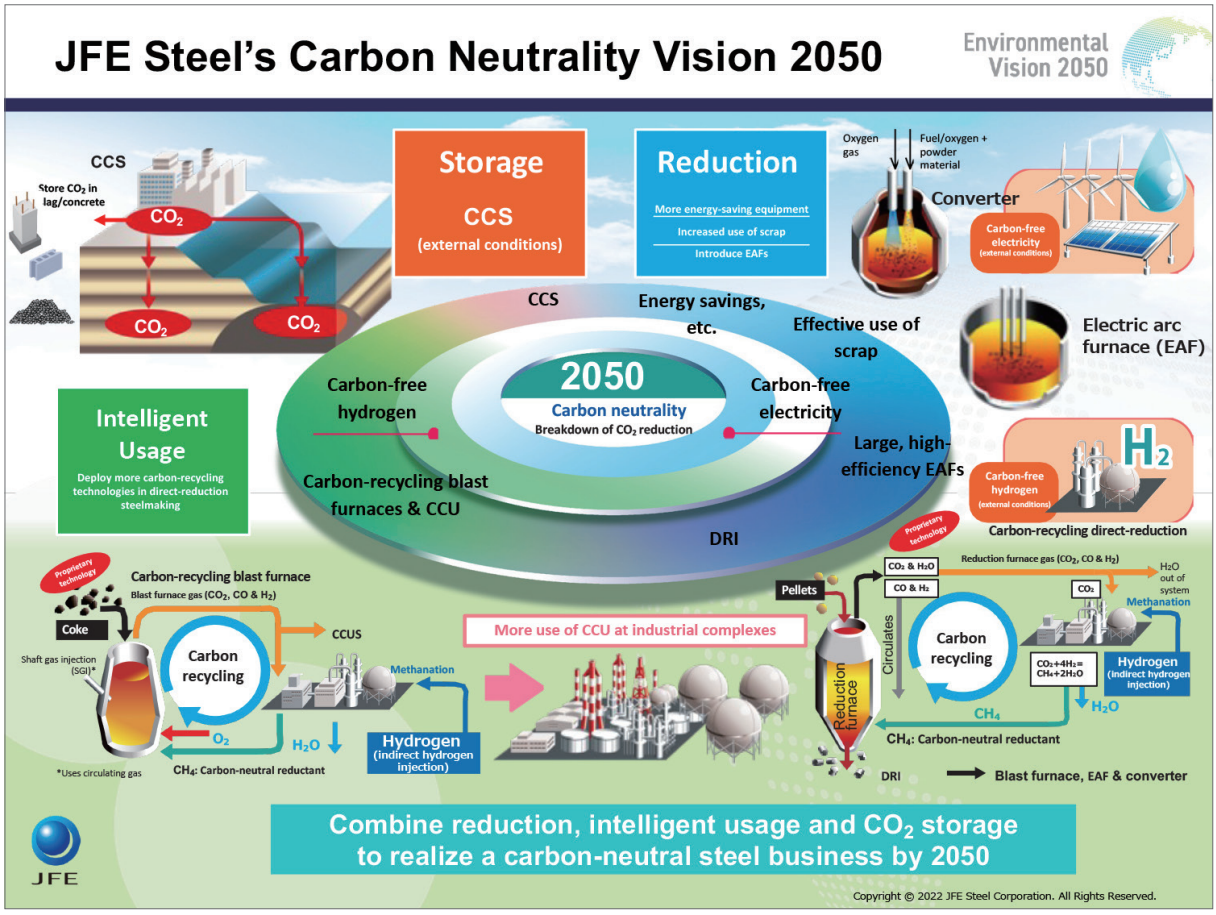


Our Mission in Steel Production

The sense of crisis over climate change is intensifying year by year, and efforts to solve the problem are accelerating around the world. As a company supplying steel, an industrial material that supports society, JFE Steel must unwaveringly contribute to realizing carbon neutrality. Although radically changing the iron and steelmaking process is no easy task, we see this as a significant opportunity for growth and will continue to take on the challenge of developing ultra-innovative technologies the world has not yet seen.

On the other hand, the development of low-carbon and ultra-innovative technologies requires huge capital investment and implementation costs, and certain increases in cost are unavoidable for creating environmental value for our products. If we adopt the mass balance approach when we achieve our CO_2 reduction target for FY2030, we will be able to supply up to 5 million tonnes of green steel per year. However, green steel products do not directly benefit consumers in terms of better quality, performance, or other aspects. Therefore, incentives are needed to encourage the purchase of these products to stimulate demand and create a market for green steel. JFE Steel has recently established a Green Steel Strategic Study Team to address this issue. In order to resolve this issue, there is a limit to the initiatives and efforts that individual companies can undertake, and it is necessary to create a system in which society as a whole will bear the cost commensurate with the environmental value and to create a market for green steel. To this end, in addition to support for research, development, and implementation of ultra-innovative technologies, we would like to ask the government for policy support for encouraging public understanding, changing the behavior of steel consumers, and raising awareness among general consumers.

The JFE Group bears responsibility as a participant in steel production, which is an indispensable material for society, and our mission is to hand down steelmaking for generations to come. With unwavering conviction, we will boldly take on the challenge of transitioning to low-carbon iron and steelmaking processes and developing ultra-innovative technologies, and we will work together with our stakeholders to achieve carbon neutrality to establish a prosperous future for the Earth.



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.

Having reflected the TCFD's philosophy in its management strategies, the JFE Group is systematically addressing climate change. 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 reduction 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% by the end of 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. The JFE Group's efforts are consistent with Japan's technology roadmap for the iron and steel sector as well as the Paris agreement.

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 intend to further expand our renewable energy power generation by leveraging the Group's collective strength and accelerating the offshore wind power generation business.

As part of our contribution to the environment through our businesses, including the reduction of our environmental impact as stated in our environmental policy, we are developing and providing environmentally sound processes and products. 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.19)

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.56) for achieving carbon neutrality
- **Development of ultra-innovative technologies** (P.56) , mainly the carbon-recycling blast furnace
- Group-wide effort to accelerate the commercialization of **the offshore wind-power generation business** (P.72)
- 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.125) in steelmaking processes (high recirculation rate)
- Improvement and assessment of the environment at and around business sites, **contribution to biodiversity** (P.133) from using steel slag products

Environmental Management

Environmental Philosophy and Strategies

The JFE Group's environmental philosophy and strategies target the development of innovative technologies and international cooperation aimed at protecting the global environment by having the intention to achieve "Accordance with Global Environment" and "Improvement of Global Environment" within the corporate activity.

Environmental Philosophy

The JFE Group puts top priority on protecting and enhancing the global environment to maintain its business in harmony with the environment, 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

Framework for Environmental Management

The JFE Group Environmental Committee, chaired by the president of JFE Holdings and operating under the JFE Group CSR Council, sets goals for environmental protection, monitors the progress of such 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 issue 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.

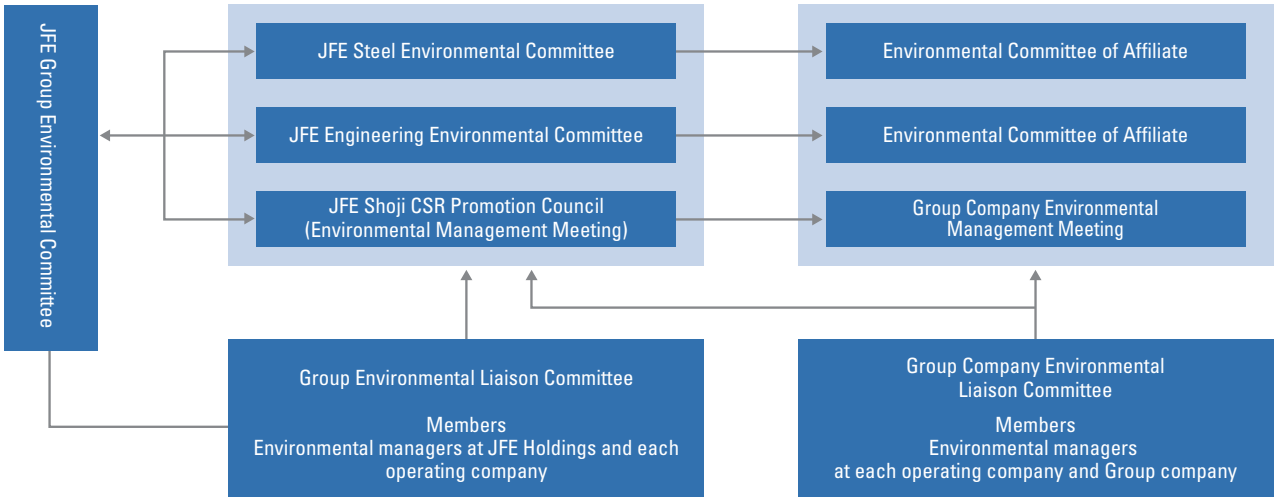
For further details, refer to:

➤ **JFE Group CSR System** (P.23)

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

➤ **JFE Group Environmental Vision for 2050** (P.56)

■ **Environmental Management System**



Environmental Management System

Acquisition of ISO 14001 certification is an important 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 received the certification, encompassing 68% of 44,461 employees at 84 companies covered in this report and 54% covered for total sites. In FY2021, the number of major violations of environmental law or regulation by Group companies that resulted in a fine was 0, and the total amount of fines and penalties was 0 yen.

JFE Steel

JFE Steel has an Environment Management Department at its head office and in each business office, and the Environmental Committee chaired by its president and the Environment Management Committee 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 at each of the 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 FY2022 are (1) promote environmental contribution through products for mitigating global warming and climate change, (2) promote effective energy conservation and resource recycling, and (3) prevent violations of the Waste Management and Public Cleansing Law and comply with the Act on Promotion of Resource Circulation for Plastics.

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.

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)

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

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.207)

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 organized by position and job.

At the Group level, we hold an annual Group-wide Review Session on Environment-Related Laws and Regulations, to which we invite lawyers specialized in environment-related laws and regulations to give lectures on the latest information on the enactment and revision of these laws, as well as associated violations and court decisions. Employees from wide-ranging departments, including the Safety and Environment, 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 and use it as the basis for planning their environment-related 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 onsite personnel.

JFE Engineering

JFE Engineering educates all employees about environmental issues to increase their understanding of the company's related policies and initiatives. To ensure proper environmental management at its production sites and construction sites, training is often tailored to the specific operations of employees, helping them to enhance their capabilities.

In FY2021, JFE Engineering worked on expanding its remote training opportunities and also on making training more practical and grounded in actual business operations.

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.207)

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 48.5 billion yen and expenses amounted to 105.6 billion yen in FY2021. Capital investment included 18.9 billion yen for measures to prevent global warming (measures to address climate change), 12.4 billion yen for air pollution countermeasures, and 7.2 billion yen for water pollution prevention. Environmental capital investment as a percentage of overall capital investment was roughly 23%.

Environmental expenses for environmental activities included 31.4 billion yen for air pollution countermeasures, 27.0 billion yen for global warming countermeasures (measures to address climate change) and 17.4 billion yen for industrial water recycling. Environmental R&D expenses came to 9.3 billion yen.

Capital Investment

To save energy and reduce environmental impacts stemming from production, the JFE Group invests in environmental technologies for plants and equipment. Cumulative investment in energy savings, totaling 556.4 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 770.9 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 FY2022 is about 1.3 billion yen.

■ Breakdown of Environmental Costs

Main Items		FY2021	
		Investment (billion yen)	Cost (billion yen)
Management	Impact monitoring and measurement, and EMS expenses and education	1.4	2.5
Global warming countermeasures	Saving and efficiently using energy	18.9	27.0
Conservation of natural resources	Recycling industrial water	6.6	17.4
	Recycling and waste management of internally generated materials, etc.	1.2	5.9
Environmental protection	Air pollution countermeasures	12.4	31.4
	Water pollution countermeasures	7.2	9.6
	Prevention of soil contamination, noise, vibration, and sub-sidence	0	0.5
Other	Charges, etc.	—	1.4
R&D	Technologies for protecting the environment, saving energy, and preventing global warming	0.8	9.3
Societal activities	Support for nature preservation and forestation, information disclosure, exhibitions, and public relations	—	0.6
Total		48.5	105.6

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.207)

Related Links

➤ **Material Flow** (P.207)
➤ **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 an extremely important 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. Applying these technologies to steel manufacturing has successfully reduced CO_2 emission intensity to the lowest level worldwide.

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 it 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 increase sustainability through solutions that address global climate change issues while restructuring its business to respond to the changes in the environment surrounding the steel business. We regard 2020 to be the landmark year to further reinforce our efforts to tackle climate change, and we are actively promoting initiatives for reducing CO_2 emissions.

In 2021, having positioned climate change as a top-priority issue in the Seventh Medium-term Business Plan, we **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 our business strategies** in the 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 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 unique techonology** 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, by supplying high-performance steel products, and through other initiatives. Furthermore, we will accelerate commercialization of **our offshore wind-power business** by applying the strengths of the Group.

JFE Group Environmental Vision for 2050

- **Climate change is an extremely important business concern for JFE, and we are aiming to achieve carbon neutral 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 our corporate value by contributing to CO_2 emissions reduction across society.**
- **The principles of TCFD will be reflected in our business strategies and deployed in a systematic manner.**

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-grade 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.

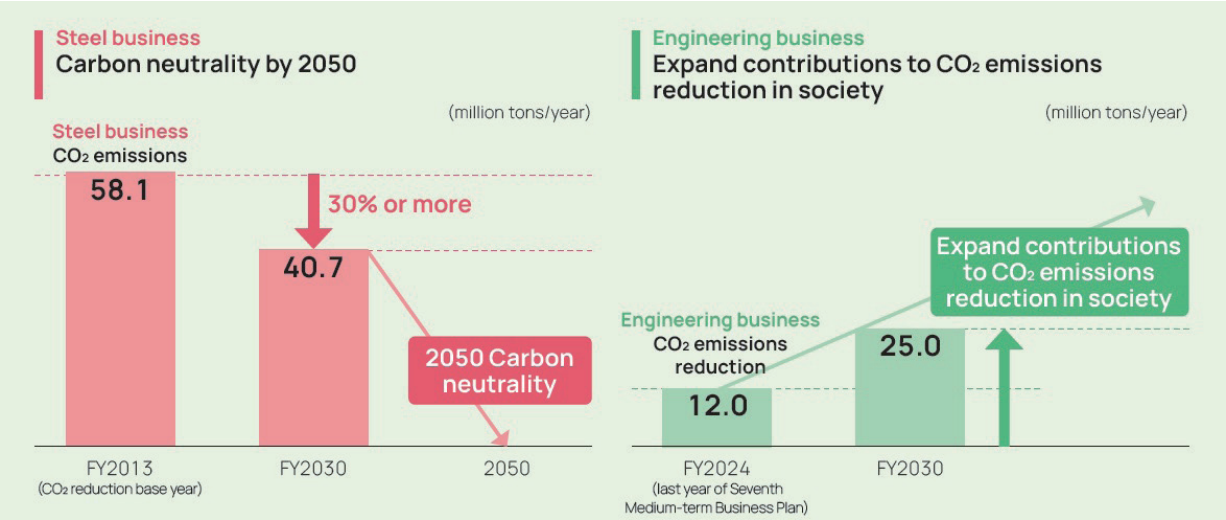
1. Carbon-recycling blast furnace: A technology that converts CO_2 from the blast furnace into methane and repeatedly uses it as reducing material in the blast furnace
2. CCU: Carbon dioxide capture and utilization
3. Transitional technologies: Technologies that advance the transition to carbon neutrality
4. 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-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 aims to establish the necessary decarbonization technologies as soon as possible, ahead of global competitors, assuming that we have the decarbonization infrastructure in place and ability to compete on an equal footing globally.

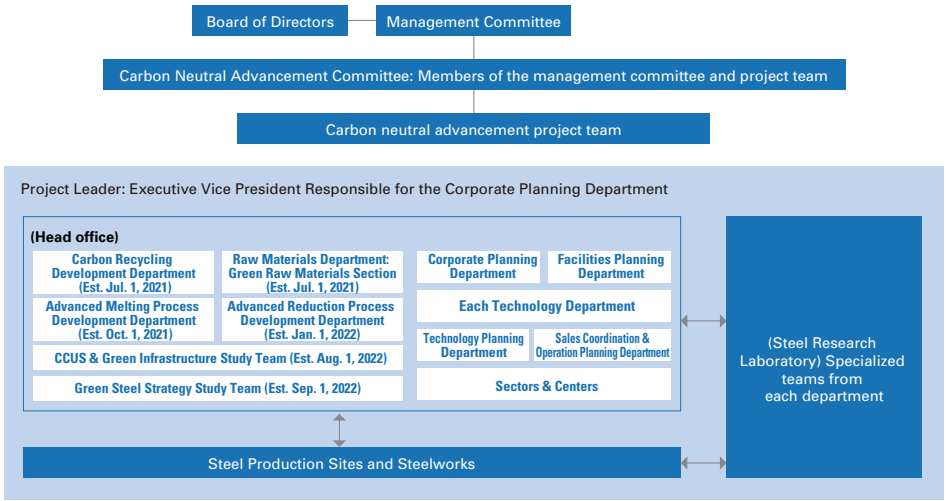
■ JFE Group's Activities for Carbon Neutrality



JFE Steel's Management Structure to Promote Carbon Neutrality

In October 2020, JFE Steel established a company-wide project team that directly reports to the president to promote the development and commercialization of ultra-innovative technologies for achieving carbon neutrality by 2050. In July 2021, the company further enhanced its management structure for promoting carbon neutrality by introducing new specialized departments. This management structure will help the company accelerate its efforts to achieve carbon neutrality.

■ 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)*.

*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.251)

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.

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 reduction targets for CO_2 emissions by the end of FY2030

➤ Corporate Governance System (P.188)
➤ Framework for Environmental Management (P.50)

Addressing Climate Change Issues

Having formulated and presented an actionable roadmap for achieving carbon neutrality by 2050, this is the year for taking concrete steps toward developing ultra-innovative technologies.

The JFE Group considers climate change as a top-priority business issue to overcome for business continuity. In 2020, we became the first steel company in Japan to disclose individual company-level CO_2 emission reduction targets for our steel business. In 2021, we formulated and presented the JFE Group Environmental Vision for 2050, which is our roadmap for achieving carbon neutrality by 2050. This marked the beginning of a new stage for us. Our CO_2 emission reduction targets are in line with the Paris Agreement. We will work toward achieving these targets while at the same time developing ultra-innovative technologies, mainly focusing on three key areas: technology combining carbon-recycling blast furnace and CCU*, hydrogen-based ironmaking (direct reduction), and high-efficiency, large electric arc furnaces.

The year 2022 is important for us to start making concrete steps toward developing ultra-innovative technologies. In the steel business, in February 2022 we upwardly revised our CO_2 emission reduction target for the end of FY2030 to 30% or more of FY2013, based on the progress made so far in transition technology development initiatives, such as the use of an electric arc furnace and increased use of scrap in converters, as well as progress in improving external surroundings. Then in May, we formulated and presented an actionable roadmap for achieving carbon neutrality together with details of the demonstration tests. The roadmap includes plans to build demonstration test facilities in the East Japan Works' Chiba District, including a small carbon-recycling test blast furnace (150 m^3), a small bench-test direct hydrogen reduction furnace, a small electric arc furnace (10 tons). We have concentrated these facilities in the same area for greater efficiency and are accelerating the development of these ultra-innovative technologies.

Another area of focus is to expand our contribution to reducing CO_2 emissions in society as a whole. We consider this as a new business opportunity for applying our advanced technologies to create a sustainable society. This will enable us to grow our businesses and enhance our corporate value. In the engineering business, we have started construction work for a Woody Biomass Combustion Power Plant in Tahara City, Aichi prefecture. The plant is to be one of the largest of its kind in Japan. We are also working to develop a fully automated operation of incinerators to increase the level of waste-derived power generation. By expanding our renewable power generation plant businesses that do not emit carbon, we will contribute to achieving carbon neutrality in society as a whole. In the steel and trading businesses as well, we are expanding our supply system for electrical steel sheets and other products, where demand is expected to rise for electric vehicles and other products. By establishing a secure global distribution infrastructure, we will capture demand across the Group, spread the use of our high-performance steel materials and, in turn, contribute to reducing CO_2 emissions in society as a whole.

Furthermore, we accelerate the commercialization of the offshore wind-power business by applying the strengths of the Group. With JFE Engineering as the main driver, we will engage manufacturing and marketing monopiles and other seabed-fixed structures. We have started constructing Japan's first monopile-foundation manufacturing plant and plan to start production in 2024. Offshore wind-power generation business can take full advantage of the capabilities of all our operating companies. We will make a Group-wide effort to accelerate this business.

In order for the JFE Group to survive amid global competition, we will work hard to stay ahead of it and be an early implementer of ultra-innovative technologies toward achieving carbon neutrality by 2050. We believe we bear responsibility for achieving carbon neutrality and providing a sustainable supply of steel, an indispensable material for society. We also consider it our responsibility to provide the Group's advanced technologies and services to society and, in turn, contribute to reducing overall CO_2 emissions. We will continue to promote initiatives to address climate change issues and contribute to creating a sustainable society.

Seiya Kitajima
Senior Executive Officer,
JFE Holdings, Inc.

* Carbon dioxide Capture and Utilization

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 fiscal 2021 to fiscal 2024, 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.84)

➤ **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, which has a particularly significant environmental impact, we will focus on reducing CO_2 emissions. In addition, we will emphasize the reuse of water resources and energy as well as the development and provision of environmentally sound products, process technologies, and resource recycling solutions.

Reduce CO_2 Emissions at JFE Steel

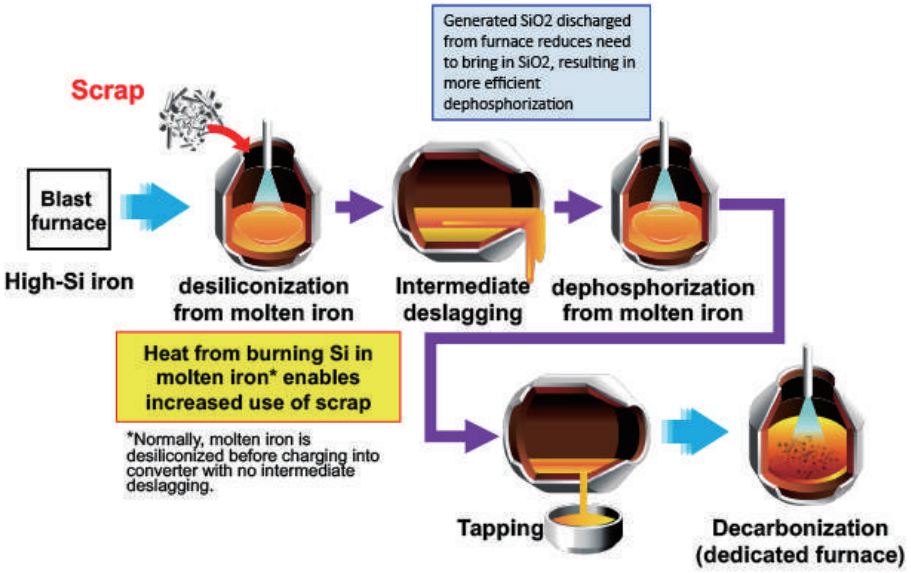
The JFE Group has adopted a multipronged approach, including the development of ultra-innovative technologies, to achieve carbon neutrality by 2050. In the steel business, we have set a target for reducing CO_2 emissions by 18% as of the end of FY2024 and by 30% or more by the end of FY2030, compared with 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. We will expand the use of low-carbon technologies to make steady progress toward achieving the CO_2 reduction target in FY2030. In this phase, we will also accelerate the research and development of ultra-innovative technologies to prepare for the innovation phase. In the innovation phase, we will focus on 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. We will also work on 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



Demonstration Tests for NEDO's "Hydrogen Utilization in Iron and Steelmaking Processes" Project

JFE Steel is actively working on initiatives to achieve 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 facilities in the East Japan Works (Chiba district) to conduct demonstration tests related to the project. Centralizing these facilities in the same area increases 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 (150 m^3)
  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, and electric arc furnaces, and we will also strive 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 aims for 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 is ultra-innovative in terms of its technology that converts CO_2 in the furnace exhaust gas into carbon-neutral methane through methanation, which is then used repeatedly 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 increased 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 facilitating more effective gas utilization at CCUS.

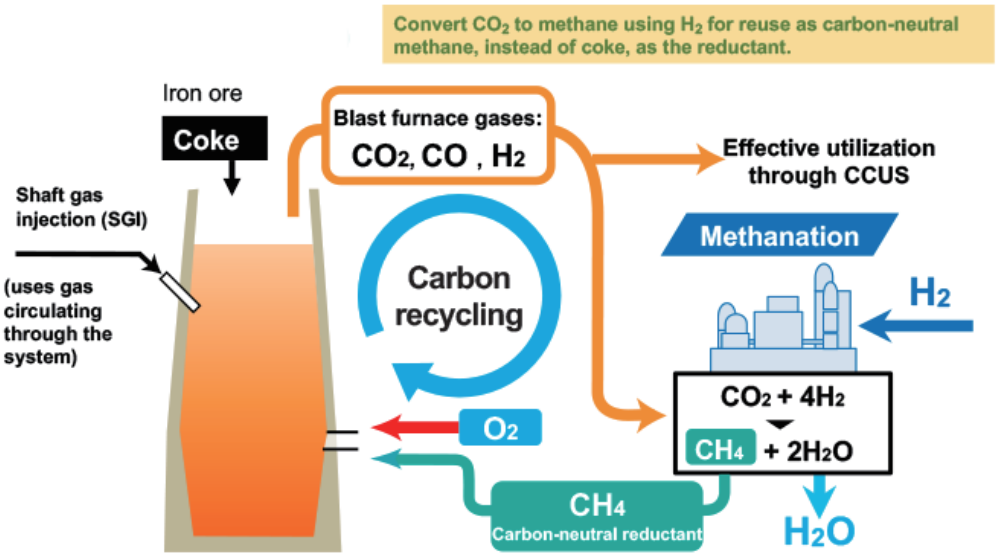
* Carbon dioxide capture, utilization, and storage

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

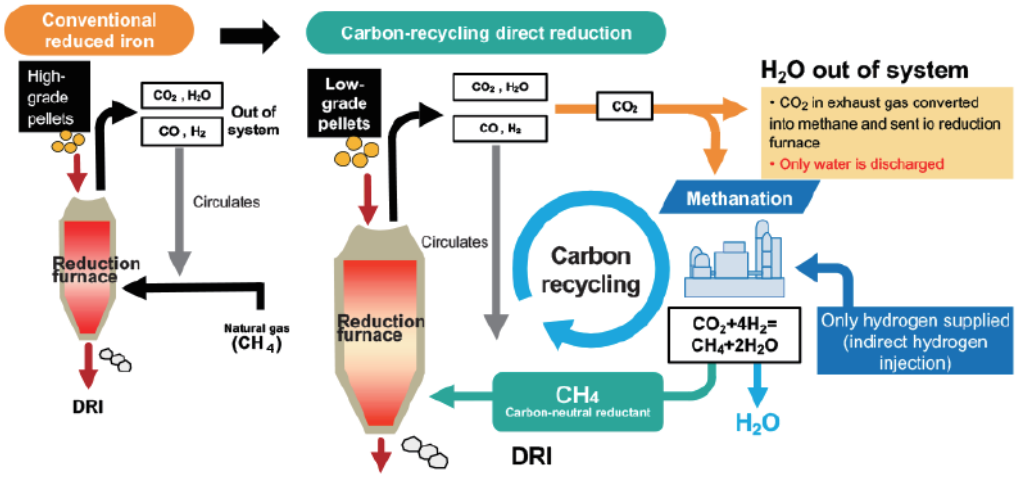
One challenge of hydrogen reduction is that the reduction of iron ore by hydrogen is an endothermic reaction, which means that heat must be applied externally for the reaction to proceed. A sufficient reduction reaction may not take place if there is not enough heat. Thus, technologies for heating raw 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 separating the exhaust gas into various components and for recycling the CO_2 through methanation
- Methods for using low-grade ores

■ Carbon-Recycling Direct Reduction Process



Development of Electric Arc Furnace Process Technology

One of the JFE Group's development efforts in steelmaking technologies for carbon neutrality is electric arc furnace process technology. With the 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 working 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 this advantage of reducing CO_2 emissions, there are two major problems with it 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-grade steel. We are working to address these issues and striving to establish technologies that will enable the production of high-quality, high-grade steel with high productivity in the electric arc furnace process.

Use Electric Arc Furnaces to Increase the Use of Scraps

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.

In the Kurashiki district, we are considering 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 Itochu Corporation and Emirates Steel Arkan (UAE) to jointly conduct detailed feasibility studies on the establishment of a supply chain of reduced iron with low-carbon emission. Under a joint venture to be established in the UAE, we are focusing on producing direct-reduced iron (about 2.5 million tons per year) from the second half of FY2025.

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.

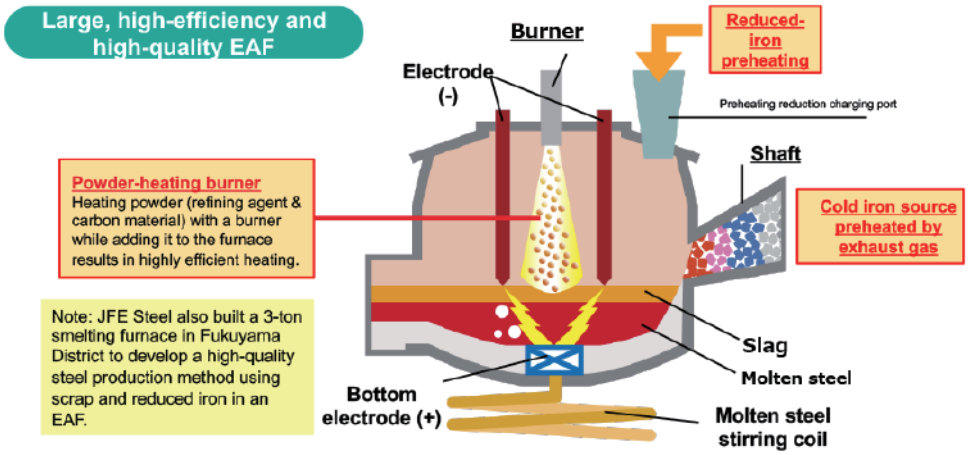
The Group already has achieved industry-leading productivity and energy (electricity) efficiency with these technologies, but we are working to raise productivity even further.

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.

Testing CO_2 Utilization Technologies for Practical Use

JFE Steel is working on "Optimum System for Methanol Synthesis Using CO_2," an R&D project, in collaboration with the Research Institute of Innovative Technology for the Earth. On-site construction of a test facility will commence 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 through the development of technologies for low-cost CO_2 separation and for 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.

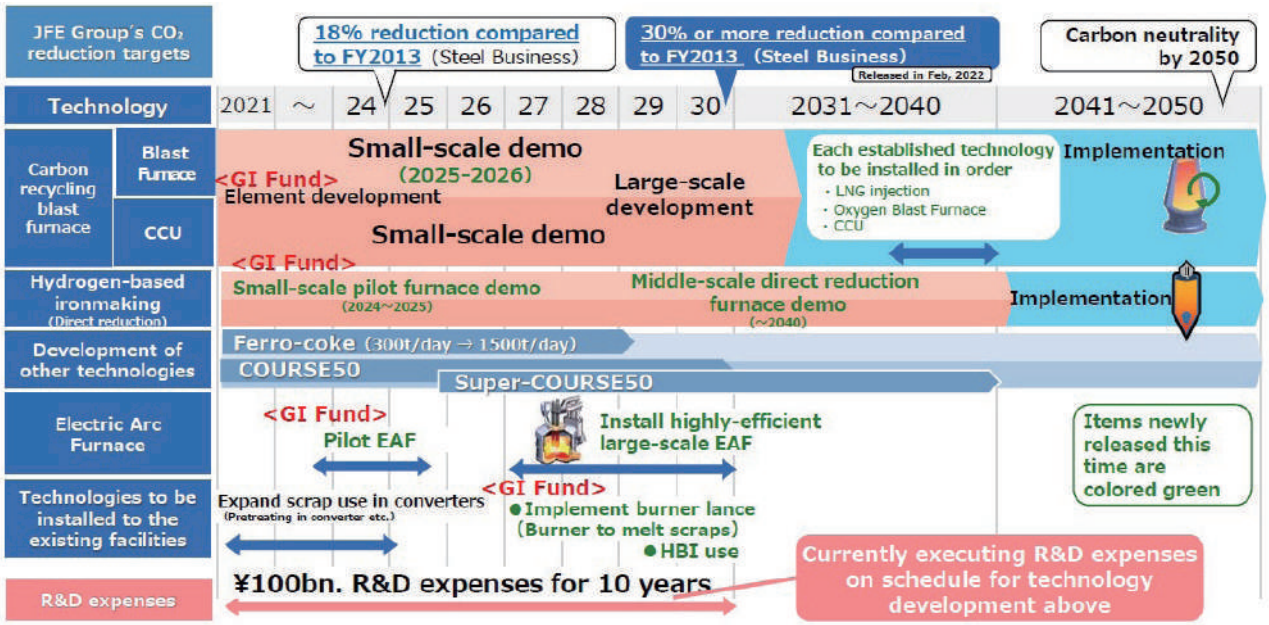
JFE Steel is also working on an R&D project, "Innovative CO_2 Sequestration Technology through Quick, Large-quantity Carbonation of Steel Slag," in collaboration with Ehime University. Construction for a practical application test facility is scheduled to commence in FY2023 in the Chiba district of the East Japan Works. The process principles will be verified by FY2022, and tests will be conducted within the period of FY2024–FY2025. The project will develop a new technology to sequestrate 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 from the hot steel slag and for converting the steel slag to roadbed materials and other products.

➤ Development and Provision of Eco-friendly Processes and Products (P.100)

■ Related Products and Technologies

Reduce CO_2 emissions at JFE Steel		
Carbon neutrality	Management Structure	JFE Steel Carbon Neutrality Strategy Briefing "New Teams Overseeing Carbon Neutrality Promotion" (https://www.jfe-steel.co.jp/en/company/pdf/carbon-neutral-strategy_220901_1.pdf)
	Key Initiatives	JFE Steel Challenge to Achieve Carbon Neutrality through Green Transformation (https://www.jfe-steel.co.jp/en/movie/index.html)
	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)
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 superinnovative 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 Emission (https://www.jfe-steel.co.jp/en/release/2022/220901.html)
	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)
CO_2 utilization	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)

■ **Roadmap to Carbon Neutrality in 2050**



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 is expected to increase. 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, as well as in supporting the establishment and operation of new regional electricity companies that focus on local production and consumption of energy using renewable sources.

As new initiatives toward 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.

Through these efforts, we will contribute to reducing CO_2 emissions in society by 12 million tonnes by FY2024 and 25 million tonnes by FY2030.

Electrical Steel Sheets

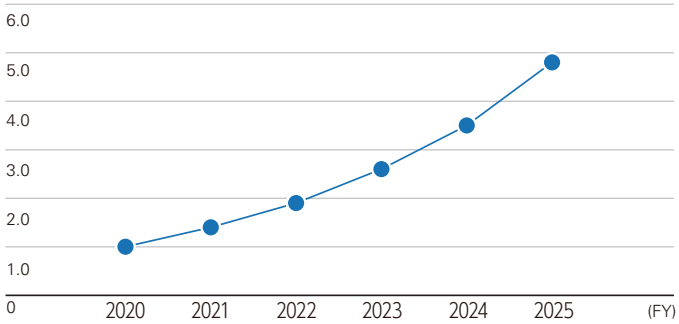
Electrical steel sheets are widely used as core materials for electrical equipment such as motors and transformers and therefore play an important role in determining the performance of such electrical equipment. JFE Steel is contributing to reducing CO_2 emissions on a global scale by supplying high-performance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

Non-Oriented Electrical Steel Sheets

In order to achieve carbon neutrality in society, 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 we have decided to invest approximately 49 billion yen to double the production capacity at the West Japan Works (Kurashiki district) in the first half of FY2024 to meet this demand.

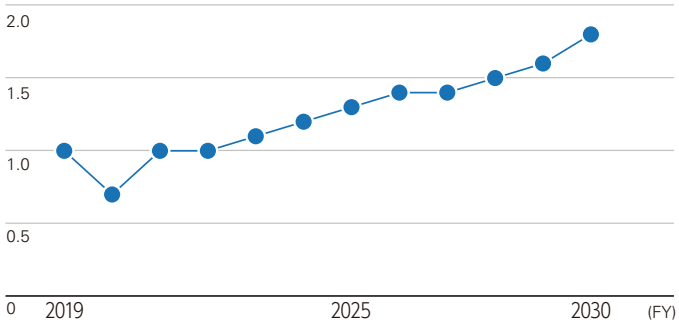
■ Demand for Non-Oriented Electrical Steel Sheets (Calculated by JFE; 2020 results = 1.0)



Grain-Oriented Electrical Steel Sheets

The global demand for grain-oriented electrical steel sheets in transformers is expected to increase due to continuous growing demand for electric power and the expanding adoption of renewable energy. Demand in India for grain-oriented electrical steel sheets is expected to increase by 1.8 times in 2030 compared to 2019. Moreover, we have agreed with our strategic-alliance-partner JSW to study the feasibility of establishing a joint, grain-oriented steel (G/O) manufacturing and sales company in India.

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



Super Core

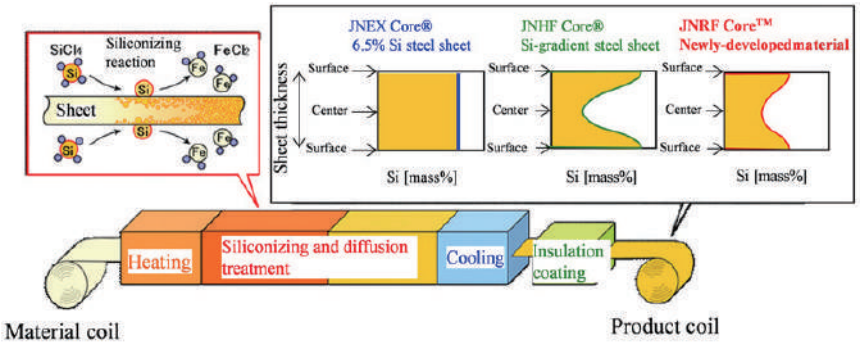
Motors are becoming increasingly smaller and faster for EVs, home appliances, drones, and other applications, which consequently requires higher output and efficiency. At the same time, demand is growing to reduce high-frequency iron loss*1 and increase magnetic flux density*2 for the electrical steel 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 the proprietary technology for CVD continuous siliconizing*3, we worked on controlling silicon concentration distribution 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 that of 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 ($SiCl_4$) 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 by establishing a new heat treatment method. Compared to conventional high-tensile steel sheets, these achieve higher yield strength and ductility, especially 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. This represents 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 vehicle body structural parts with complex shapes had been limited to the 1.3 GPa grade because increasing the strength of sheets can result in decreased cold press formability and delayed fracture resistance. To overcome these issues, the adoption of 1.5 GPa-grade high tensile strength steel sheets through a hot press forming process was more common. 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 that of 1.3 GPa-grade sheets, by using the 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.

* According to our research

JFE Steel develops and manufactures steel sheet products that are easy to use, with full consideration for environmental impact and their 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	New regional electricity	"Regional Electricity Retail Businesses in Partnership with the Local Municipal Governments Establishing New Regional Electricity Businesses" (P.116)
	Food waste recycling	"Food Waste Recycling Business" (P.115)
	Carbon-neutral world	"Contribution to creating a carbon-neutral world through the transport of hydrogen and CO_2" (P.114)
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)
	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)
		"Further expanding the global supply chain in electrical steel sheets business" (P. 118)
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

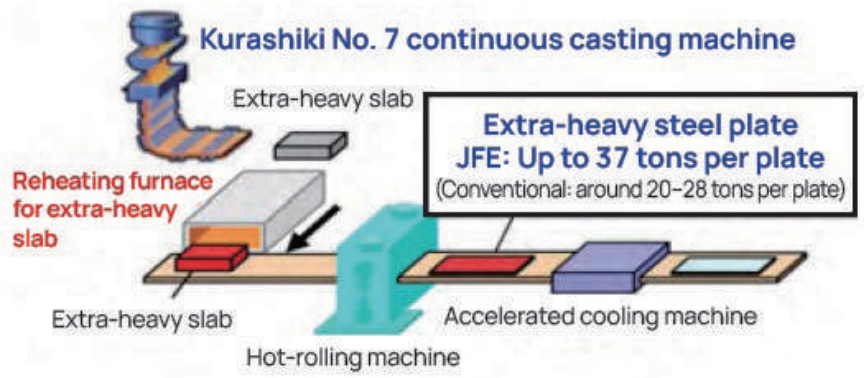
Offshore wind power generation is a key initiative of the Japanese government's Green Growth Strategy to achieve carbon neutrality by 2050. We will participate in this effort by leveraging the Group's collective strength with our engineering business acting as the main driver. Specifically, the Group 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

Large and Heavy Steel Plates for Offshore Wind-Power Generation

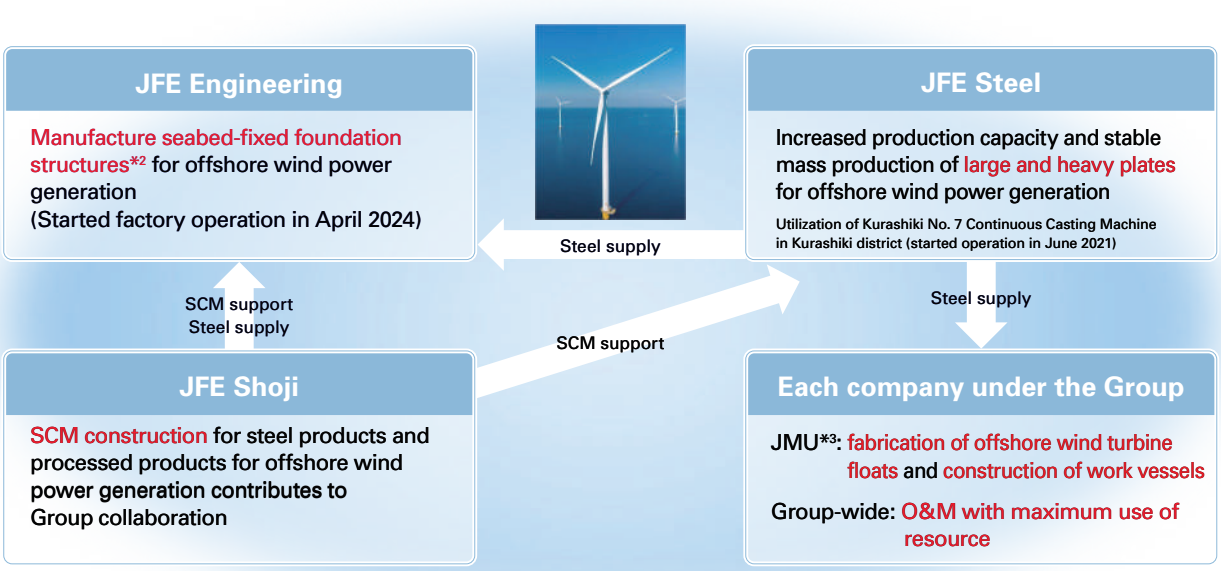
JFE Steel is preparing to start manufacturing large and heavy steel plates using the No. 7 Continuous Casting Machine (7CCM) in the Kurashiki district, which was recently put into operation. In recent years, offshore wind turbines have grown in size, requiring larger foundation structures to support them. These large-scale structures in turn call for larger steel plates—to reduce the amount of welding work, for example—and to increase manufacturing efficiency. The state-of-the-art 7CCM can manufacture extra-large slabs that can then be used to produce large and heavy steel plates of up to 37 tonnes each (previously limited to around 20 to 28 tonnes per plate in general), which will be one of the largest in Asia. We will invest in this state-of-the-art equipment at our plate mills and other facilities to supply large quantities of high-quality large and heavy steel plates capable of supporting wind turbines in harsh offshore environments for many years to come.

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



■ 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 aim 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.



*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
Ocean research	JFE Advantech	Ocean monitoring equipment
Analysis/Evaluation	JFE Techno-Research	Strength and durability testing and evaluation technologies for large structures
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
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	JFE Engineering	Technologies for remote monitoring and operation
	JFE Advantech	Vibration measurement equipment and systems
	Japan Marine United	Offshore support vessels (work vessels)
	JFE Plant Engineering	Technologies and expertise in onshore turbine maintenance
	JFE Technos	Technologies and expertise in onshore turbine maintenance
	JFE Techno-Research	Equipment evaluation and analysis for corrosion, fatigue, vibration, etc., and diagnosis of remaining service life
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. Government-private sector joint initiatives 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.

JFE Holdings, ENEOS Corporation, and JERA Co., Inc. have begun a joint study on establishing a hydrogen and ammonia receiving and supply base, and as part of this effort, we are considering utilizing the deep-water wharves and adjacent land areas of Ogishima island in the Keihin district. The JFE Group intends to play a role in building a stable and economical supply chain for hydrogen and other decarbonized fuels and to contribute to realizing carbon neutrality 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)

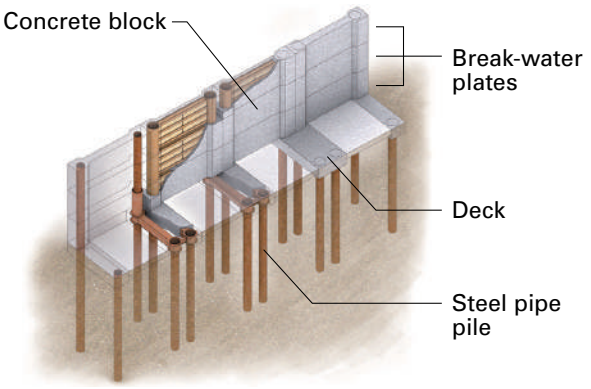
Contributions to Disaster Prevention and Mitigation and Increased National Resilience

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 infrastructures 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

➤ *1 The JFE Engineering Corporation's Steel infrastructure (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 dam

Terre Armée FS to Prevent Landslides, Mudslides, and Falling Rocks

Terre Armée, or reinforced earth, is a method for constructing strong vertical walls that involves placing layers of wide steel reinforcements in the embankments. The friction between the steel strips and the earth makes the structure very strong, and this is the most widely adopted method around the world for constructing reinforced walls. In Japan as well, the method has been used for various infrastructure developments such as highway and riverbank walls.

JFE Shoji Terre One Corporation, a subsidiary of JFE Shoji Corporation, has developed a new Terre Armee method, with a new fail-safe (FS) system. The feature helps to visually confirm the health of structures after they have been subject to unforeseen forces, such as massive earthquakes. Making the internal anomalies easily detectable helps to enhance structural safety, as it makes it possible to schedule necessary maintenance work in a timelier manner. We will promote the adoption of the new Terre Armée FS method to contribute to building disaster-resilient roads and towns.

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 CSR Council chaired by the president of JFE Holdings, consolidates information and strengthen management across the Group to reduce the frequency and impact of risks.

The executive officer responsible for risk works to identify potential ESG risks such as those associated with climate change. As necessary, the JFE Group CSR Council confirms and evaluates risks and discusses and makes decisions on countermeasures. Key managerial issue 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 and making decisions on, and by receiving reports on, these matters.

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

Monitoring Method for Core Issues Related to Climate Change

Issues that may affect management are being monitored by the JFE Group CSR Council, Group Management Strategy Committee and the Management Committee. As for the method, measures are implemented based on a quarterly report on climate change-related issues 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.

➤ CSR Structure (P.23)
➤ Risk Management (P.202)
➤ Environmental Management (P.50)

Metrics and Targets (Medium- and Long-term Targets and Results in FY2021)

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 its business to respond to developments in the environment facing the 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 the CO_2 emissions in FY2030 by 20% or more compared to FY2013 and to achieve carbon neutrality by 2050.

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

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 FY 2030 : 30% or more compared to FY2013 (JFE Steel)

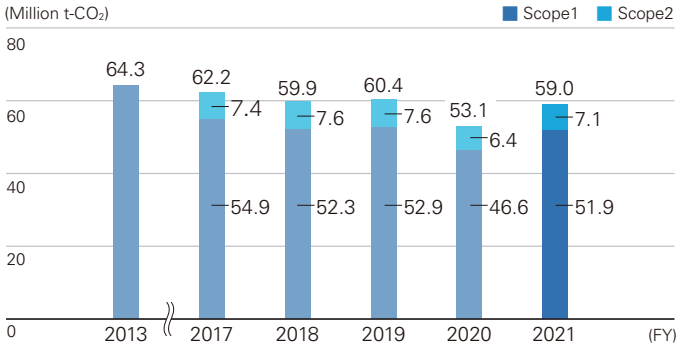
Initiatives for Carbon Neutrality by 2050

■ 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)

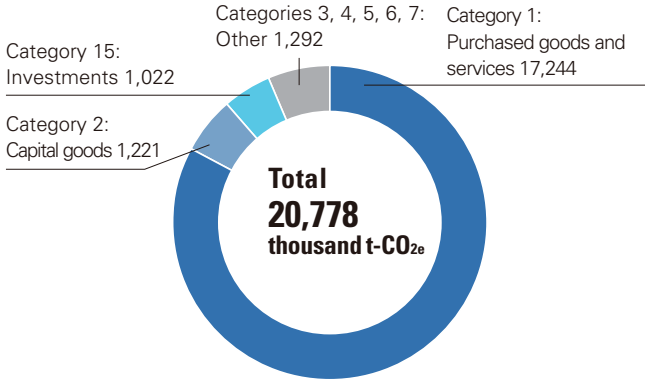
CO_2 Emissions of the JFE Group

■ CO_2 Emissions of the JFE Group



Notes:
- Data cover 79 companies
  JFE Steel and 29 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.
- FY2021 figure includes data for an expanded list of JFE Steel, JFE Engineering, and JFE Shoji major subsidiaries.

■ Scope 3 Emissions of the JFE Group (FY2021)



Coverage:
(Categories 1, 2, 3, 4, 5) JFE Steel, 23 JFE Steel major domestic subsidiaries, JFE Engineering, and JFE Shoji
(Category 6, 7) JFE Steel, 23 JFE Steel major domestic subsidiaries, JFE Engineering, 12 JFE Engineering major domestic and overseas subsidiaries, and JFE Shoji
(Category 15) Japan Marine United, and 9 JFE Steel equity-method affiliates (7 domestic and 2 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.207)

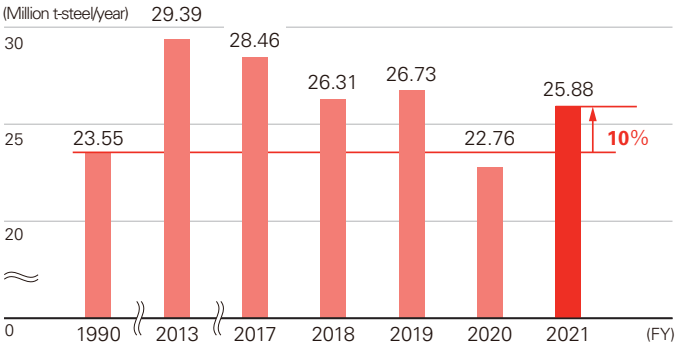
JFE Steel

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.

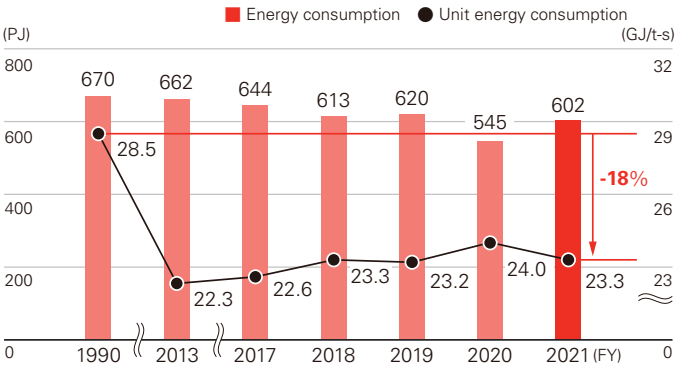
Energy Consumption and CO_2 Emissions in FY2021

■ Production of Crude Steel of JFE Steel



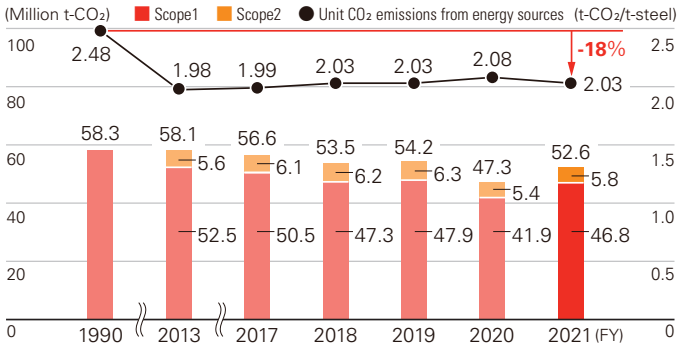
Note: FY2013 figure includes data for the Sendai Works of JFE Bars & Shapes Corporation.

■ Energy Consumption and Unit Energy Consumption of JFE Steel



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

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



Notes:

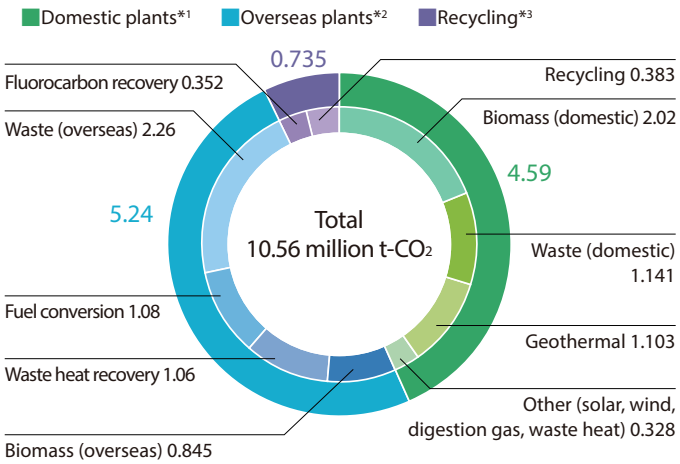
- The CO_2 emissions and emission intensity in FY2021 are calculated using the CO_2 emission factor for electricity purchased in FY2020, adopted by the Japan Iron and Steel Federation's Commitment to a Low Carbon Society.
- FY2020 data was revised by applying the CO_2 emission factor for electricity purchased in FY2020, 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 activities, such as expanding renewable energy generation and constructing and operating plastics and food recycling plants. In FY2021, the Company contributed to reducing 10.56 million tonnes of CO_2 emissions (a 14% increase in contribution compared to FY2020) in society as a whole. We intend to further expand our business and contribute to CO_2 emissions reductions of 12 million tonnes in FY2024 and 25 million tonnes in FY2030.

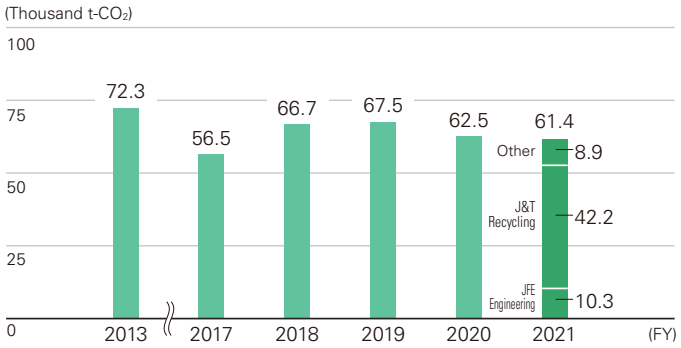
In addition, we have established an environmental management program and have been working on reducing waste and implementing energy-saving activities in our offices and manufacturing divisions. In FY2021, the Company also implemented such initiatives as the zero-emission electricity plan at its Yokohama head office, achieving a 34% reduction in its CO_2 emissions compared to FY2013. We will continue to conduct our business activities 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 (FY2021)



*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.

■ JFE Engineering Group's CO_2 Emissions from Energy Sources



Notes:
- Data cover JFE Engineering and 12 major domestic and overseas subsidiaries.
- FY2021 figure includes data for an expanded list of JFE Engineering major subsidiaries.

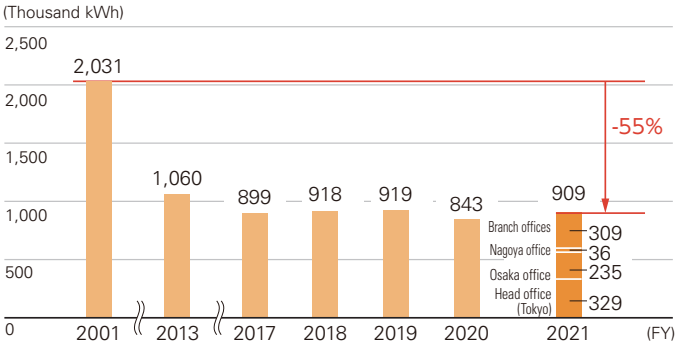
JFE Shoji

Under the environmental strategies formulated in 2001, JFE Shoji offices in Japan have consistently worked to reduce the use of electricity and paper and strictly manage waste separation.

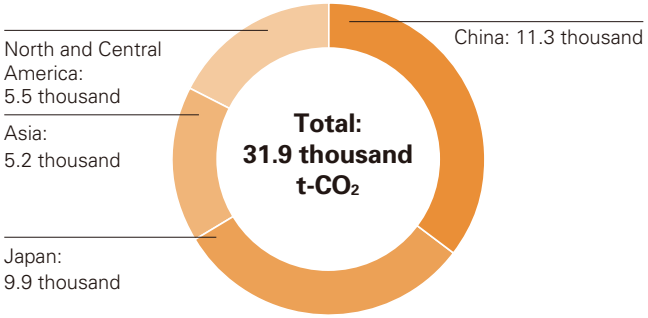
Efforts to cut electricity consumption such as leave-on-time days, prohibition of night work, and pinpoint lighting are now firmly rooted. Ongoing efforts are also made to improve the working environment through 5S activities and to raise operational efficiencies through robotic process automation (RPA). These efforts are contributing to reducing JFE Shoji's environmental impact.

Electricity consumption in the offices had previously decreased due to the COVID-19 pandemic and employees working from home. However, it has increased slightly in FY2021 as more employees have returned to our offices. We have 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 and are working to achieve it. In FY2021, CO_2 emissions in the domestic operating companies were reduced by 10.7%, compared to FY2019, by purchasing electricity derived from renewable energy sources.

■ Electric Power Consumption by JFE Shoji



■ CO_2 Emissions of the JFE Shoji Group (FY2021)



Notes:
- Data cover JFE Shoji and 35 major domestic and overseas subsidiaries.
- FY2021 figure includes data for an expanded list of JFE Shoji subsidiaries.

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 has endorsed the GX League Basic Concept since 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 programme, 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.

In April 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.

For more details, refer to the following.
➤ **Steel Industry Initiatives** (P.96)

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 Basic Concept** (https://www.meti.go.jp/english/press/2022/0201_001.html)
- **WSA: Climate Action data collection programme** (https://worldsteel.org/steel-topics/environment-and-climate-change/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/)

Scenario Analysis in Line with the TCFD Recommendations

The JFE Group intends to achieve carbon neutrality by 2050. The Group 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.56)

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**
JIFS published the report of Carbon Neutrality Action Plan phase I and revised the phase II (FY2030) target to a 30% reduction compared to FY2013

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, which is the long-term goal of the Paris Agreement. The JFE Group endorses the Challenge Zero declaration and will rise to the challenge in pursuit of 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. This is to prepare a list of companies generating innovation toward realizing a decarbonized society and to provide investors and other stakeholders with useful information on these companies. On October 9, 2020, on the occasion of TCFD Summit 2020, Mr. Kajiyama Hiroshi, Minister of Economy, Trade and Industry, published a list entitled Companies Taking on the Zero-Emission Challenge, which includes a total of about 300 named and unnamed companies. The JFE Group was selected for the category "Companies Taking on the Zero-Emission Challenge." These are organization who are boldly accepting the challenge of innovation to realize a decarbonized society.

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 business strategies that reflect this assessment. We selected the following scenarios in consideration of the potentially high exposure our business has to the impacts of climate change. Moreover, we expanded the scope to also include the 1.5°C scenario in FY2022.

Both scenarios are based on those developed by the International Energy Agency (IEA). Analysis is conducted under the assumption that a uniform carbon price is implemented by major emitting countries toward the realization of the 2°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.
· World-wide/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, average temperature rises 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 "World Energy Outlook 2018"

*2 Source: IEA "Energy Technology Perspectives 2017"

*3 Source: IEA "Net Zero by 2050 – A Roadmap for the Global Energy Sector"

*4 Source: IPCC Fifth Assessment Report

*5 If prices of carbon differ from country to country, there will be a gap in international competitiveness between countries that impose strict CO_2 emissions regulations and less strict regulations. This will result in carbon leakage where CO_2 emissions of a strict climate policy country are reduced due to decreased production and investment, while production at and investment to other countries with laxer emission constraints increase, thereby increasing the CO_2 emissions in those countries. One reference scenario, SDS, assumes that carbon pricing is implemented in developed countries and some developing countries. We took this into account in formulating the 2°C scenario based on the assumption that a uniform carbon pricing is introduced to major emitting countries to push toward achieving the target of two degrees.

Scope of Business and Period for Analysis

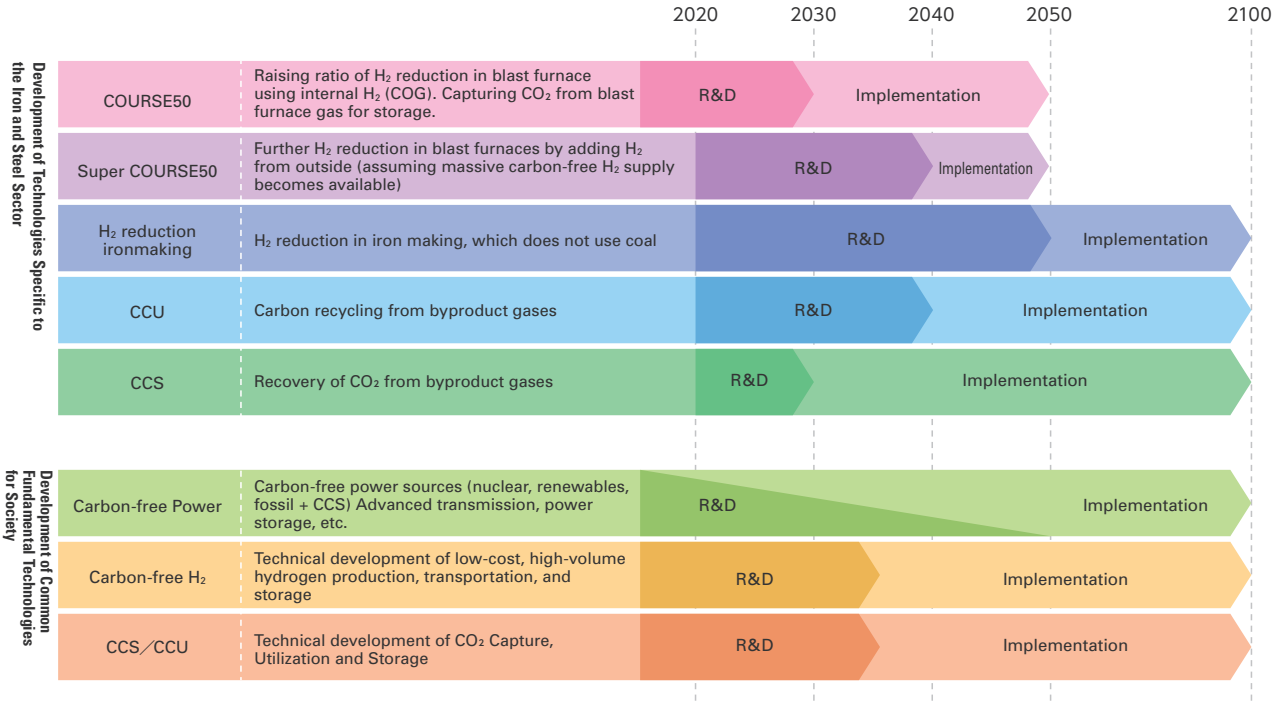
This analysis covers the following businesses: the steel business by JFE Steel, the engineering business by JFE Engineering, the trading business by JFE Shoji, and businesses carried out by some of the other Group companies. The period covered is up to 2050.

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.29))

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 it manifests)
- Expectations and concerns of stakeholders

Results of Scenario Analysis

The issue of 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 and have also successfully reduced CO_2 emission intensity to the lowest level worldwide. 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 issues 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 1** 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 → Introduce carbon price	• Significantly contribute through innovative technologies • Increase in investment to implement innovative technologies • Increase in operating costs due to 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℃ scenario → The Group's cost competitiveness will be maintained by implementing of a uniform carbon price across all countries ↗ Operating cost increases (if carbon pricing is not properly introduced)
1.5/2°C Scenario **Key Factor 2** 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 3** 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 multi-materials 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 multi-materials • 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 multi-materials is limited
1.5/2°C Scenario **Key Factor 4** 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 5** 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 6** 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 7** 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: Mid-term ⇒until 2024, 2030 ⇒until 2030, 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.

Mid-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.

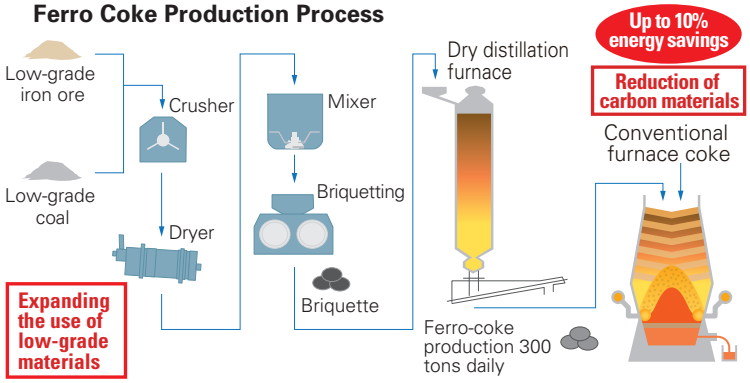
Mid-term, 2030, 2050

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.

A medium-scale pilot plant with the capacity to produce 300 tonnes of ferro coke per day was constructed in the Fukuyama district of the JFE Steel West Japan Works, and we are also promoting experimental runs from October 2020.

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



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 a 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.

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 social 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 across society and a long-term strategy by the government 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 endorsing the GX League Basic Concept*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 The GX League Basic Concept (https://www.jfe-steel.co.jp/en/release/2022/220325.html)

Cost competitiveness will be maintained in case uniform carbon pricing is introduced across all countries.

Mid-term, 2030

Various approaches to carbon pricing have been introduced around the world, and in Japan as well the analysis for carbon pricing such as carbon taxes and emissions trading has started toward 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 high in Japan compared to 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 monitor emerging trends closely in order to see whether 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.

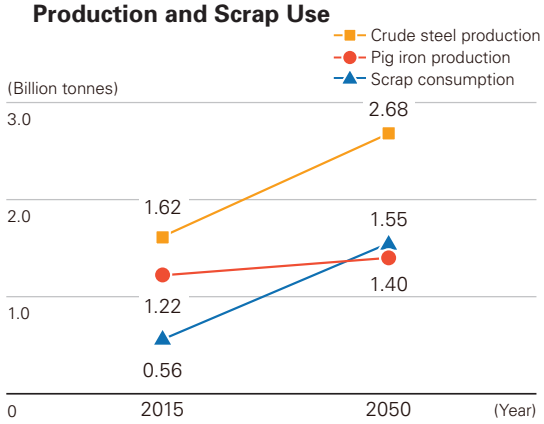
Mid-term, 2030, 2050

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 CO_2. 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 world-wide 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. 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.

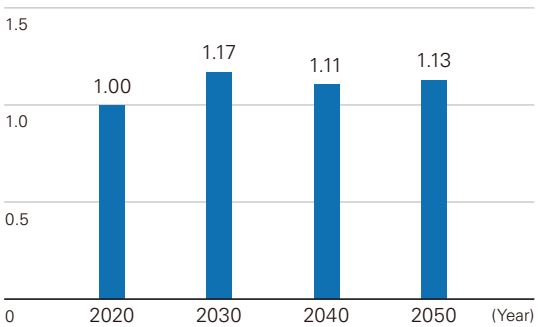
Mid-term, 2030, 2050

The trend of increasing electric vehicles has given rise to rapidly expanding demand for electrical steel sheets used in EV motors. JFE Steel has already marketed the JNE series of non-oriented electrical steel sheets, used in building motors, as part of its eco-product lineup. It also commands a strong share of the market.

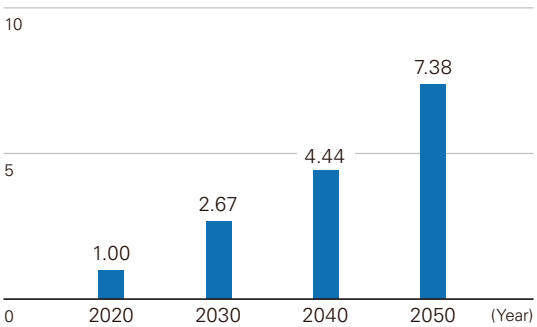
On the other hand, it has been pointed out that an increase in EVs may lead to a decline in the amount of special steel used in engine components. The amount of this type of steel, used in hybrid vehicles and electric vehicles, is 80% and 60% of gasoline cars, respectively. We believe that the risk level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

Nonetheless, the situation for EV remains the same in terms of strong demand for weight reduction of body structure. 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 needs for more environmentally sound options, we intend to expand its application and further increase its strength, thus dramatically reducing CO_2 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 reports by Strategic Commission for the New Era of Automobiles (METI)

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

Mid-term, 2030, 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.

Mid-term, 2030, 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, will explore other means for supplying products with low environmental impact. We plan to increase the annual production capacity of the electric arc furnaces in the Sendai Works by approx. 0.14 million tonnes by FY2024, reducing emissions by approx. 0.10 million tonnes. In addition, we are establishing technologies to improve the quality of high-grade steel products in the electric arc furnace process. This will enable the use of electric arc furnaces to manufacture parts that currently depend on the availability of blast furnaces, such as steel bars and wire rods for automobiles, and consequently meet the demand for low-CO_2 emission steel products.

Effect of trend to use multi-materials is limited.

Mid-term, 2030, 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 price, 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 **Mid-term, 2030, 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*1, geothermal*2, solar*3, 4, 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 (production is scheduled to start in 2024)*5. 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*6 to fully deploy Group resources.

Furthermore, from the perspectives of resource recycling and the effective use of resources, we are taking action to increase power output at waste processing facilities. JFE Engineering is developing a fully automated operation*7 to facilitate higher power output at incinerators (ten facilities in 2021, and an additional two facilities in 2022, with more to follow).

Moreover, we are utilizing renewable energy as the main power source for our retail electricity business*8 and in helping to establish and operate regional electricity retail companies*9, 10 focused on local production and consumption of electricity based on renewable energy (2020: 8 locations → FY2024: targeting around 10 locations → 2030: targeting around 20 locations).

(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)

Biomass power generation plant

Waste-to-energy power generation plant

➤ *1 The JFE Engineering Corporation's Biomass (https://www.jfe-eng.co.jp/en/produwcts/power/s02.html)

➤ *2 The JFE Engineering Corporation's 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)

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

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

*6 Operation and maintenance

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

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

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

➤ *10 Establishing regional electricity retail companies in partnership with local municipal governments (P. 116)

Multisite Energy Total Service **Mid-term, 2030, 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 **Mid-term, 2030, 2050**

We are striving to reduce the use of new fossil fuel-derived materials by recycling waste plastics and food wastes. 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 finished PET bottles are recycled into new PET bottles, 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. Therefore, we 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 **Mid-term, 2030**

From the perspective of the steel industry, there is space 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 world-wide. 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.

Mid-term, 2030

In Australia, our major source country for raw materials, the occurrence of typhoons is predicted to double. We may be vulnerable in terms of continuous production and suffer a loss if production and shipping are interrupted for too long.

To address this issue, 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 Russia and 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 also 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.

Mid-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 the steelworks. Although no severe drought disaster has struck since the 1994 disaster, 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 so as 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.

Mid-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 are 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. 75)
➤ **Permeable Steel Slit Dams** (P. 76)
➤ **Terre Armée FS** (P. 76)

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.96)
Targets and Results Related to Climate Change: ➤ **Material Issues of Corporate Management and KPIs** (P.19)
Initiatives on Climate Change: ➤ **Climate Change** (P.56)
Technologies and Products Related to CO_2 Emissions:
➤ **Development and Provision of Eco-friendly Processes and Products** (P.100)

Steel Industry Initiatives

The Japan Iron and Steel Federation (JISF) Initiatives

Long-term Vision for Climate Change Mitigation

JISF has been focusing on achieving the goals for 2020 under its Commitment to a Low Carbon Society (renamed Carbon Neutrality Action Plan in FY2021). In addition, JISF also formulated and published in November 2018 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. Furthermore, 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 JISF's Long-term Vision for Climate Change Mitigation (P.86)

JISF's Carbon Neutrality Action Plan

During the first commitment period of the Kyoto Protocol, the JISF engaged in the Voluntary Action Program and subsequently in the Commitment to a Low Carbon Society (Phase I) until the end of FY2020. From FY2021, the JISF renamed the initiative as the "Carbon Neutrality Action Plan" and started Phase II with the target year of FY2030. Under this plan, the JISF is voluntarily promoting initiatives based on the Three Ecos and the development of ultra-innovative technologies in iron and steelmaking processes.

■ Japan Iron and Steel Federation's Medium- to Long-term CO_2 Reduction Targets, "Carbon Neutrality Action Plan"

Three Ecos		Eco Processes	Eco Products	Eco Solutions
Goal		Further improve energy efficiency by taking full advantage of cutting-edge technologies	Provide high-performance steel materials that result in high performing end-products and thus reducing CO_2 emissions	Reduce CO_2 in developing countries through the transfer and application of world-leading, energy-saving Eco Process technologies
Targets	FY2020 (phase-I)	Reduce CO_2 emissions by 5 million t-CO_2 compared to the BAU benchmark • Energy-saving: 3 million t-CO_2 • Efficient use of waste plastics, etc.: 2 million t-CO_2	The use of major high-performance steel materials to contribute to a CO_2 reduction of approximately 34.0 million t-CO_2	Estimated CO_2 reduction impact of 70 million t-CO_2
	FY2030 (phase-II)	Reduce energy-derived CO_2 emission by 30% in FY2030 compared to FY2013*	The use of major high-performance steel materials to contribute to a CO_2 reduction of approximately 42.0 million t-CO_2	Estimated CO_2 reduction impact of 80 million t-CO_2
Phase I Result (results at the end of FY2020)		Reduced CO_2 emissions by 6.48 million t-CO_2 compared to the BAU benchmark (exceeding the target by 3.48 million t-CO_2)	Contributed to CO_2 reductions of approximately 32.26 million t-CO_2 in Japan and overseas	Estimated reduction of 72.64 million t-CO_2

* Premised on macro assumptions in the government's Strategic Energy Plan and prerequisites for implementing the various measures are met.

Source: The JISF's publicly available materials

Performance Assessment of Commitment to a Low Carbon Society (Phase I) (JISF)

In FY2020, emissions by the Japanese steel industry decreased by 6.48 million t-CO_2 compared to the BAU emissions* benchmark, exceeding the Phase I target. Various self-improvement efforts, such as raising the efficiency of coke ovens and generation facilities, have steadily contributed. As a JISF member, JFE Steel has also played its part in achieving the target. As well as working on self-improvement efforts, the Company has been investing in research and development for new energy-saving technologies.

* Business As Usual emissions: Estimated level of emissions in the absence of any special measure.

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

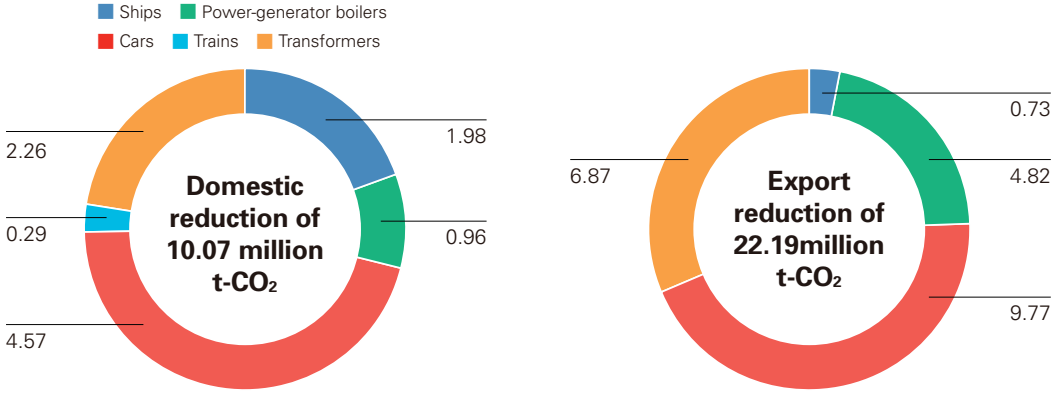
The Japanese steel industry intends to develop ferro coke that accelerates and lowers the temperatures of the reduction reaction in a blast furnace as well as its operational processes to conserve energy further and expand the use of low-rank materials. A medium-scale plant capable of producing 300 tonnes of ferro coke per day has been constructed in JFE Steel's West Japan Works (Fukuyama district) and experimental testing for practice use implemented from FY2020.

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

The Japan Iron and Steel Federation (JISF) believes the use of high-performance steel materials will reduce CO_2 emissions. It is estimated that the use of five major high-performance steel materials for cars, transformers, ships, power generator boilers, and trains in Japan and overseas* (FY2020 production: 6.06 million tonnes, 7.3% of crude steel production) helped to reduce CO_2 emissions by 32.26 million tonnes (10.07 million tonnes in Japan, 22.19 million tonnes overseas) in FY2020.

*Estimates created by the Institute of Energy Economics, Japan
*Materials included are steel sheets for automobiles, directional electrical steel sheets, thick steel sheets for shipbuilding, steel tubes for boilers, stainless steel sheets.
*For the domestic figures, the calculation includes data from FY1990 onward. For the export figures, the calculation includes data from FY2003 onward for automobile and shipbuilding, from FY1998 onward for steel pipes for boilers and from FY1996 onward for electrical steel sheets.

■ **CO_2 Reduction Resulting from the Use of Five High-performance Steel Materials in Japan and Abroad (FY2020)**



Global Scale Initiatives

Addressing 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 the Development of Calculation in LCA

Accurately evaluating the environmental impact of products requires assessment and quantification is required 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 methods.

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.

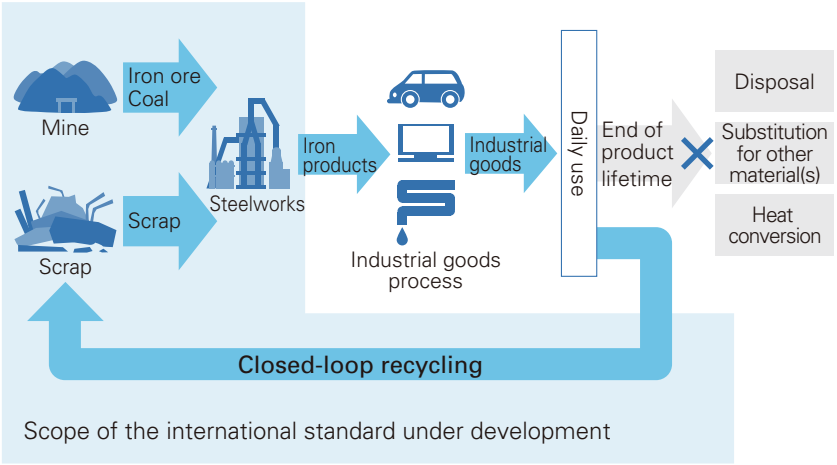
JFE Steel played a major role in the development of ISO 20915 (Life Cycle Inventory Calculation Methodology for Steel Products) and JIS Q 20915 (Life Cycle Inventory Calculation Methodology for Steel Products), initiatives led by the Japan Iron and Steel Federation (JISF), which takes into account the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

In addition, 15 Japanese manufactures of blast furnaces and electric arc furnaces joined forces to calculate the Japanese average for LCI of different steel products. Calculations results 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) and five building material products (H-beams, Super High Slend® H beams, extra-thick H beams, construction steel plates, and construction steel columns). We will continue to leverage EcoLeaf labels to help our customers promote environmental protection and to strengthen communications with them.

➤ Value of Steel (P.6)

■ **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)
➤ The Japan Iron and Steel Federation (JISF): LCA of Steel Products page (https://www.jisf.or.jp/en/activity/lca/index.html)
➤ The Japan Iron and Steel Federation (JISF): Publication of ISO 20915 (https://www.jisf.or.jp/en/activity/lca/iso/index.html)
➤ The 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

Based on 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/)

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**

Product/Technology	Environmental Benefit	Operating Company	Status
➤ Ferro-coke (P.102)	Save energy and reduce CO_2 emissions	JFE Steel	Experimental operation
➤ Resource saving silicon gradient steel sheet (P.104)	Save energy and reduce CO_2 emissions		Commercialized
➤ Large and Heavy Steel Plates for Offshore Wind Power Generation (P.73)	Expand renewable energy		Business expansion
➤ HBL® Series steel sheets with low yield ratio and high toughness for building structures (P.105)	Save resources, reduce CO_2 emissions, and prevent natural disasters		Commercialized
➤ Denjiro™ insulation-coated pure-iron powder for soft magnetic composites (P.106)	Recycle resources and reduce CO_2 emissions		Commercialized
➤ Battery-protected vehicle body structure based on JFE's topology optimization technology (P.107)	Recycle resources and reduce CO_2 emissions		Under development
➤ Optimal system for CO_2-based methanol synthesis (P.108)	Recycle resources and reduce CO_2 emissions		Under development
➤ Innovative CO_2 fixing technology through quick, large-quantity carbonation of steel slag (P.108)	Recycle resources and reduce CO_2 emissions		Under development
➤ Calcia improvement material (P.109)	Recycle resources and preserve biodiversity		Commercialized

Product/Technology	Environmental Benefit	Operating Company	Status
Steel slag hydrated matrix (P.110)	Recycle resources and reduce CO_2 emissions	JFE Steel	Commercialized
Precast concrete products mixed with finely ground blast furnace slag (P.110)	Recycle resources and reduce CO_2 emissions		Commercialized
Granulated blast furnace slag (P.111)	Recycle resources, preserve biodiversity, and reduce CO_2 emissions		Commercialized
Marine Stone™ (P.111)	Recycle resources and preserve biodiversity		Commercialized
Frontier Rock™ (P.111)	Recycle resources, preserve biodiversity, and reduce CO_2 emissions		Commercialized
Marine Block™ (P.111)	Recycle resources, preserve biodiversity, and reduce CO_2 emissions		Commercialized
Contribution to the realization of a circular economy (P.112)	Recycle resources and save energy	JFE Engineering	Business expansion
JFE CCU-Ready process for waste-to-energy facilities (P.113)	Reduce CO_2 emissions		Business expansion
Contribution to realizing carbon neutrality through hydrogen and CO_2 transportation (P.114)	Supply hydrogen and reduce CO_2 emissions		Under development, business expansion
Food waste recycling business (P.115)	Recycle resources and expand renewable energy	J&T Recycling	Business expansion
Establishing new regional electricity businesses (P.116)	Recycle resources and expand renewable energy	JFE Engineering	Business expansion
Infrastructure construction for strengthening the resilience of national land (P.117)	Prevent natural disasters		Business expansion
Further expansion of global supply chain for the Steel Sheets Business (P.118)	Save energy and reduce CO_2 emissions	JFE Shoji	Sales expansion
Building a supply chain for steel materials and processed products for offshore wind power generation (P.118)	Expand renewable energy		Business expansion
Expanding business in biomass fuels (P.119)	Expand renewable energy and reduce CO_2 emissions		Sales expansion
Expansion of scrap trading to help develop a recycling-oriented society (P.119)	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.56)
- 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, SUPER-HISLEND-H® (SHH), extra heavy H-beams, heavy plates, and columns.

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 visualized 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 evaluate the environmental impact of the products that they use in both a quantitative and objective way.

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

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

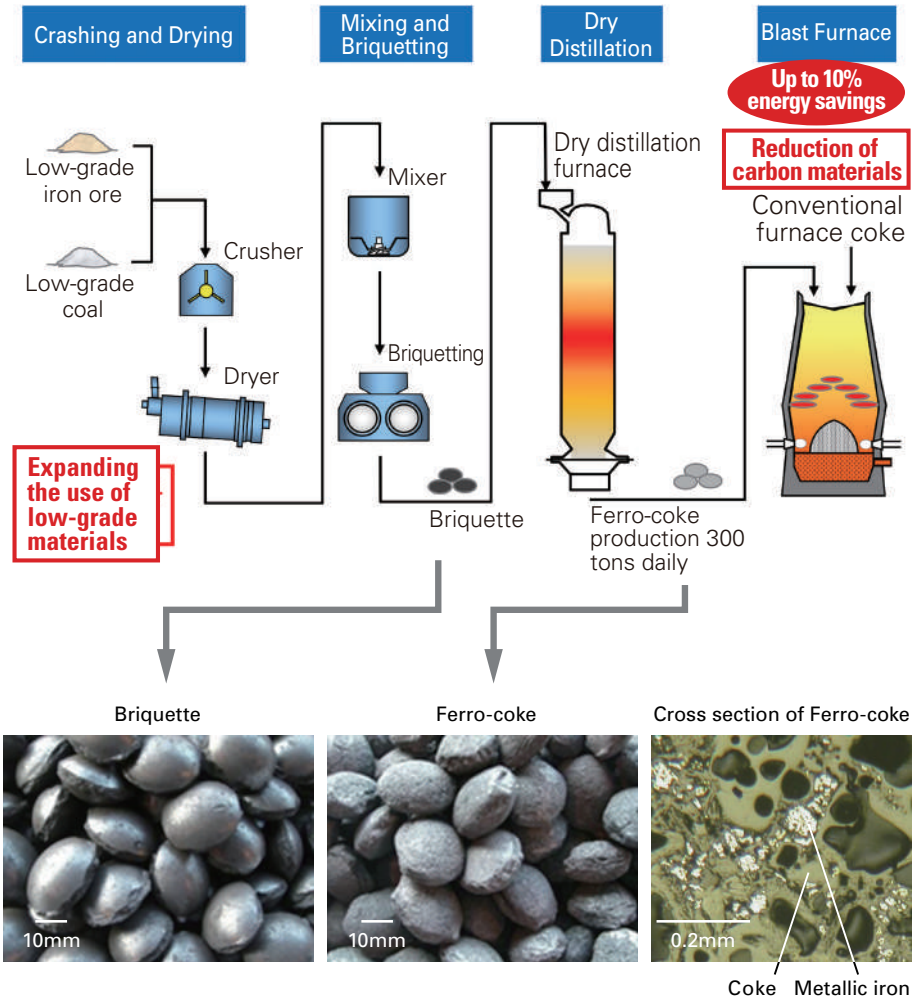
Ferro-Coke

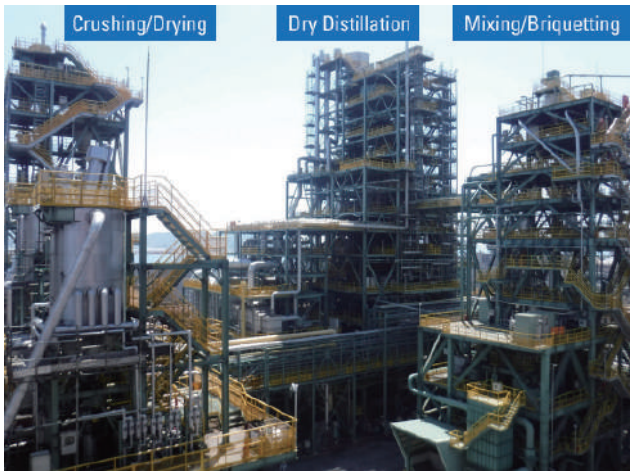
Ferro-coke is an innovative raw material for blast furnaces made by mixing low-grade coke and iron ore. A composite mass of metallic iron and coke is produced by pre-milling, mixing, and molding coal and iron ore and then heating the mixture in a dry distillation furnace. In this energy-saving technology, ultra-fine metallic iron inside acts as a catalyst and accelerates the reduction reaction rate in the blast furnace, reducing the amount of coke required and thus significantly reducing CO_2 emissions in the iron making process.

Since FY2017, JFE Steel has been promoting the New Energy and Industrial Technology Development Organization (NEDO) project to develop environmental technology for the steelmaking process, and technological development of the iron making process using Ferro-coke. As part of the project, a medium-scale facility with the capacity to produce 300 tonnes of ferro-coke per day was constructed in the Fukuyama district of the JFE Steel West Japan Works, covering 12,600 square meters of ground. Experimental operations began in October 2020. This facility is one-fifth the scale of the projected 1,500 tonnes per day of commercial production capacity and is capable of handling the entire process from crushing and drying raw materials to molding and dry distillation (applying heat to bake the material). It is also capable of recycling ferro-tar, a byproduct of ferro-coke production, as a binding agent for briquetting.

In FY2021, we conducted a short-term test on using ferro-coke in blast furnaces by making and storing ferro coke in a temporary storage area. In FY2022, we will conduct tests on the long-term use of the blast furnace and quantify the effect of reducing the reduction material ratio to establish the technology for reducing CO_2 emissions and energy consumption in the iron making process by about 10% by around 2023.

■ Process Flow of the Medium-scale Ferro-Coke Production Facility





Medium-scale Ferro-Coke Production Facility

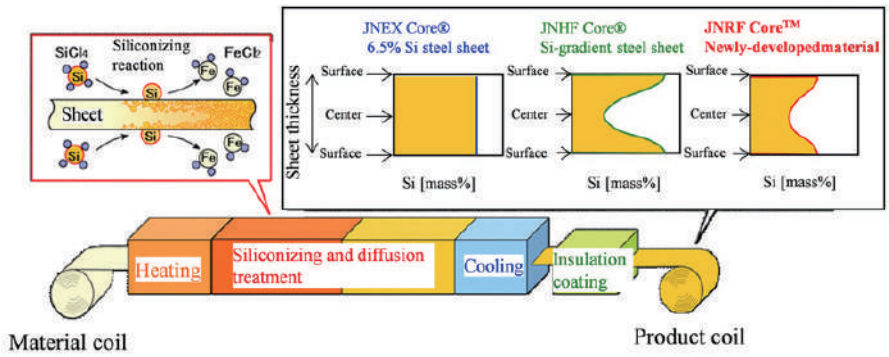
Resource Saving Silicon-gradient Steel Sheet

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

To overcome this problem, JFE Steel developed JNHF®, in which Si concentration is only increased in the surface layer by using its proprietary chemical vapor deposition (CVD) continuous siliconizing process technology. We also developed JNSF®, in which Si is localized in the surface layer of the steel sheet by making the steel composition an austenite phase (γ phase) in which the diffusion rate of Si is slow during the silicon carburizing process, and we succeeded in further reducing high-frequency iron loss. Furthermore, we developed JNRF® with higher magnetic flux density by controlling the collective structure and Si distribution in the sheet thickness direction. JNRF® has low iron loss at high frequencies and high magnetic flux density, significantly contributing to greater efficiency while downsizing the electrical equipment, and it is used as an iron core material for reactors for solar power generation and high-speed motors. In recognition of the positive impact of this development on society, 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 material 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. 241)

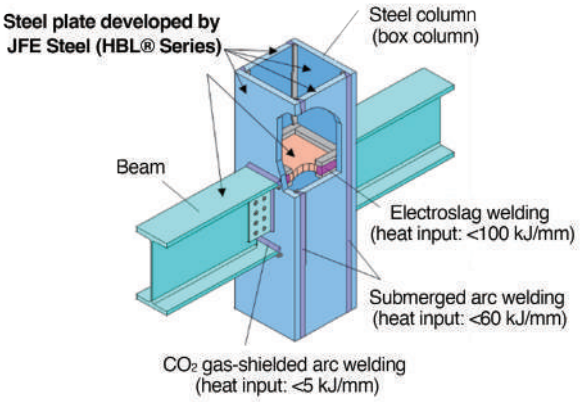
HBL®*1 Series Steel Plates with Low Yield Ratio and High Toughness for Building Structures

Steel plates used for steel columns and beams of building structures are required to have high strength as components of super high-rise buildings and wide spaces, as well as excellent deformation performance to withstand major earthquakes. In addition, another key issue is toughening the welds to enable highly efficient ultra-large heat input welding (maximum heat input: about 100 kJ/mm) when manufacturing steel columns (box columns).

JFE Steel developed the HBL® series of steel sheets for building structures featuring low yield ratio and high toughness by establishing advanced microstructure control technology to achieve extremely fine multiphase microstructure and microalloying technology to increase the toughness of ultra-large heat input welds. In the past, we developed the HBL® series of steel plates for building structures with a maximum thickness of 100 mm, including HBL®325, HBL®385, and HBL®440, which have been applied to numerous building structures. All of these are capable of ultra-large heat input welding, exhibit high toughness and low yield ratio*2, and contribute to higher building structures, earthquake resistance, and labor saving in welding work. The application of highly tough steel plates also results in significant resource savings and CO_2 reduction by reducing steel plate weight. The steel plates contribute to raising the resilience of Japan's national land and will greatly benefit the future development of cities and society as well as improve the safety of daily life. JFE Steel was awarded the 68th Okochi Memorial Technology Prize for 2021 in recognition of its service to society.

*1 Abbreviation of HITEN-BuiLding. Also signifies High Performance Steel Plates for BuiLding. The numbers that appear after the product name, as in HBL®385 and HBL®440, indicate the lower limit of yield point or 0.2% proof stress.
*2 The ratio of yield stress to tensile strength. Applying steel sheets with a low yield ratio to steel columns absorbs seismic energy and prevents building structures from collapsing.

■ Steel column (box column) in building structures



■ Example of super high-rise buildings using HBL®385

Toranomon Hills Area Project
(photo courtesy of Mori Building Co., Ltd.)

➤ Awarded the 68th Okochi Memorial Technology Prize for 2021 (Japanese only)
(https://www.jfe-steel.co.jp/release/2022/03/220323.html)

➤ External Awards (P. 241)

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

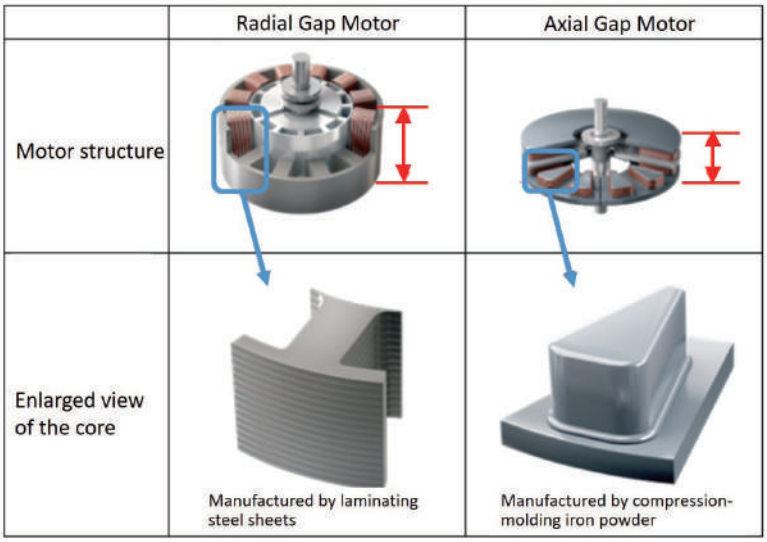
Demands for extra-compact high-torque motors is growing in parallel with the popularization of EV. JFE Steel developed Denjiro™, an insulation-coated pure iron powder for soft magnetic composites as an important material for axial gap motors, which can be smaller than conventional radial gap motors and are expected to be suitable for expanded applications, especially automotive applications. 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 achieve low loss at high operating frequencies and possess magnetic characteristics highly suited to complex-shape 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.

For example, a soft magnetic composite developed with Denjiro™ achieves less iron loss than both a 0.5 mm-thick electrical steel sheet (50A400) in a frequency range exceeding 400 Hz and 0.35 mm-thick electrical steel sheet (35A300) in a frequency range exceeding 800 Hz, demonstrating the suitability of soft magnetic composites for high-rpm motors. With the commercialization of Denjiro™, the JFE Group has established a system for providing a broad lineup of soft magnetic materials suited to nearly all currently applicable frequency ranges, from electrical steel sheets to soft ferrite cores, and has become the world's only comprehensive supplier capable of providing optimal one-stop solutions for all power supply equipment, including motors.

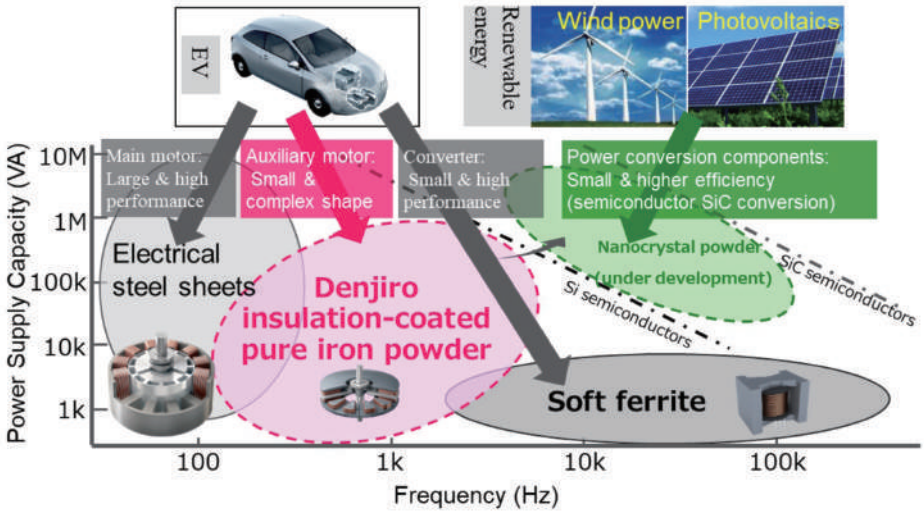
Furthermore, Group company JFE Chemical Corporation manufactures and sells a soft ferrite core suited to the high-frequency ranges (several tens of kHz and higher) of inductors and electronic-device transformers through its subsidiary JFE Ferrite Corporation.

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

■ Types of Motors



■ **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)

Battery-Protected Vehicle Body Structure Based on JFE's Topology Optimization Technology

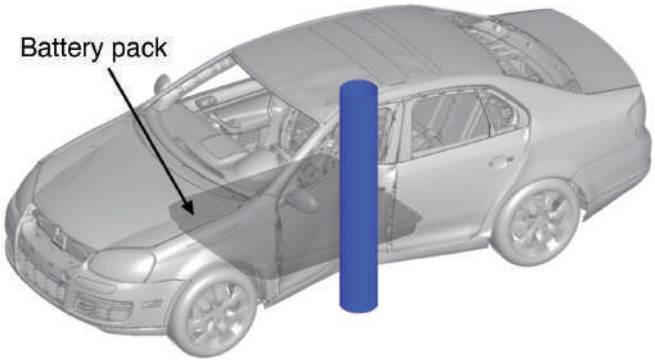
JFE Steel Corporation and Suzuki Motor Corporation are jointly developing lighter-weight electric vehicles (EVs) utilizing JFE's Topology Optimization Technology and high tensile strength steel sheets. EVs require a battery pack and body structure to protect the battery cells in the event of a collision. While aluminum is generally used for the structural parts, sheet thickness must be increased to ensure strength, posing a challenge to reducing the weight of battery protection components.

Therefore, JFE and Suzuki Motor started developing a battery-protected body structure consisting solely of steel sheets to reduce weight by optimizing the body structure. JFE's Topology Optimization Technology was used to design the battery protection parts to evaluate crash performance in the event of a pole side-impact, where the load on the battery is particularly high. The optimal use of various types of ultra-high strength steel sheets in the structural parts enabled a significant weight reduction for the battery-protection parts while satisfying crash performance without using aluminum.

JFE's Topology Optimization Technology incorporates the design space (space where the parts are placed) as a part of the vehicle body for analysis and can accurately reflect the load transfer to each part of the vehicle body structure. This makes it possible to effectively improve crash performance with less weight compared to the usual practice of optimizing each individual part. This is the first time the technology has been applied to the optimization of a battery-protected vehicle body structure made with steel sheets.

To provide solutions that help customers save process labor and improve product performance, we have systematized our automotive steel sheet utilization technology as JESOLVA® and are actively engaged in EVI* activities to engage in technical collaboration with our customers from the automotive design stage.

■ **Image of pole-side impact**



* Early Vendor Involvement: Participating in the manufacturer's development of a new automobile model from the early design stage, and proposing and developing steel materials, parts processing methods, performance evaluation, and other aspects tailored to the concept of the new model.

➤ **Collaboration with Suzuki Motor on Reducing the Weight of EVs (Japanese only)**
(https://www.jfe-steel.co.jp/release/2021/11/211111.html)

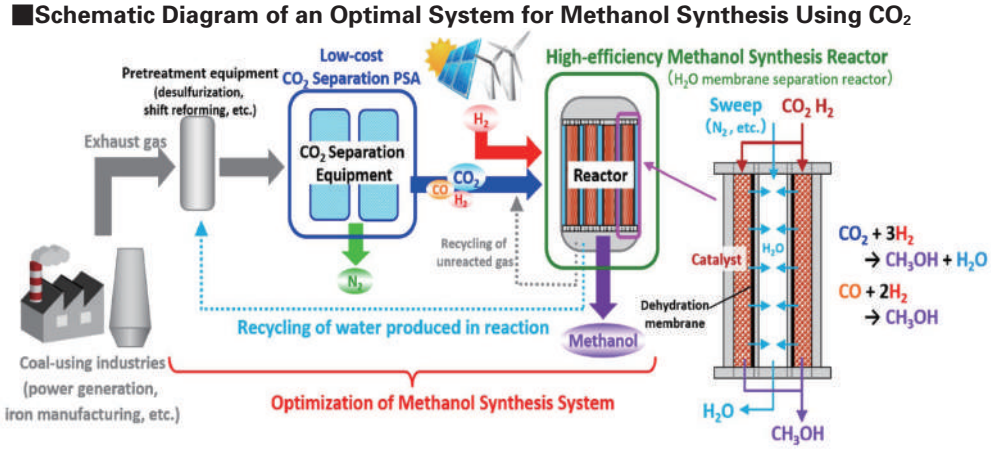
Novel Processes for Manufacturing Valuable Materials Using Coal-Derived CO_2 (NEDO Commissioned Project)

Two of JFE Steel's R&D projects for the research and development of novel processes to manufacture utilizable materials using CO_2 emitted from coal-using industries have been selected by the New Energy and Industrial Technology Development Organization (NEDO) of Japan for its publicly solicited project "Development of Technologies for Carbon Recycling and Next-Generation Thermal Power Generation/Development of Technologies for CO_2 Reduction and Utilization." The objective of the R&D is the massive reduction of CO_2 emissions through measures such as effectively utilizing by-products such as combustible gas from blast furnace gas and slag produced in the manufacturing of iron. In the steelmaking process, by-products such as combustible gas including blast furnace gas and slag are generated. In this R&D project, we intend to effectively use these byproducts to significantly reduce CO_2 emissions in collaboration with the Research Institute of Innovative Technology for the Earth (RITE) and Ehime University.

R&D (1) Development of Optimum System for Methanol Synthesis Using CO_2
Collaborator: RITE

We are developing an effective process for using CO_2 contained in the exhaust gas of steel mills and other facilities to synthesize methanol, a basic chemical. Blast furnace gas from ironworks has a relatively high concentration of CO_2 and contains CO and H_2 as secondary components. We will fully leverage these characteristics to lower cost and raise the efficiency of ethanol synthesis. In this project, we will advance the development of technology for low-cost CO_2 separation by pressure swing adsorption (PSA)* and technology for an H_2O membrane separation reactor that enables high-efficiency methanol synthesis from CO_2. At the same time, we will strive to construct an entire optimal system including pretreatment equipment and the recycling of water produced in the reaction when methanol is synthesized.

■Schematic Diagram of an Optimal System for Methanol Synthesis Using CO_2



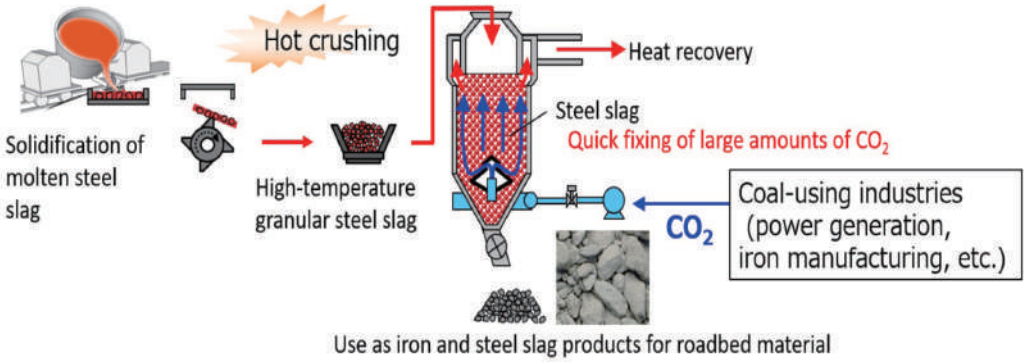
R&D (2) Research and Development of Innovative CO_2 Fixing Technology through Quick, Large-quantity Carbonation of Steel Slag
Collaborator: Ehime University

With the aim of fixing large amount of CO_2 in a short amount of time, we will develop an innovative technology to convert calcium oxide in steelmaking slag, which is a by-product of steel production, into carbonates by blowing CO_2 emitted from coal-using industries into high-temperature steelmaking slag. At the same time, by recovering the heat of the gas after CO_2 fixation, energy efficiency will be improved and the amount of CO_2 fixation and reduction is maximized throughout the process. We aim to use the steel slag converted to carbonates for roadbed material, which is in high demand.

* A method of gas separation using a phenomenon in which the amount of gas adsorbed to a suitable material such as zeolite and activated carbon, changes depending on gas pressure.

➤ **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)

■ **Schematic Diagram of the Quick, Large-Quantity Carbonation Process for Steel Slag**



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 therefore is able to prevent dredged soil from dissipating into the surrounding area and having a negative environmental impact placed in water.

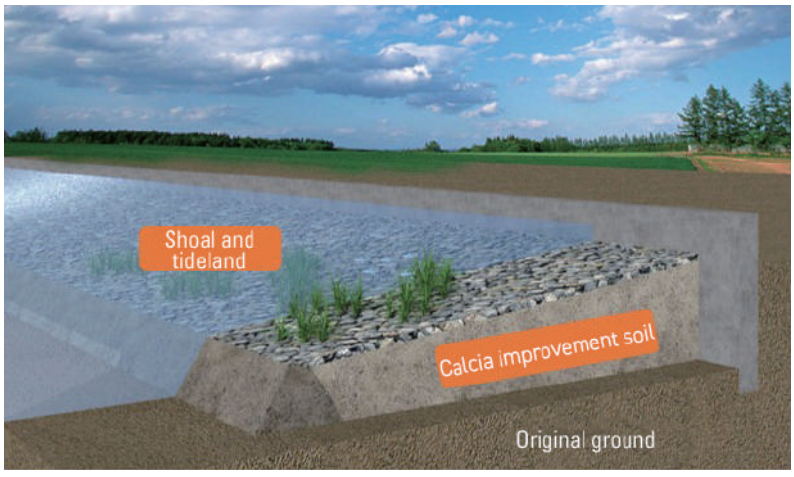
This enables the effective use of weak dredged soil in land reclamation, shoal and tideland construction and refilling former dredging sites.

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 (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**

Dredged soil | Calcia improvement material | 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, uses less cement and in turn reduces 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 onsite monitoring in the Katsunan Central Zone in 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 has been 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 (SIP), 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 Emission

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 hence lower CO_2 emissions. For example, producing one 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 Emission for Producing 1 Tonne of Cement (Unit: kg-CO_2 / ton)

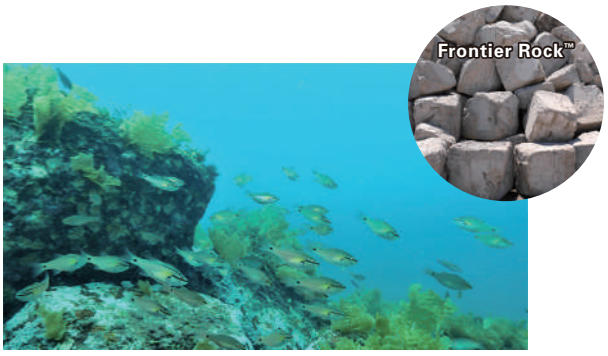
CO_2 Emissions Source	Regular Cement	Blast Furnace Slag Cement
Limestone	479	271
Electricity/energy	284	169
Total	763	440

Restoring Marine Ecosystems Using Steel Slag Products and Tackling Blue Carbon

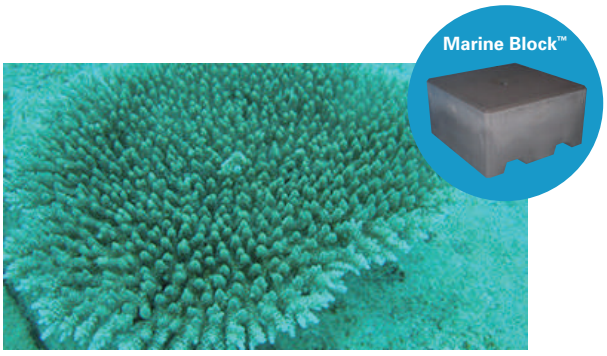
Marine Stone™ is a grain-size-adjusted steel slag with the function of controlling the generation of hydrogen sulfide from the silty sediment in enclosed coastal seas and improving the environment where organisms can live. Its effectiveness in improving marine environments has been widely recognized, 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 bed and fishing reef. 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.

In addition, we are focusing on blue carbon (carbon absorbed and fixed by marine organisms), which is an actively researched field in recent years. We are involved in creating seaweed beds using steel slag products, measuring the amount of carbon absorbed by the seaweed beds and testing Marine Block™ as beds for corals.



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



Coral growing on Marine Block™

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 methods for the carbon-neutral era. The Collaborative Research Laboratory will provide a system for encouraging collaborations in such areas as planning and promotion of joint research, human resource development, and university-launched ventures by establishing a center for collaboration with companies within the university and providing cross-departmental access to university faculty, knowledge, and facilities.

Under a collaborative agreement signed in 2017, JFE Steel and Tohoku University have been working together to resolve issues concerning themes such as the reduction of CO_2 emissions. In 2020, we established a collaborative research division to study advanced analytical technologies for steelmaking processes. 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 to the Circular Economy through its Businesses

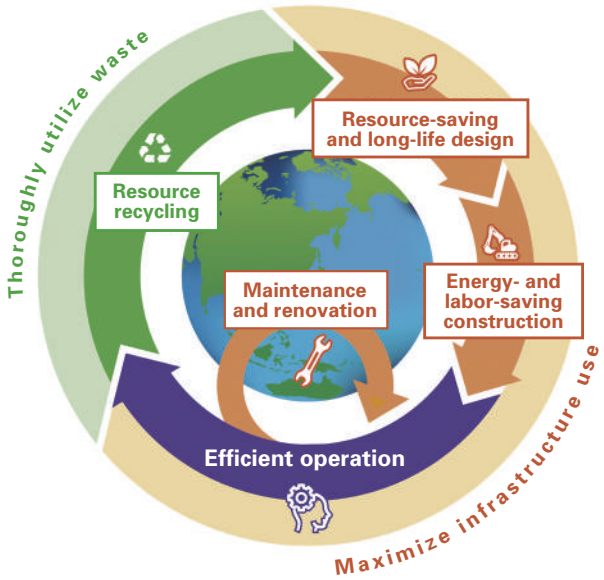
JFE Engineering offers a wide range of products and services to support infrastructure, including waste and renewable energy power generation plants, environmental plants that recycle food and plastics, water supply and sewage systems, and bridges. It is engaged in all parts of their lifecycles, from design and construction to operation, maintenance, and reconstruction.

Leveraging these complex businesses will support initiatives for the circular economy and carbon neutrality to realize a sustainable society.

In the area of developing a circular economy, JFE Engineering seeks to thoroughly use waste through its business of constructing and operating waste-fueled power generation and various recycling plants. In addition to these plants, it also focuses on maximizing the use of social infrastructure facilities including water supply and sewage systems and bridges through integrated implementation of resource saving, long-life design, energy and labor-saving construction, efficient facility operations, effective maintenance, and renovation.

Furthermore, we are working to realize a carbon-neutral society through the construction and operation of renewable energy power plants such as wind, biomass, and geothermal power plants, and through the development of CCU and other CO_2 capture and utilization technologies.

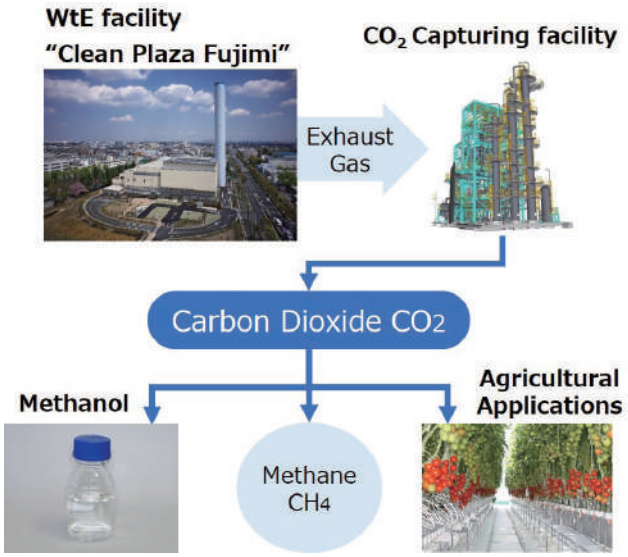
■ **JFE Engineering's Approach to a Circular Economy**



Realizing Carbon-Negative Processes through CO_2 Capture and Utilization Technologies (JFE CCU-Ready) for Waste-to-Energy Facilities

JFE Engineering launched verification tests in 2021 to assess the viability of the CCU process, which recovers and utilizes CO_2 from the flue gas emitted from wase-to-energy (WtE) facilities, to contribute to the establishment of Decarbonization Leading Areas advocated and promoted by the Ministry of the Environment of Japan. At present, we have achieved a CO_2 recovery rate of over 90%, and in February 2022, we succeeded for the first time in Japan in converting CO_2 recovered from the flue gas of a WtE into methanol in a joint demonstration project with Mitsubishi Gas Chemical Company, Inc. Waste materials such as household garbage and wood incinerated at the WtE are used to generate electricity and other energy, contributing to the formation of a recycling-oriented society. In particular, materials of biological origin, such as wood, absorb CO_2 from the atmosphere as they grow, a carbon-neutral property that reduces CO_2 emissions to zero. So, introducing this carbon capture technology makes it possible to achieve carbon negativity, where more CO_2 is absorbed and recovered than emitted. In the future, in addition to methanol, which is the basis for chemical products, we will propose the latest technologies for effectively using CO_2, such as the generation of methane gas for fuel and its use in the photosynthesis of agricultural crops.

■ **Overall flow diagram of CO_2 utilization system**



Contribution to Realizing Carbon Neutrality through Hydrogen and CO_2 Transportation

As a pioneer in pipeline construction, JFE Engineering has an extensive track record in the design and construction of transportation facilities for diverse fluids such as gas, oil, water, and steam. We are utilizing this wealth of experience and achievements to accelerate new initiatives in various fields related to the infrastructure for producing, transporting, and supplying energy toward the realization of carbon neutrality.

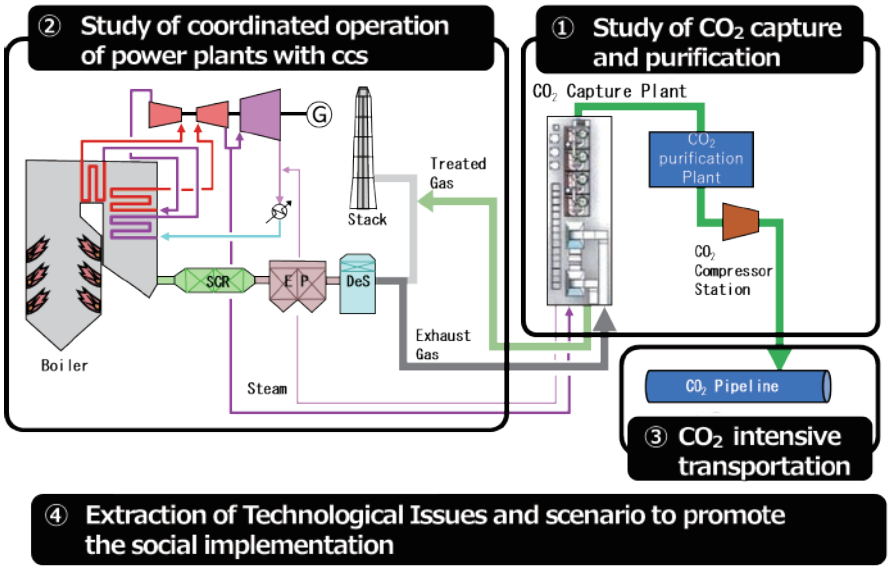
As part of this effort, we have joined the Chubu Region Hydrogen Utilization Council, which is studying the large-scale utilization of hydrogen for establishing a supply chain to handle increased demand and ensure stable utilization of hydrogen in the Chubu region. The council was established in March 2020 by leading companies from various industries, including oil, gas, electricity, and other energy sources, as well as petrochemicals, automobiles, and finance, to support the public implementation of hydrogen use in the Chubu region in 2025 and commercialization in 2030. This is the first initiative of its kind in Japan involving cross-industry initiatives. Within the council, JFE Engineering will play the role of clarifying technical conditions and issues and formulating plans for the establishment of a hydrogen delivery supply chain, including pipelines that connect large receiving terminals with industrial sectors and regions.

Along with Hokkaido Electric Power Co., Inc. and IHI Corporation, JFE Engineering was also commissioned by the New Energy and Industrial Technology Development Organization (NEDO) to take part in a project for the social implementation of CCUS, titled "CCUS Research and Development / Demonstration Project / Research related to CCUS Technology / Feasibility Study related to Separation, Capture, Concentration and Use of CO_2 from a High-Volume Source." The purpose of this project is to study and clarify issues related to CO_2 separation and capture technologies from large commercial coal-fired power plants and aggregation technologies to make the recovered CO_2 available for use. In this context, JFE Engineering will work toward establishing safe and efficient CO_2 mass transportation technologies.

In this way, we will contribute to the realization of a decarbonized society by providing hydrogen and CO_2 transport technologies using pipelines.

Gas transportation pipelines

■ **Technical Research Project for the Separation, Collection, and Aggregation of CO_2**



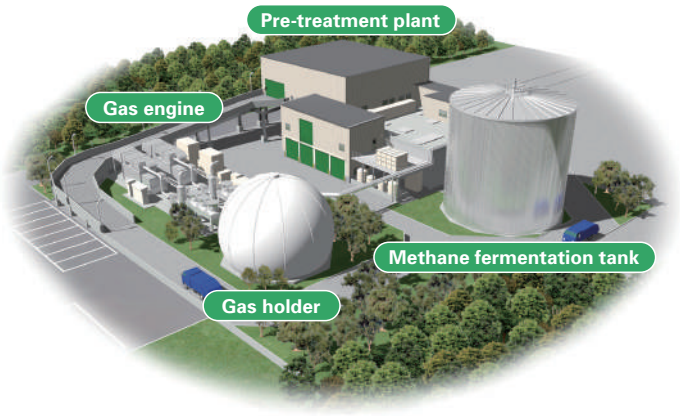
Food Waste Recycling Business

J&T Recycling Co., a subsidiary of JFE Engineering, is engaged in the food waste recycling business, in which food waste is collected and fermented to produce methane gas which is then used as fuel to generate power.

The company will promote its food waste recycling business and contribute to the expansion of renewable energy supply through J Bio Food Recycle Co., Ltd., which was established in 2016, Sapporo Bio Food Recycle Corporation (located in Sapporo-city, Hokkaido, acquired in 2019), Tohoku Bio Food Recycle Corporation (located in Sendai-city, Miyagi, established in 2019 jointly with East Japan Railway Company, Tokyo Gas Co. Ltd., and Tohoku Railway Transportation Co. Ltd.), and Bios Komaki Co. Ltd. (located in Komaki-city, Aichi, acquired in 2020).

Company Name	Volume of Food Waste Processed	Estimated Amount of Electricity Generated (Annual)	Notes
J Bio Food Recycle Co., Ltd.	80 tonnes per day	11,000 MWh	In operation
Sapporo Bio Food Recycle Corporation	68 tonnes per day	1,600 MWh (2021 actual data)	In operation, also engaged in feed and fertilizer production from food waste
Tohoku Bio Food Recycle Corporation	40 tonnes per day	6,500 MWh	Scheduled to start operation in FY2022
Bios Komaki Co. Ltd.	120 tonnes per day	9,200 MWh	Scheduled to start operation in FY2022

■ Biogas (methane gas) power generation facility

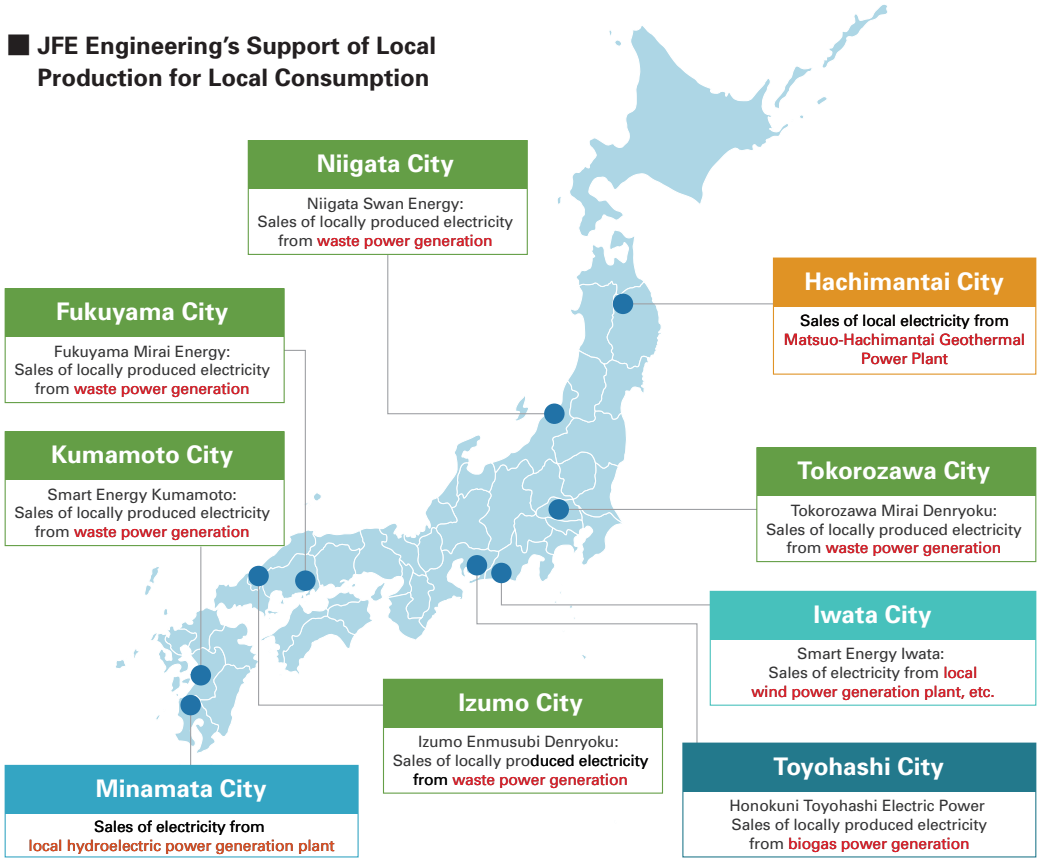


Regional Electricity Retail Businesses in Partnership with the Local Municipal Governments through Developing New Regional Electricity Businesses

JFE Engineering has established several regional electricity retail companies in partnership with local municipal governments. It is actively involved in the regional electricity business, with a particular focus on the distribution of renewable energy.

JFE Engineering is establishing frameworks for effectively using renewable energies such as hydropower and geothermal energy in regions and for supplying electricity from renewable energy plants constructed by JFE Engineering, such as waste-fueled, to regional public facilities. Through these efforts, JFE Engineering is supporting local production and consumption of electricity. These regional electricity businesses promote the use of renewable energy and decarbonization of the region while also reducing administrative costs and enhancing the region's industrial infrastructure.

■ JFE Engineering's Support of Local Production for Local Consumption

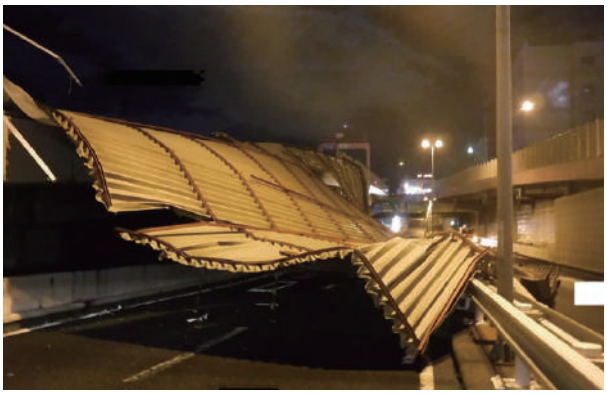


Infrastructure Construction for Strengthening the Resilience of National Land

JFE Engineering is pursuing initiatives to prevent global warming by promoting carbon neutrality through a variety of projects and measures, as well as contributing to strengthening the resilience of Japan's national land.

In the past, we addressed the social challenge of improving national land infrastructure through the construction of bridges and coastal structures. In recent years, the emphasis has been placed on efforts to realize a sustainable society and respond to the need to extend the service life of existing structures. In addition to repair and reinforcement to address structural damage and aging, significant reconstruction and remodeling are required in response to changing public needs to ensure lasting use of the existing national infrastructure stock. Construction work for extending the service life of a structure depends upon considering the different conditions that apply to each project, such as planning and design that take into account the existing structure and surroundings, on-site construction work, and maintenance after completion.

JFE Engineering has carried out many such works to extend the service life of structures. In addition, by utilizing the technology cultivated through these achievements, we have contributed to addressing climate change as well. For example, we have minimized the impact of typhoon damage by quickly removing and restoring roofs, signboards, and other components of neighboring buildings that had been blown onto a highway closed during a typhoon. We are promoting these contributions to strengthen the resilience of national land and support daily life.



Emergency repair of damage caused by Typhoon No. 19 on the Metropolitan Expressway Yokohane Route in 2019
(Left: Damage situation Right: Restoration work)

➤ **Adapting to Climate Change** (P. 75)
➤ **Climate Change Scenario Analysis** (P. 84)

JFE Shoji

Further Expansion of the Global Supply Chain for the Steel Sheets Business

The key factor in initiatives for countering climate change, including those aimed at reducing CO_2 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 that would contribute to the equivalent of a 500,000 kW-class power generation plant in energy savings. Technological advances are expected in electrical vehicle's engine motors, for which demand is expected to rise as we transition to a decarbonized society, and in various types of motors for cars, which could be as many as 50 to 100 motors per vehicle. We also 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 is required in transformers, where the most loss of electricity occurs, to make them more efficient.

JFE Shoji has established a stable global supply chain that sources high-quality electrical steel sheets which are essential for improving the efficiency of motors and transformers from JFE Steel and other manufacturers and processes 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 itself to 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. The Seventh Medium-term Business Plan calls for establishing the world's number one global distribution and processing system for high-quality electrical steel sheets, and in fiscal 2021, the first year of the plan, we took actions such as strengthening the capabilities of regional processing centers and investing in an EV motor development company in North America. By further expanding its supply chain and processing capabilities and collaborations with alliance companies, JFE Shoji is striving for significant improvements in the distribution and processing of electrical steel sheets.

Building a Supply Chain for Steel Materials and Processed Products for Offshore Wind Power Generation

Many countries are expanding their efforts to achieve carbon neutrality, and the use of renewable energy including wind power is seen as a key factor. In Japan, Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities was enacted in 2019, and an environment for commercializing offshore wind power generation is being established. The Japanese government has announced plans to increase the share of offshore wind power in its power supply mix from 0.7% in FY2019 to 1.7% in FY2030, and the number of offshore wind power construction projects is expected to increase. Other Asian countries are also announcing offshore wind power projects.

The JFE Group will be a forerunner in the field of offshore wind power generation and will establish a supply chain that leverages the Group's collective strengths in the business of constructing foundation structures for wind towers and in their O&M.

JFE Shoji focuses on building a supply chain for various components used in offshore wind power both in Japan and overseas. In Taiwan, which is leading in the offshore wind power generation market, we have been collaborating with a local enterprise that manufactures equipment and accumulating experience in the supply chain of steel materials for offshore wind power. Looking ahead, we will contribute to the spread of renewable energy by establishing a supply chain that contributes to the local economy and meets customer demand in the offshore wind power generation business in Japan.

Expanding Business in Biomass Fuels

In response to growing demand for biomass fuels by biomass power generation companies, JFE Shoji imports palm kernel shells to Japan from Malaysia and Indonesia. Furthermore, amid the growing need for decarbonization, demand for renewable energy is rising, especially for biomass power generation which is not affected by weather conditions. We will respond to this demand by exploring other types of biomass fuels, such as wood pellets, to ensure a stable supply of biomass fuels. Wood pellets are a woody biomass fuel that effectively uses waste wood such as thinned and pruned timber generated in the process of growing forests and scrap wood from lumber mills.

We will continue to supply fuel to biomass power generation companies, including JFE Engineering, and do our part in the JFE Group's overall contribution toward realizing an eco-friendly society.

PKS

Wood pellets

Expansion of Scrap Trading Helps in the Development of a Recycling-oriented Society

JFE Shoji's recycling business for steel and aluminum scrap includes the export of steel scrap to Asian countries, where it is sold for both offshore and domestic trading. Although steel scrap exported from Japan is mainly transported by bulk carriers in general, timely shipments of small lots is now also possible due to the container loading system introduced by JFE Shoji, contributing to the development of recycling-oriented societies in Asia.

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

Each JFE Group operating company carries out resource recycling suited to its particular business. We identified KPIs for material CSR issues and consistently met them every year up to FY2020. This effort enabled us to establish our environmental practices. We acknowledge that the efficient use of resources is a key environmental issue for manufacturers and therefore continue to set the following high-level targets and manage our achievements.

■ Targets and Results for FY2021 and Targets for FY2022

Operating Company	FY2021 Targets	FY2021 Results and Initiatives	FY2022 Targets
JFE Steel	Recycling rate of co-products: 99% or higher	Recycling rate of co-products: 99.7%	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: 99.4% ・Recycling rate of sludge: 96.9% ・Recycling rate of industrial waste: 81.6%	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	98.8%	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: –20% from FY2020	Global recycling of steel scrap ・Exceed FY2020 scrap trade volume (FY2024 target: +5% from FY2020)

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

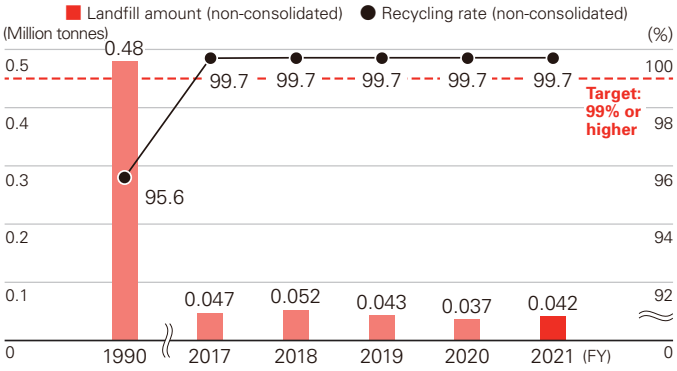
JFE Steel

JFE Steel carefully controls the generation and emission of iron and steelmaking slag (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. We are also promoting their 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 such efforts, the company accomplished a 99.7% recycling rate for slag, dust, and sludge in FY2021. Furthermore, it has consistently maintained the target of 99% or higher and will continue to achieve the target going forward.

Landfill of Co-products and Recycling Rates



Group companies*	Amount released	—	0.539	0.792	0.546	0.513	0.504	(Million tonnes)
	Amount transferred	—	0.034	0.029	0.031	0.023	0.054	(Million tonnes)

*23 JFE Steel consolidated subsidiaries in Japan.

For more on quantitative data related to co-products, please refer to the following information.

➤ Environmental Data (P.207)

Promoting Recycling

JFE Engineering

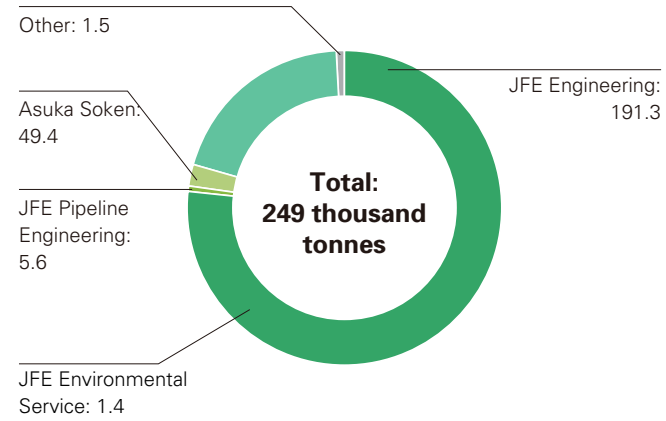
Most of JFE Engineering's waste is either rubble and sludge discharged from construction sites or industrial waste discharged by the Tsurumi and Tsu works.

We are promoting reduction of industrial waste as well as resource recycling through various measures, which include setting environmental goals for recycling rates and properly separating the waste onsite before sending it to disposal companies known for achieving high recycling rates. We also address the Plastics Resource Circulation Act, enforced in Japan in April 2022, by including initiatives for plastics recycling in our environmental target.

The Yokohama head office sets target recycling rates for office recyclable waste and has been certified as a "Workplace with Excellent 3R Activities" by the City of Yokohama every year since FY2012 for 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).

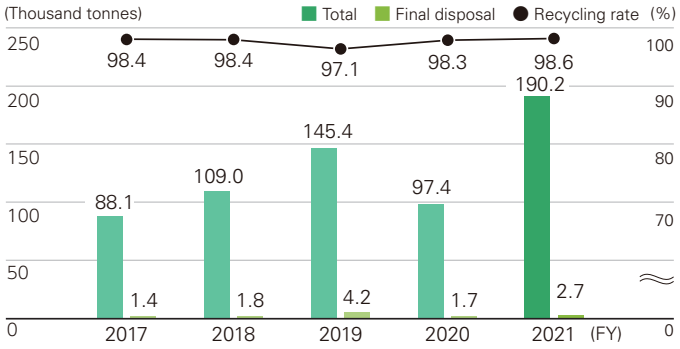
The JFE Engineering Group is also working to realize a recycling-oriented society through its PET bottle and food waste recycling initiatives.

JFE Engineering Group Waste Disposal for FY2021



Data cover JFE Engineering and 12 consolidated subsidiareisin Japan.

Waste Generated at Construction Sites



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

➤ **Environmental Data** (P.207)

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 are 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 products that contribute to addressing the issue of plastic waste.

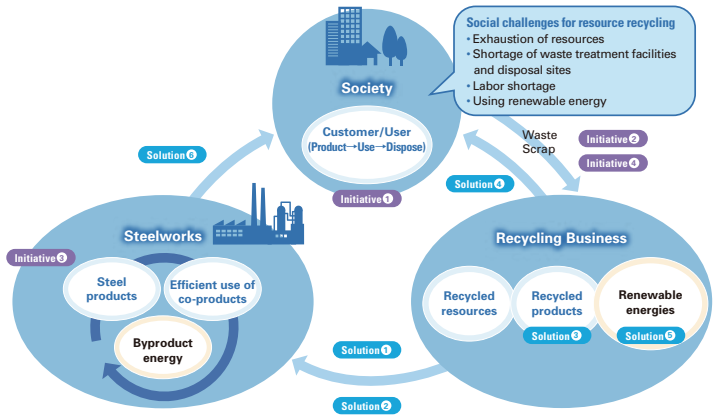
In the engineering field, we produce biomass fuel from food waste and sewage sludge, constructing plants, and other infrastructures for waste power generation and offer resource recycling solutions by operating these facilities directly or under contract. In addition, we are pursuing a circular economy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

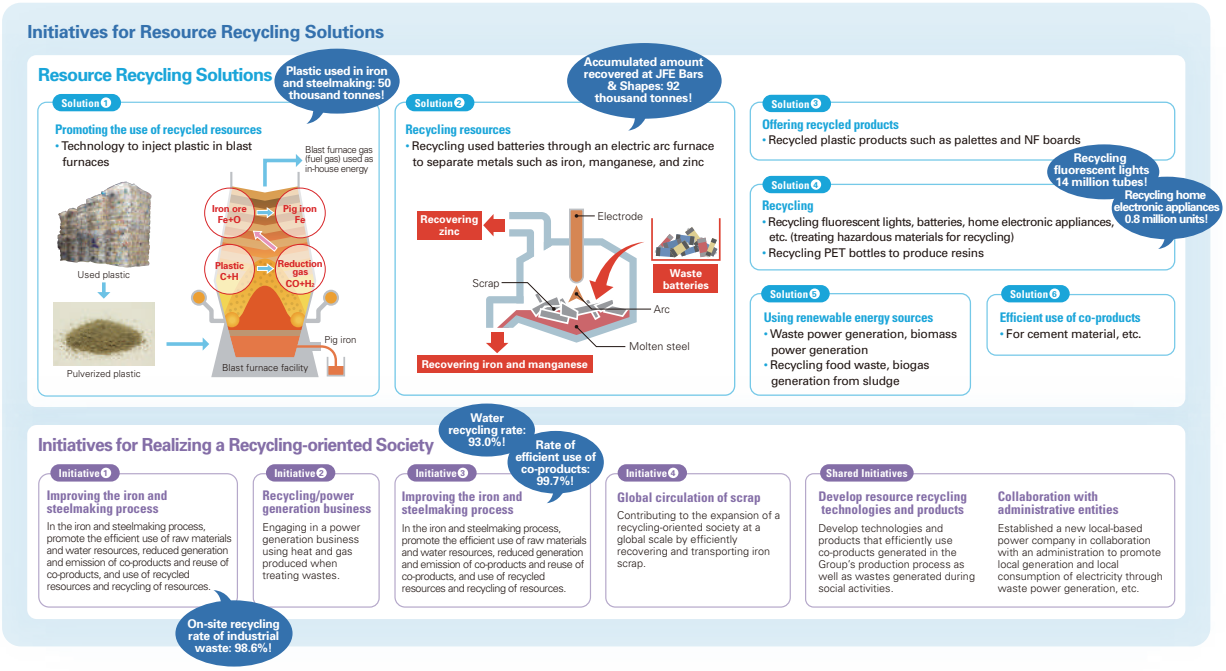
For JFE Steel and JFE Engineering's recycling businesses, please refer to the following information.

➤ 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. 100)
➤ Environmental Communication (P.138)





BETTER RECYCLE Shonan

— Containers developed to help address plastic waste, leveraging the highly recyclable quality of iron

JFE Steel promotes the BETTER RECYCLE Shonan project, launched to tackle plastic pollution by developing new uses for steel sheets for can-making. This new approach for solving the problem focuses on the single use of plastic containers together with consumers by developing new products and proposing new lifestyles. A project team was created with members from IBLC Co., Ltd. and *Shonan Style* magazine (published by EDITORS Inc.). Carrying out activities around the Shonan area, the project team received the cooperation of local governments and take-out container suppliers as it formulated the concept of a BETTER RECYCLE CUP prototype, an environmentally sound, steel drinking container. Discarded plastic containers used to take out food and beverages are difficult to recover as raw materials and recycle into plastic products. Steel containers, however, can be recycled as ironware owing to iron's high recyclable quality, which supports an environmentally sound lifestyle. Furthermore, taking advantage of iron as a material, containers have required strength as well as the cooling effect of iron's high thermal conductivity, and a posh design.

Since the end of October 2021, we have been test-marketing BETTER RECYCLE CUP and holding exhibitions to introduce iron's high recyclability and the project's work. These events are helping us understand the needs of users in developing new products coming out in the next three to five years, as we try to meet the needs of society and customers through the use of iron and contribute to achieving the SDGs.

➤ **BETTER RECYCLE Shonan (Japanese only)** (https://www.jfe-steel.co.jp/products/can/pr/better_recycle_shonan.html)

Prototype of steel containers, BETTER RECYCLE CUP

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.

Targets and Results

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 acknowledge the use of water resources as a key environmental issue for manufacturers and will therefore continue to set the following high-level targets and manage our achievements.

■ Target and Result for FY2021 and Target for FY2022

Operating Company	FY2021 Target	FY2021 Result and Initiative	FY2022 Target
JFE Steel	Maintain efficient use of water Recirculated water usage rate: at least 90%	Recirculated water usage rate: 93%	Maintain efficient use of water Recirculated water usage rate: at least 90%

Risk Management 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 JFE Group Environmental 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.

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

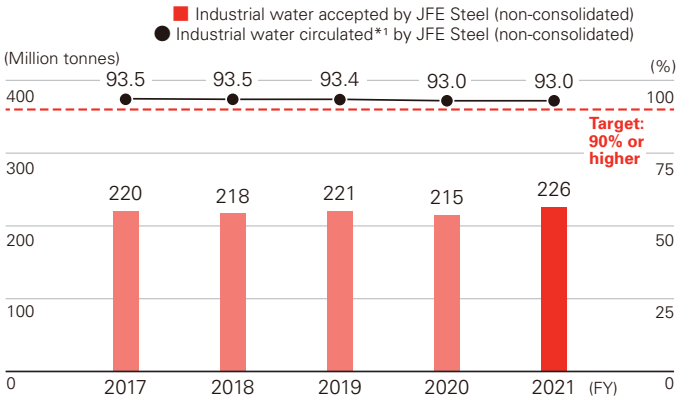
JFE Steel identifies and evaluates water-related risks based on past incidents of damage caused by droughts and floods, forecast data from the Meteorological Agency and results of scenario analysis. We conduct a further evaluation of water risks around each manufacturing site from different perspectives 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 August 2022, 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 FY2021 maintained a high level of 93.0%.

■ Industrial Water Accepted/Circulated



JFE Steel

Total amount	3,410	3,376	3,323	3,066	3,207	(Million tonnes)
Industrial water accepted	220	218	221	215	226	(Million tonnes)

Group companies*2

Total amount	280	289	293	265	235	(Million tonnes)
Industrial water accepted	21	20	20	21	19	(Million tonnes)

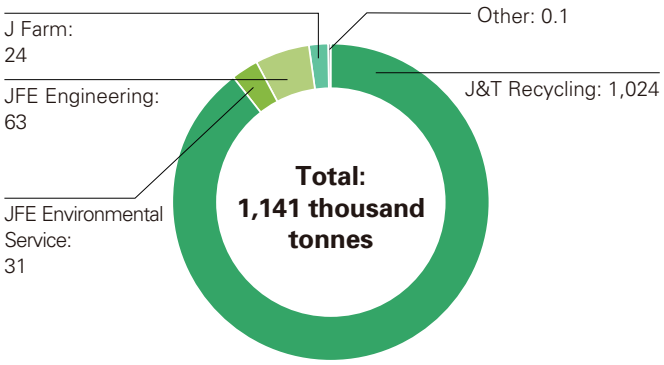
*1 Industrial water circulated (%) = (Total amount used – industrial water accepted)/total amount used ×100

*2 23 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 FY2021



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.207)

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.

Targets and Results

The JFE Group has developed KPIs for material CSR issues relating to air pollutants generated from the steelmaking process based on the action plan formulated by the Japan Iron and Steel Federation and we consistently met them every year. This effort enabled us to establish environmental practices. Acknowledging the prevention of pollution as a key environmental issue for manufacturers, we will continue to set the following high-level targets to maintain the emission of pollutants at low levels and prevent environmental pollution.

■ Targets and Results for FY2021 and Targets for FY2022

Operating Company	FY2021 Targets	FY2021 Results and Initiatives	FY2022 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: –65% from FY2000 (542 t)	VOC emissions: –30% from FY2000 (1,078 t or less)
	Benzene emissions: –80% from FY1999 (46 t or less)	Benzene emissions: –93% from FY1999 (16 t)	Benzene emissions: –80% from FY1999 (46 t or less)
	Dichloromethane emissions: –40% from FY1999 (46 t or less)	Dichloromethane emissions: –61% from FY1999 (30 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: 127.8 Nm^3 (18,000 Nm^3) •SOx: 34.3 Nm^3 (100 Nm^3)	Continue efforts to keep NOx and SOx emissions at low levels

Management System

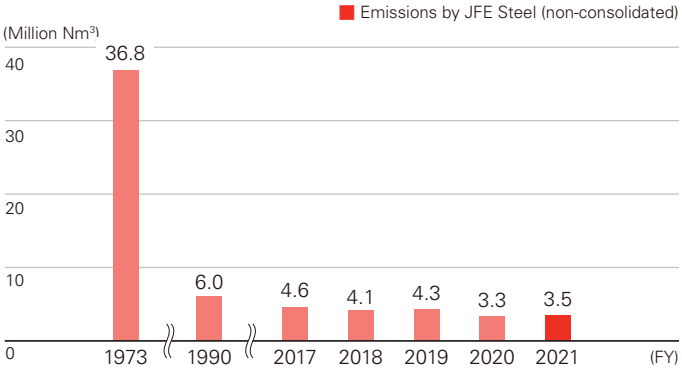
The JFE Group works to reduce environmentally hazardous substances generated from its business activities, takes actions to keep air, water, and other resources clean, and manages these matters Group-wide. In addition to management and supervision carried out by specialized committees set up at each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

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.

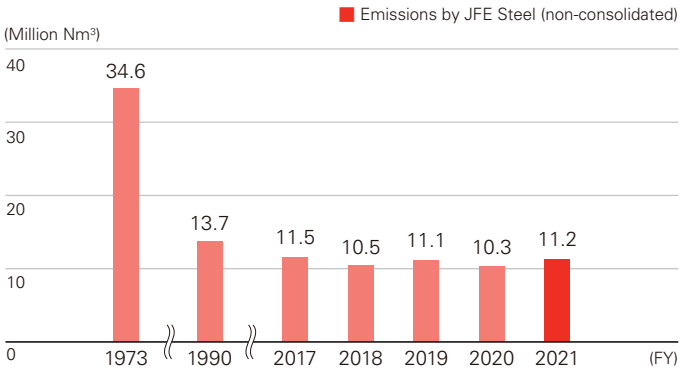
SOx Emissions



	1973	1990	2017	2018	2019	2020	2021	
Group companies*	—	—	0.05	0.04	0.04	0.03	0.03	(Million Nm³)

* 11 JFE Steel consolidated subsidiaries in Japan.

NOx Emissions



	1973	1990	2017	2018	2019	2020	2021	
Group companies*	—	—	0.20	0.19	0.17	0.14	0.18	(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

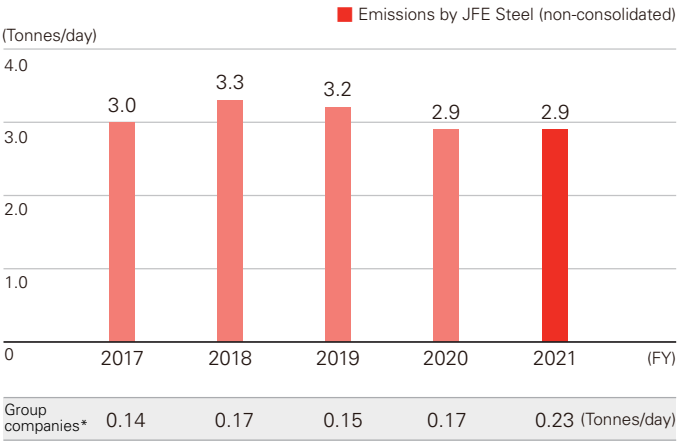
the use of construction machinery and on-site vehicles in compliance with the Automotive NOx and PM Law and Act on Regulation, Etc. of Emissions From Non-road Special Motor Vehicles (Off-Road Vehicle Law).

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 FY2021, chemical oxygen demand (COD), the water-quality index for wastewater, was 2.9 tonnes per day.

Chemical Oxygen Demand (COD)

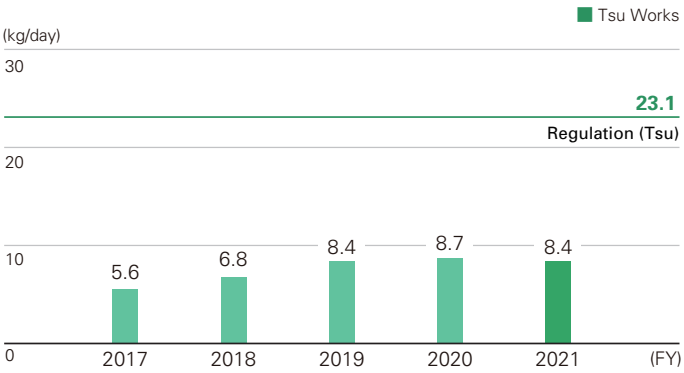


* 11 JFE Steel consolidated subsidiaries in Japan.

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



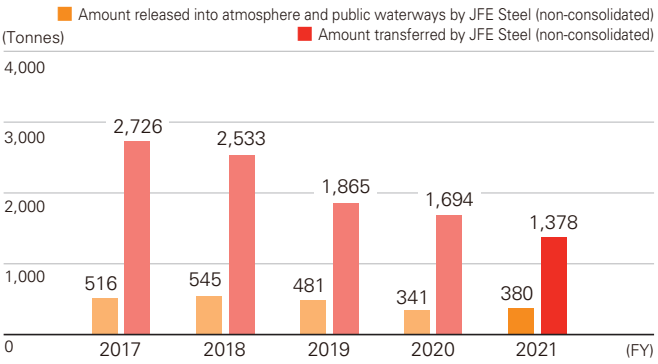
This report uses the maximum value of each year.

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 FY2021, chemical substances released into the atmosphere and public waterways totaled 380 tonnes.

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



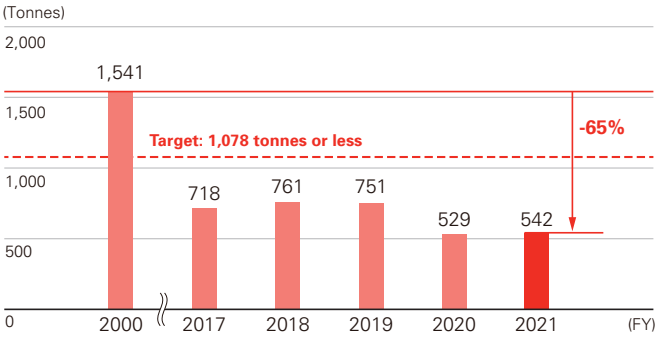
		2017	2018	2019	2020	2021	
Group companies*	Amount released	381	269	285	255	292	(tonnes)
	Amount transferred	6,208	6,643	5,967	4,216	8,433	(tonnes)

* 16 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.

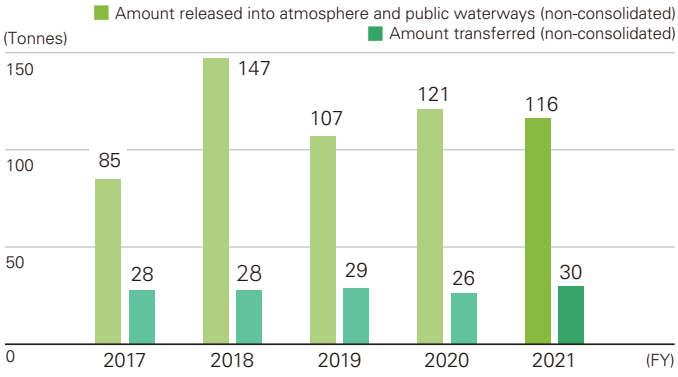
VOC Emissions



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



		2017	2018	2019	2020	2021	
Group companies*	Amount released	—	58.4	45.4	36.7	39.3	(tonnes)
	Amount transferred	—	5.7	5.4	12.5	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.207)

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 and Mizushima Eco-Works of J&T Recycling Corporation treat insulating oil contaminated with slight amounts of PCB, helping to reduce pollutants both in and outside the JFE Group.

Biodiversity

Basic Policy

The JFE Group recognizes biodiversity preservation as a key challenge and conducts assessments to minimize the ecological impact from 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. The Group is also involved in developing iron and steelmaking slag products that can help restore the marine environment. Furthermore, outside of our business operations, we launched a joint research program with the local government and are conducting environment-related education for local communities.

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)

While the seaside frontage of Yamashita Park in Yokohama City, Kanagawa Prefecture, maintains a healthy environment in shallow areas, silty sediment (sludge that contains large amounts of organic matter) piles up at the ocean bed, causing water quality to significantly deteriorate in summer. As a result, the ocean's function as a spawning ground or environment for nurturing organisms has been lost.

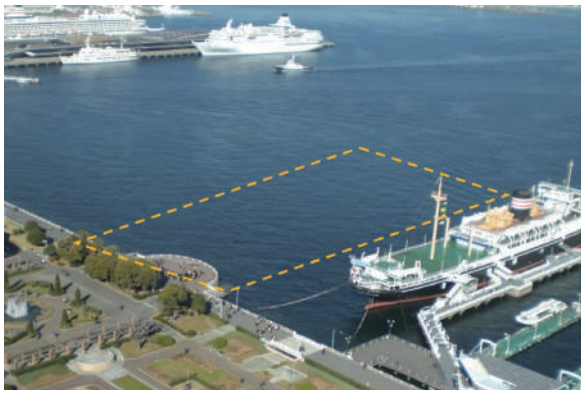
In a joint research project with Yokohama City, JFE Steel is trying to restore the intrinsic ability of the waters, which is to purify seawater with the help of marine organisms, by using steel slag products such as Marine Block™ that has absorbed CO_2 gas. We used these products to form shorelines as a base for the adhesion of organisms and contribute to improving the marine environment. Immediately after the start of the experiment, we confirmed the increasing presence of marine organisms such as starfish and sea cucumbers around the area over time. We estimated that filter-feeding marine creatures such as bivalves and sea squirts filter about 8,400 kL of sea water daily, an amount that can fill a 25 m swimming pool 17 times. We also calculated its effectiveness in reducing environmental impact compared to chemical oxygen demand (COD)*1 and sewage treatment plants, based on the amount of CO_2 reduced.

We introduced these successful approaches a number of times through environmental education offered to the neighborhood residents and contributed to raising public awareness. This initiative to improve the marine environment was named "A 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" and jointly awarded the 2021 Environmental Award (Group-2) by the Japan Society of Civil Engineering*2. In September 2022, the company was selected as the winner of the Minister of Land, Infrastructure, Transport and Tourism Award for the 5th Eco Pro Award hosted by Sustainable Management Promotion Organization.

*1 An indicator of the level of pollution of ocean areas as well as lakes and marshes, which shows the amount of oxygen (mg/l) consumed when pollutants present in water, such as organic matter, are oxidized.

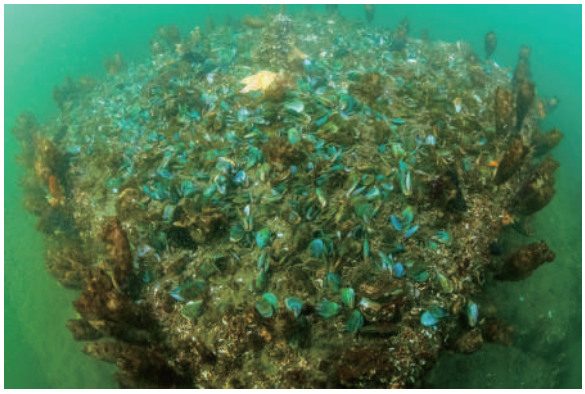
*2 The Japan Society of Civil Engineering Award is a prestigious award with a history of over 90 years. Environmental Award (Group-2) is given to an innovative project that has contributed to any combination of environmental preservation, improvement, and creation activities by developing or operating civil engineering technology or systems.

➤ **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 has started exhibiting a water tank containing the coral-covered steel slag product Marine Block™. The tank is placed at the exhibition area at the reception of the head office as a permanent installation, 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 introduced through various media, including newspapers and television, as an example of business collaboration in the field of the environment.

*A venture company engaged in developing systems to manage and nurture organisms such as coral, microorganisms, and fish using the technologies of IoT and AI combined with the know-how of aquarists.

Coral growing well 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, through maintaining the watering holes and its 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

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 the 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 2021, 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.

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.

After the Japan Business and Biodiversity Partnership, which the Group had taken part in, ended in December 2021, the Group decided to participate 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:

➤ **The Keidanren Biodiversity Conservation Initiative** (http://www.keidanren-biodiversity.jp/logo_en.php)

➤ **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.100)

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

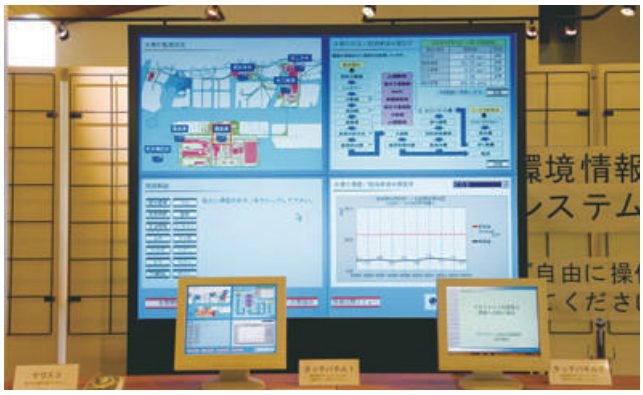
Environmental Communication

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.

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

Disclosure and Exchange of Information

“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.

The summer 2022 issue featured the JFE Steel-led “BETTER RECYCLE Shonan” project, which contributes to addressing plastic pollution by developing new uses for steel sheets for can-making, as an example of the JFE Group’s environmental and social contribution. The article introduced the initiative and the people involved, including employees and participating parties. The site also notes a variety of other initiatives focused on environmental themes. Please take a look at it to find out more.

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.

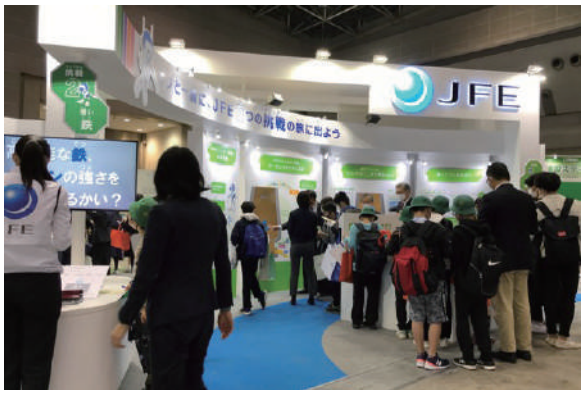
Please see the following for further details.

➤ **"Midori no Komichi" Environmental Diary (Japanese only)** (https://www.midorinokomichi.net/)

Participating in Environmental Exhibitions: EcoPro2021 and Online Tokyo Bay Festival 2021

In December 2021, the JFE Group participated in one of the largest environmental exhibitions in Japan, EcoPro2021, 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 contribute to reducing CO_2 emissions across society as a whole. 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.

We also participated in the Online Tokyo Bay Festival 2021 in October, an event for expressing gratitude for the marine blessings of Tokyo Bay. We introduced our environmental contribution in the restoration of marine environment and biodiversity through the use of steel slag products.



Many people came to the first on-site event after two years

Showing a video of steelmaking in the future that reduces CO_2

Crowds of children around the JFE Group's booth

Society: Executive Summary

The mission of the JFE Group is to establish its position as a company essential to society's sustainable development and to create safe, comfortable lives for people everywhere. Through our efforts to address social issues, such as by promoting diversity and respect for 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 accidents, we are bolstering our capital investments and safety education programs while also utilizing multifaceted occupational employee health and safety, including monitoring and detection, that incorporates advanced IT solutions.

To promote diversity, we are committed to empowering women in the workplace. To this end, we have set goals for increasing the ratio of female recruits as well as the number of female managers, and we are formulating Company-wide policies through discussions with management while implementing measures to create better workplace environments and systems for women.

We believe that respecting human rights is fundamental to our business activities and have been seeking cooperation from all our stakeholders to respect and protect human rights in accordance with the JFE Group Human Rights Basic Policy. In accordance with the United Nations Guiding Principles on Business and Human Rights, we began conducting human rights due diligence in FY2021 and are promoting efforts to ensure respect for human rights across our supply chain.

As we carry out our corporate activities globally, it is important for us to cooperate and collaborate with society, and by actively contributing to local 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.19)

Key Initiatives

- To achieve our goal of zero workplace fatalities, particularly **prioritize safety investments** (P.148) (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, including monitoring and detection, by harnessing advanced IT solutions** (P.148).
- Proactively promote **mental healthcare** (P.152) in addition to **maintaining and improving the mental and physical health of employees and their families** (P.150), such as by creating an environment that supports employee physical health and medical checkups for their spouses.
- Promote a **new workstyle** (P.158) by introducing teleworking and a flexible working hour program.
- Implement a broad range of initiatives **to support female employees**, such as increased hiring(P.162), enhanced childcare-support programs that significantly exceed statutory requirements, and training and education.
- Roll out **human rights due diligence** (P.168) and consider initiatives to identify and address human rights risks for the JFE Holdings and major Group companies during FY2021. Starting in FY2022, the scope will expand to include a human rights risk management system for suppliers and gradually introduce human rights due diligence to other Group companies.
- **Actively promote DX**(P.141), including the active introduction of IoT, AI, data science, etc., and the application of data assets .

Responsibility to Customers (Provide Quality Products and Enhance Customer Satisfaction)

Basic Policy

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 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 regard of customers by endeavoring to provide safe, high-quality products and services based on superior technology, and by fully respecting and protecting the privacy of personal and customer information. Also, leverage our superior technologies for the sustainable growth of the 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 (P.19)

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 being 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 reliability in its product testing, the company has introduced high-precision equipment and is working to thoroughly eliminate human error and data tampering by automating each process, from conducting tests that include providing instructions on testing and collating specimens to the delivery of test results.

Moreover, JFE Steel responds to customer demand by operating its quality management system based on ISO 9001 and by holding 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.

JFE Engineering

Products and services that JFE Engineering designs, procures, manufactures or constructs must comply with all required rules and regulations, and quality must satisfy the needs of our customers. Under this corporate policy, the company continually strives to improve the quality of its products and services.

For example, certified inspectors conduct inspections at each phase of a plant construction project, including the design, construction, and test-run phases. Immediately prior to final delivery to the customer, a witness inspection is conducted either in person or remotely so that the customer can be directly assured of its quality with their own eyes. In addition, JFE Engineering has published quality-management 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 it electronically stores all inspection data to reinforce 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 continues to strengthen 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 to 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

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 rate of automated testing and inspections.

Through these activities, it will stabilize facility operations as well as production and quality to continue providing high-quality products to customers.

JFE Engineering

JFE Engineering, designated as a special construction business operator under the Construction Business Act that undertakes mechanical, civil engineering, and building construction work, assigns 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 expenses 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. The company purchases iron ore and other main raw materials for steel from around the world and dispatches employees to such countries of origin as Australia, India, and Brazil to ensure a stable supply to customers. In its steel distribution operations, JFE Shoji 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

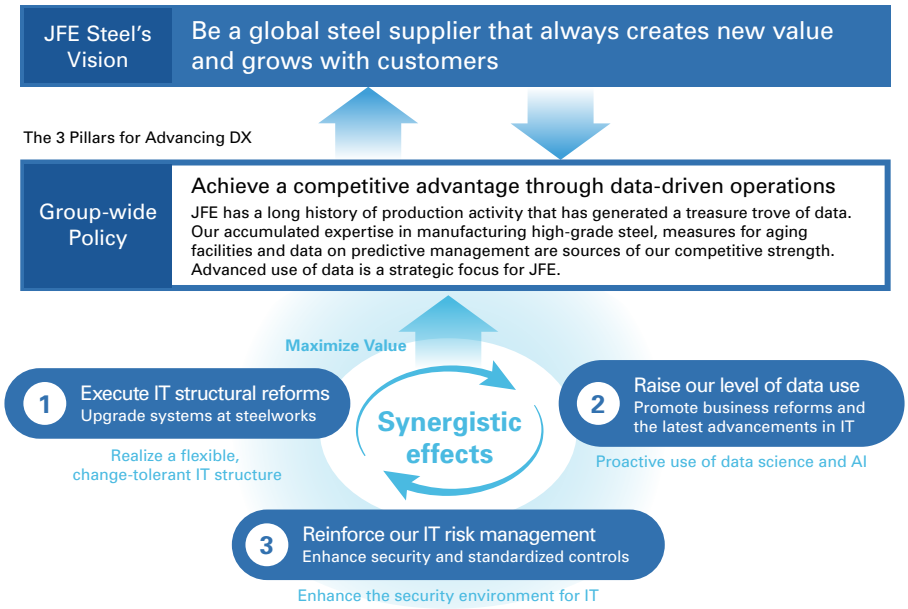
JFE Steel

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, the Steel Structural Materials Solutions Center (THiNK SMART) for infrastructure-related customers and the JFE Welding Institute -Center for Integrity against Fatigue and Fracture (JWI-CIF^2) 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.

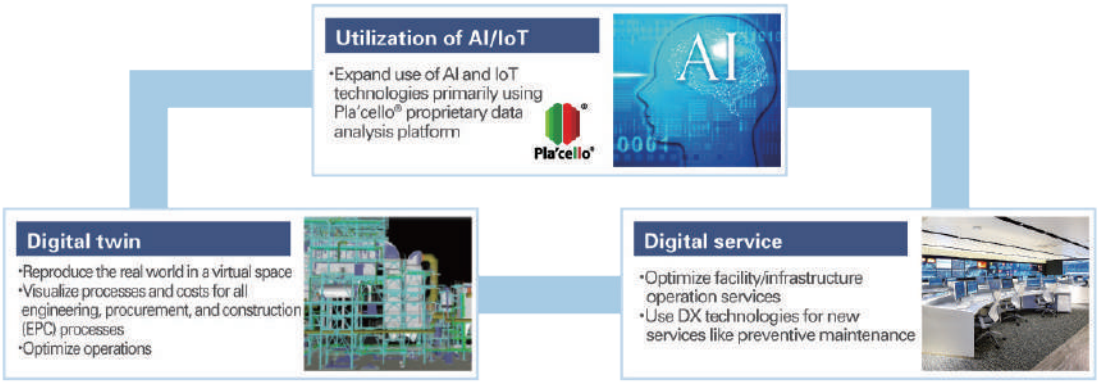
JFE Engineering

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.

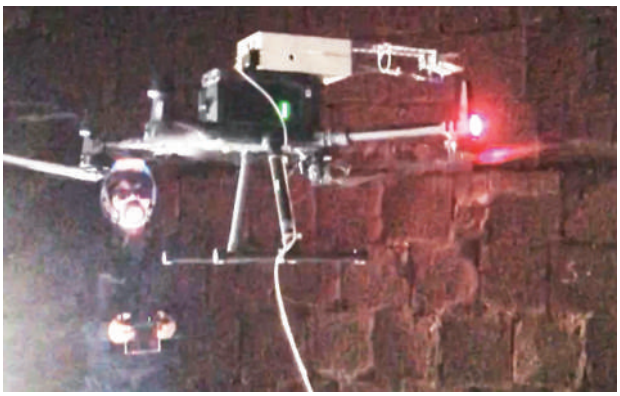
JFE Shoji

Meeting 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, and Osaka University have successfully conducted a demonstration experiment using a drone-mounted ultra-wideband radar system to measure the thickness of fire-retardant coating material inside a chimney without requiring physical contact. The company will accelerate its development for a wide range of applications across diverse fields, including industrial plants, construction, and infrastructure, while focusing on aging buildings and facilities that have been difficult to inspect and maintain by human operators due to their elevated locations.

JFE Shoji is also exploring ways to provide innovative value to customers in the steel supply chain through the use of DX.



For more details related to customers, please refer to the following information.

➤ Data on Training Related to Customer Care (P.225)

Promotion of Research and Development

JFE Steel

Under the Seventh Medium-term Business Plan, JFE Steel is promoting research and development of innovative technologies for the steel manufacturing process, 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 FY2021.

■ **Internal Awards (FY2021)**

	Prize/Award	Project	Recipient
JFE Steel	Grand Prize/Excellence Award, JFE Steel President's Awards	Establishment of the world's first technology to improve output elasticity of large-scale blast furnaces through DX	Ironmaking Department, West Japan Works (Fukuyama Area), etc.
		Initiatives to improve competitiveness in iron ore procurement	Raw Materials Department I, etc.
		Initiatives to expand sales of high-strength construction plates	Construction Materials Engineering Department, etc.
		Improvement of manufacturing capability for hot-rolled pickled steel through quality improvement and significantly increase capacity by utilizing CPS	Hot Rolling Department, East Japan Works (Chiba Area), etc.
		Sales expansion and quality improvement of automotive GI steel sheets	Cold Rolling Department, West Japan Works (Kurashiki Area), etc.
		Improvement of customer satisfaction through the establishment of a QC/QA system for automotive steel sheets	Products Design & Quality Control for Sheet & Strip Department, West Japan Works (Fukuyama Area), etc.
JFE Engineering	Grand Prize, JFE Engineering President's Awards	Realization of a digital twin technology, a key technology for supporting daily life (an industry first) (optimization of operations and increase in profitability of methane fermentation plants)	Technology Headquarters/ J Bio Food Recycle Corporation

For more on external awards, please refer to the following information.

➤ **External Awards** (P.241)

Occupational Health and Safety

Basic Policy

Ensuring for the well-being 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 partner companies, works to consistently maintain safe working environments and secure workplaces for all employees.

Furthermore, the JFE Group seeks to create safe, attractive environments where everyone can enjoy working and aggressively promotes the establishment of environments in which personnel with diverse backgrounds can demonstrate their full potential. To that end, it has developed the JFE Group Health Declaration and collaborates with its health insurance union and industrial health staff to strengthen employee health so that everyone can work with vigor.

JFE Group's Occupational Health and Safety

To achieve our goal of zero workplace fatalities under the Seventh Medium-term Business Plan, the JFE Group will particularly prioritize 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, including monitoring and detection, by harnessing advanced IT solutions.

These efforts to ensure safety at the operating companies are regularly reported to the Board of Directors, which provides direction and supervision, and discussions on health and safety are held with the labor union through the Occupational Health and Safety Committee.

Data related to Lost-Work Injuries, see:
➤ **Data related to Lost-Work Injuries and Accidents** (P.225)

Occupational Health and Safety Targets and Results

As part of our commitment to safety first, the JFE Group promotes the development of a safety working environment. To achieve our top-priority goal of zero accidents, as set forth in the Seventh Medium-term Business Plan, we will bolster safety education and require stringent compliance with related rules while also focusing our efforts on eliminating accidents at our facilities.

Identifying the prevention of workplace accidents as a key management issue, we have also set KPIs to manage progress and promote relevant initiatives.

➤ **Material Issues of Corporate Management and KPIs** (P.19)

JFE Group Initiatives

Training Programs for Occupational Health and Safety

The JFE Group 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 (450 participants in 2021). We also conduct new employee training and position-specific training on mental health (1,241 participants in 2021).

Promotion System and Initiatives by Business Segment

JFE Steel

In 2021, we are following two basic strategies: practicing autonomous safety activities while developing communication between employees and business associates and taking action based on the Group's Health Declaration. In accordance with our goal of attaining the highest level of competence in the industry, 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.

To date, we have implemented safety activities based on the advice from Du Pont. We are going to develop these activities into an occupational health and safety management system in accordance with the ISO 45001 international standard as we seek to establish a corporate culture of safety that is voluntary and independent. We are working toward our goal of obtaining certification for all our construction and operating sites during FY2022.

<Certified Sites>
- Second half of FY2021: Chita Works, West Japan Works (Fukuyama Area)
- First half of FY2022: West Japan Works (Kurashiki Area), East Japan Works (Chiba Area)

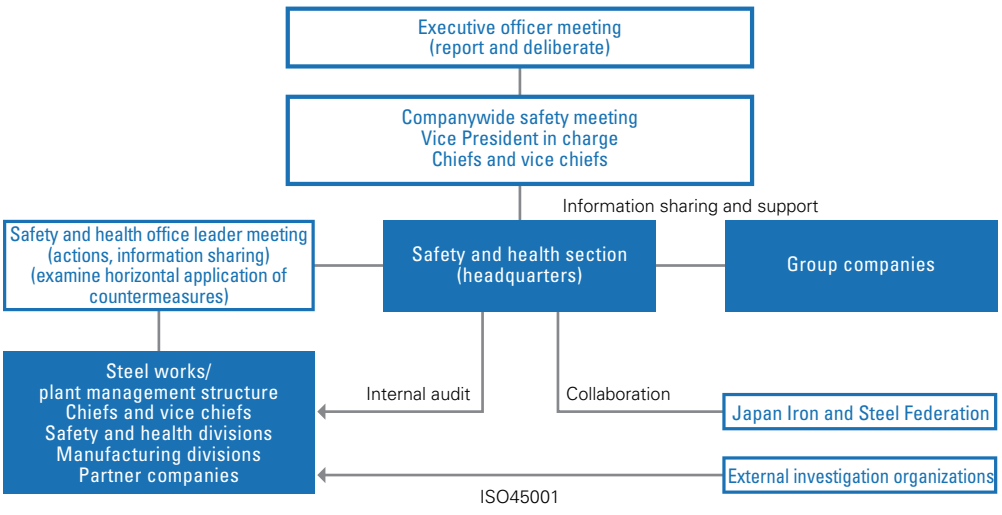
* A system that provides managers with information about, for example, carbon monoxideconcentration and oxygen concentration in real time along with the location information of workers.

To mitigate or prevent disaster risks, JFE Steel conducts risk assessments at the planning stage for new facilities as well as prior to their regular and non-regular repairs. We also constantly strive to make each facility safer 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 reports on 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 addition, we immediately report accidents to the Japan Iron and Steel Federation (JISF) under the guidelines for reporting industrial accidents. We file an update once we have determined the cause and decide on countermeasures. We also 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.

■ 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.

JFE Group's Health and Productivity Management

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.

Health and Productivity Management Targets and Results

Identifying the health of employees and their families as an important management concern, the JFE Group has set KPIs to manage progress and promote relevant initiatives. We are also working on health and productivity management by setting company-wide goals for each of our operating companies to promote the health of our employees and their families.

■ Company-wide Targets for Each Operating Company

	Items	FY2021 Results	FY2022 Targets
JFE Steel	Thorough implementation of physical examinations	77.4%	Rate of complete exams: 100%
		51.3%*	Rate of complete exams for dependents: 60%
	Preventive health measures	54.3%*	Rate of providing specific health guidance: at least 60%
		29.8%	Rate of obesity (BMI: 25 or higher): 25% or less
	Promotion of non-smoking	27.3%	Smoking rate: 28% (1.5% annual reduction)
JFE Engineering	Measures related to sleep	35.6%	Sleep-related risk (based on responses in health checkup questionnaire): 35% or lower
	Measures related to passive smoking	22.9%	Smoking rate: 21.9% or lower (1% annual reduction)
	Measures related to obesity	40.8%	Obesity rate (BMI: at least 25 or abdominal circumference ≧85/≧90 for male/female): 38.3% or lower
	Collaborated health promotion	30.6%*	Rate of providing specific health guidance: at least 50.0%
		54.1%*	Rate of complete exams for dependents: 60%
JFE Shoji	Preventive health measures	32.1%*	Rate of providing specific health guidance: at least 50%
	Family health promotion	56.8%*	Rate of complete exams for dependents: 60%
	Measures for non-smoking and passive smoking	21.5%	Smoking rate: 23.9% (1% annual reduction)

* Preliminary figures
* JFE Steel manages the rate of complete exams, obesity rate, and smoking rate on a calendar year basis.

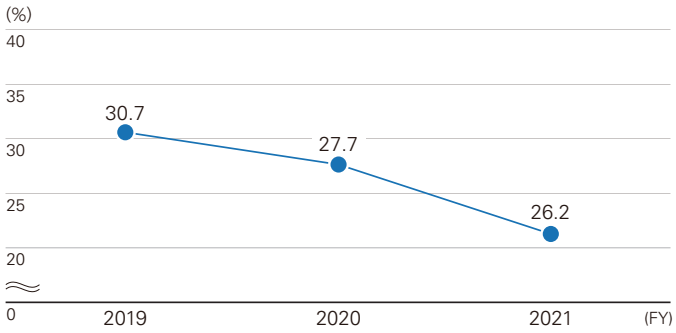
➤ Material Issues of Corporate Management and KPIs (P.19)

JFE Group Initiatives

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 50.2% in FY2021, up 12.6 points from 37.6% in FY2014.

For employee health data, please refer to the following information.

➤ Employee Health Data (P.227)

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 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 can maintain a healthy lifestyle, along with their accompanying family members, by conducting health checkups and vaccinations before they move overseas. 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.

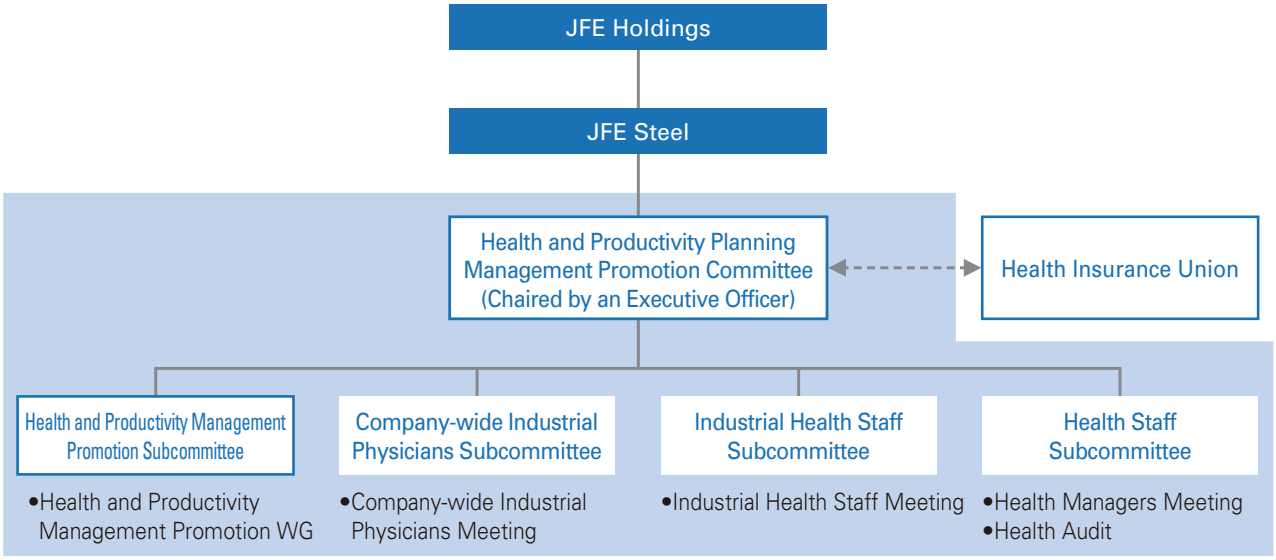
Promotion System and Initiatives by Business Segment

JFE Steel

Establishment of the Health and Productivity Planning Management Promotion System

To drive initiatives regarding 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 it is monitoring the achievement of medium- to long-term goals.

■ **Health and Productivity Planning Management Promotion System**



■ **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 activities • Reporting to the management team	
Frequency	February, May, August, November (once a quarter)	

Active Exercise

JFE Steel business sites offer the Active Exercise program, which the West Japan Works designed to help people increase their physical strength and prevent injuries due to 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 in a broad range of industries.

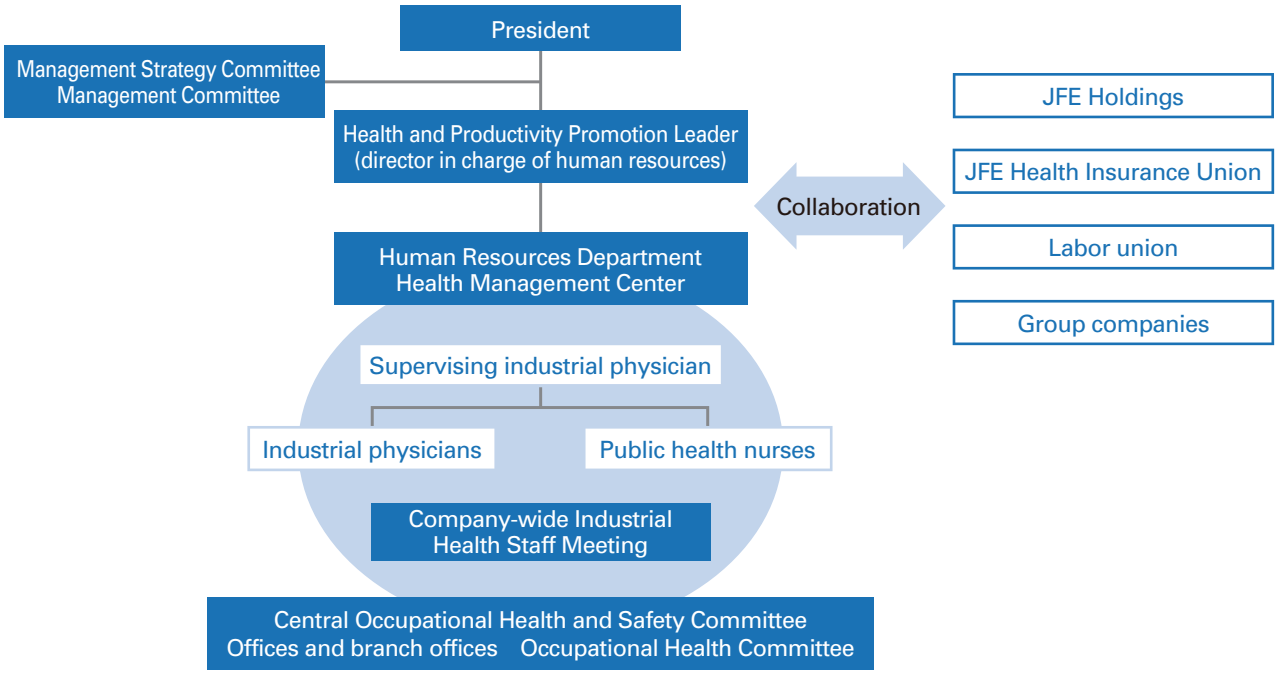
JFE Engineering

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

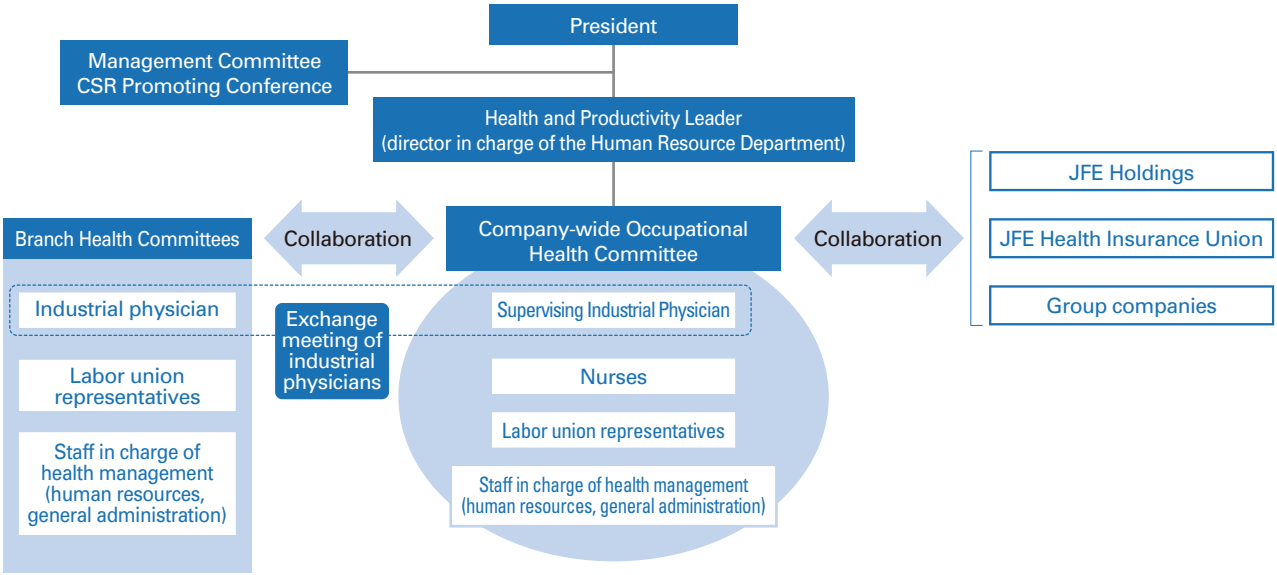
Fiscal Year Launched	Purpose	Initiatives
2018	Measures against cancer	Stomach endoscopy during regular health checkups
2019	Measures for improving sleep habits	Company-wide self-care seminars to practice napping and breathing exercises
2020	Measures against obesity	Labor and management co-sponsored RIZAP seminars and workplace exercises at home
2021	Measures against passive smoking	Complete ban on indoor smoking
	Measures for improving sleep habits	Company-wide self-care seminars to practice sleeping and breathing exercises
2022	Providing more individualized 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

Based on the belief that the health of employees and their families holds the key to the further development for the company, JFE Shoji is working to create 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 conducted on the importance of regular health check-ups and heart and brain disease
2019	Prevent lung cancer and stroke Measures related to passive smoke (reduction in smoking rate)	New program for subsidizing smoking cessation clinic fees
2020	Encouraging employees to exercise as a habit	Encouragement for participation in the Powering Up Health Care program

Response to the COVID-19 Pandemic

The JFE Group is addressing the COVID-19 pandemic through a variety of measures against infections from the perspectives of securing the health and safety of employees as well as avoiding business continuity risks. Each company practices thorough health management, including the wearing of masks, washing and disinfecting hands and monitoring body temperature. We also encourage teleworking as much as possible and promote off-peak commuting based on flexible workstyles without setting core work hours. We have installed partitions in offices and conference rooms to ensure physical distance, have been limiting the number of persons entering each room, and are also promoting online meetings in addition to other measures for avoiding crowded conditions.

Nonetheless, the steelworks and waste incineration facilities of JFE Steel, JFE Engineering, and JFE Shoji must continue their operations even under a state of emergency and are taking all possible measures to prevent infection.

We minimize the number of participants attending meetings required for safety and operational management by dividing them into groups while also taking care to avoid gaps in communication with regard to necessary information. During these meetings, we seek to avoid crowding while providing adequate ventilation, limiting attendance to the absolutely necessary number of personnel and maintaining sufficient physical distance between participants. We also adhere to industry guidelines and conduct thorough daily checks of employees' physical conditions.

In the lounge areas, we place vinyl sheet partitions at the center of the table to avoid that people do face each other while sitting. We also limit the number of employees coming to work by dividing them into three groups to stagger commuting.

Furthermore, JFE Steel has prepared and thoroughly communicated to all employees a response guideline for each workplace in the event of any suspected or confirmed case of COVID-19. To prevent the spread of infection in the workplace, the company was also quick to establish and implement a company-paid voluntary PCR testing system for those specified in accordance with the company's standards as individuals who, during working hours, were in close contact with other individuals who were infected.

To control infections and help reduce the local government's burden of conducting vaccinations, we have been actively cooperating with the workplace vaccination program. Approximately 47,000 employees were vaccinated at JFE Holdings' operating companies by the third round of inoculation at their workplaces.

On-site meeting

Group meeting

Labor Standards (Recruit and Nurture Diverse Human Resources)

Basic Policy

The JFE Group recognizes the importance of bringing out the full potential and vitality of its employees by investing in human capital, to both ensure legal and regulatory compliance and safeguard the sustainable growth of the Group.

To address social issues, as set forth in our Seventh Medium-term Business Plan, and to achieve our growth strategies by enhancing competitiveness, we are working to secure diverse human resources, 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.

Posters displayed at each workplace

Workstyle Reform

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.

Workstyle Reform Targets and Results

As defined in the JFE Group's Basic Policy on Human Resource Management, the JFE Group is committed to creating satisfying workplaces for employees and identifying the realization of satisfying workplaces as a key management issue. We have set KPIs to manage progress and promote relevant initiatives.

➤ Material Issues of Corporate Management and KPIs (P.19)

Promoting Satisfying Work 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 to meeting legal requirements on the upper limits for overtime and other mandates, the Group establishes challenging and satisfying work 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.

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 embarks on the challenge of achieving the biggest 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 create an environment that offers employees the flexibility to choose the workstyle most productive for them and that brings out the best of their abilities.

As society responded to the state of emergency declared under the COVID-19 pandemic, new lifestyles and workstyles became widespread. This was also true at JFE Steel, where employment styles that combine working at the office and at home have become applied, mainly at the head office and branches. Employee values on workstyles have also significantly changed. Seizing this as an opportunity to move beyond its response to COVID-19, JFE Steel is promoting its new workstyle to maximize employee productivity and output and to enhance engagement. 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; eliminate the use of seals by applying workflow automation software. Through these efforts, it will also promote a shift to a workstyle with higher added value and a transformation of its corporate culture.

In addition, JFE Steel introduced a cafeteria plan as an employee benefit program 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, 18 paid leave days on average (over 81% of the total) were taken by employees in FY2021. The company intends to raise this number to 20 in FY2022.

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 more efficiently use time. Teleworking, which was introduced as a preventive measure against COVID-19 infections, was adopted as a permanent system from 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 operational support provided by the back office 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.

During the COVID-19 pandemic, JFE Shoji has been flexibly applying its system, which includes expanding eligibility for working at home to all employees and temporarily adopting a flexible working hour program without core hours. 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 FY2021, RPA was deployed in over 450 types of operation, releasing over 60 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 120 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 has been steadfastly developing workstyle reform, spearheaded by the Office of Smart-Work Promotion set up in FY2018.

Prior to turning remote work into a permanent system starting in April 2021, the company introduced an electronic seal system for all employees to eliminate the need to come into the office to apply the seal. As a result, more than 10,000 documents were digitized each month, reducing paper use by 50%. In addition, RPA, used to automate 242 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 aims 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 2021 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 3,200 people across the group. These activities included reviewing meeting operations and document management, 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. The company will continue to foster a corporate culture that can flexibly adapt to the changing times and constantly evolve free of preconceived notions.

Invigorating Workplaces through Small Group Activities

JFE Steel

JFE Steel has approximately 1,500 small groups that 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 220 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

Diversity and Inclusion Targets and Results

As defined in the JFE Group's Basic Policy on Human Resource Management, the JFE Group is committed to diversifying human resources, recruiting and steadily nurturing excellent human resources, and identifying diversity and inclusion as a key management issue, we have set KPIs for the ratio of female employees, ratio of female managers, and ratio of male employees taking childcare leave to manage progress and promote relevant initiatives. In FY2022, we have set a new KPI for the ratio of female managers, which is to increase the percentage of women in managerial positions to at least 10% by 2030 (reaching at least 20% in administrative and sales divisions), and we are actively promoting the appointment of women to these positions.

➤ Material Issues of Corporate Management and KPIs (P.19)

Structure for Promoting Diversity

To ensure the consistent promotion of diversity, each operating company has a Diversity Promotion Section to organize educational activities, such as rank-based training and women's exchange meetings, and to share and implement best practices across the Group.

Workforce Diversity

By designating workforce diversity as a key business objective and to address the ever-evolving business environment, the JFE Group is promoting efforts under the Seventh Medium-term Business Plan to maximize the potential of employees regardless of gender, nationality, creed or lifestyle.

Given the growing need in recent years to ensure diversity among managerial personnel, it is becoming increasingly important to secure diverse and excellent human resources, including women, foreign nationals, and mid-career recruits.

Key Diversity Initiatives at Each Operating Company

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 actively conducting public relations. Since FY2021, the company has been deepening discussions on diversity issues mainly at the management level and setting targets for the entire company and each division to achieve. To promote the advancement of women, the company provides career support and management seminars for female employees and their supervisors toward increasing the number of female employees appointed to management positions. For female employees working in workplaces that operate in shifts, it 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 the 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. As part of efforts to encourage male employees to be engaged in parenting, the company held briefings for department heads to ensure that all of those whose spouses have given birth take childcare leave or childcare-related leave.

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, 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 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.

* In FY2021, only about 30 employees were accepted due to the impact of COVID-19, but this number is expected to gradually increase.

JFE Shoji

As part of its efforts to raise awareness within the company, JFE Shoji regularly holds diversity seminars for the management team, diversity management seminars targeting managers, including managers at Group companies, and e-learning for all employees. In FY2022, the Diversity Promotion Committee, comprising the management team, was established to share the diversity promotion policies and ensure the implementation of company-wide targets, thereby strengthening top-down initiatives. The company is also strengthening its efforts to support the career development of female employees by providing a new career training program for mid-career female employees together with their supervisors starting this fiscal year while also actively dispatching female employees to external training programs.

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. It also fosters global human resources and promotes exchange through measures such as management seminars in Japan for national staff at overseas bases for promoting them to leadership posts, creating an environment in which diverse human resources can pursue their careers with vigor.

Supporting Women in Professional Development

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.

In our latest move, we formulated the following action plan in accordance with the Act to establish a work 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)

Initiatives for Supporting Women in Professional Development

The JFE Group is implementing a broad range of initiatives to support female employees, such as increased hiring, enhanced childcare-support programs that significantly exceed statutory requirements, and training and education.

Furthermore, the initiatives and issues faced by each company are shared among operating companies. They are also discussed at such meetings as the Board of Directors in an ongoing effort to promote the initiatives.

In recognition of its efforts to encourage the empowerment of women, JFE Holdings was selected three times as a Nadeshiko Brand* since FY2013.

*The Nadeshiko Brand represents a joint initiative by the Ministry of Economy, Trade and Industry and the Tokyo Stock Exchange. It recognizes exemplary efforts by companies to encourage women to play active roles and continue working long-term. A single company is selected for each business sector represented in the TSE first section.

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.229)

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 2022, 673 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 created the Skilled Partner Program to rehire employees who want to continue working after mandatory retirement at age 60. The company will extend its mandatory retirement age to 65 in FY2023 to encourage veteran employees to make an even greater contribution.

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.

Respect for Sexual Minorities (LGBTQ)

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 textbook 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. 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 (FY2022) and Mid-career Recruits (FY2021)

526 people (three operating companies, excluding their subsidiaries)

- Women in positions with prospects for promotion: 19% (63 out of 333)
  Of the above, those in white-collar positions: 35% (45 out of 127)
- Mid-career and year-round recruits: 23% (119 out of 526)
  Of the above, recruits in positions with prospects for promotion: 32% (105 out of 333)
  Of the above, recruits in on-site positions at steelworks: 7% (14 out of 193)

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, Excluding their Subsidiaries) for University Graduates (FY2022) and Mid-career Recruits (FY2021)**

Category	Career-track Positions			On-site and Clerical Positions	Total
	White-collar	Technical	Total		
Male	82	188	270	165	435
Female	45	18	63	28	91
Total	127	206	333	193	526
Ratio of women (%)	35	9	19	15	17

For more on employees, refer to the following data.

➤ **Social Data** (P.228)

Human Resource Development

The JFE Group collectively carries out human resource development with an emphasis on nurturing the capacities of each employee and cultivating global human resources to support the expansion of our overseas business. We intend to continue making a Group-wide effort under the Seventh Medium-term Business Plan.

Human Resources Development Targets and Results

As defined in the JFE Group's Basic Policy on Human Resource Management, the JFE Group is committed to fostering a corporate culture that nurtures people and acknowledging the promotion of human resources development as a key management issue, and we have set KPIs to manage progress and promote relevant initiatives.

➤ **Material Issues of Corporate Management and KPIs** (P.19)

JFE Steel

Utilizing Skill Data for Training Programs

The generational replacement of employees has peaked, raising the importance of boosting the skills of younger employees. Accordingly, the company applies an evaluation system at manufacturing sites to quantitatively 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 pursuing initiatives to respond to DX technologies, which are rapidly being introduced and applied in industry, including improving internal training programs for data scientist personnel.

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 organizes 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 aimed at developing the basic skills required of trading company personnel, such as those for negotiation, finance and strategic thinking, trading business, and another course for newly hired mid-career employees. In addition, it also provides an overseas trainee program that enables employees to experience business operations at overseas Group companies and invites regional employees hired at overseas offices that require a high level of competency to Japan for training in order to increase their skills and motivation. JFE Shoji intends to raise the level of competence across the entire Group through these programs targeting a broad range of employees.

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.

We also seek to reflect the results of the corporate ethics survey, conducted every three years, 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 endorses and abides by the Universal Declaration of Human Rights, the International Covenant on Human Rights and other international conventions as well as the International Labour Organization's Declaration on Fundamental Principles and Rights at Work.

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. In FY2018, the JFE Group Human Rights Basic Policy was established to further clarify the approach to our initiatives. While we require Group companies and their officers and employees to adhere to the policy, we also seek cooperation from all stakeholders including our supply chain to respect and protect human rights.

In addition to organizing seminars by external experts on business and human rights, **starting in FY2021 we have been conducting human rights due diligence in accordance with the United Nations Guiding Principles on Business and Human Rights**. We will continue to promote initiatives Group-wide for realizing a society in which human rights are respected and protected.

Human Rights Basic Policy

1 Respect for basic human rights

We recognize the diverse values of individuals in all aspects of corporate activities and respect and defend all human rights in accordance with international norms.

2 Abolition of discrimination

We respect each person as an individual in corporate activities and shall not discriminate in any way with regard to race, nationality, ethnicity, creed, religion, social status, family origin, age, gender, sexual orientation, gender identity, or presence or absence of any disability.

3 Prohibition of harassment

We shall not engage in harassment with respect to gender, position or in any other way, or by any behavior that demeans degrades the dignity of others or causes mental discomfort.

4 Respect for fundamental labor rights

We value healthy labor-management relations and work to solve problems through constant dialogue between management and employees in good faith and in accordance with international norms, taking into account the laws and labor practices of each country. In addition, we always strive to upgrade worker safety and work environments that are rewarding for all employees.

5 Prohibition of child labor and forced labor

We shall not engage in any way in child labor or forced labor in any country or region.

6 Seek the cooperation to all stakeholders

Respecting and defending human rights is not only mandatory of all officers and employees of the JFE Group, we also seek the cooperation of our supply chain members and all other stakeholders to observe these principles and practices.

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.

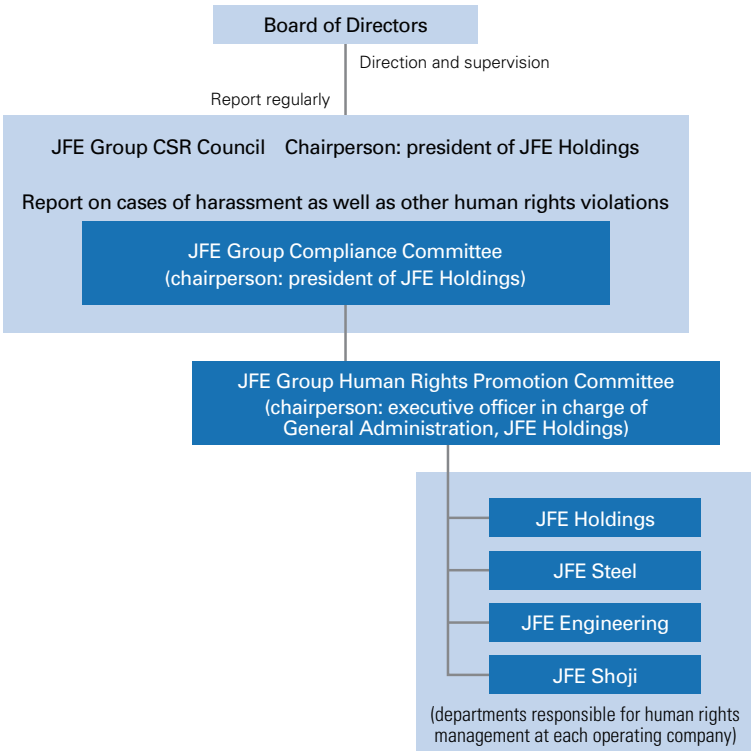
➤ Material Issues of Corporate Management and KPIs (P.19)

Promoting Human Rights

In order to steadily work 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 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 dedicated consultation desks on harassment issues at major offices, all of which accept anonymous reporting and consultation. 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 cases of harassment as well as other human rights violations are regularly reported to the JFE Group CSR Council and Board of Directors, which provide direction and supervision.

■ Governance Structure for Human Rights Awareness Promotion



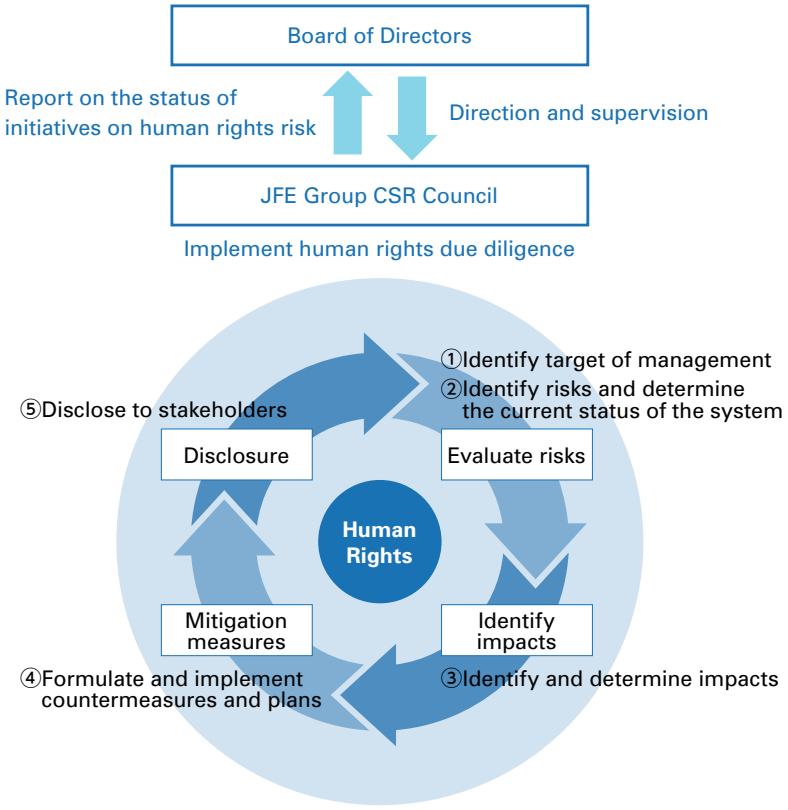
Human Rights Due Diligence

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 major Group companies, including JFE Steel, JFE Engineering, and JFE Shoji.

From FY2022 onward, we will continue striving to realize respect for human rights throughout the supply chain by promoting corrective measures to reduce identified risks while improving the management system for human rights risks at suppliers and gradually introducing the human rights due diligence process to Group companies.

■ Human Rights Due Diligence Process



FY2021 Initiatives

❶ Identify human rights risks

We created a long list of human rights referring to international norms and guidelines. 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.

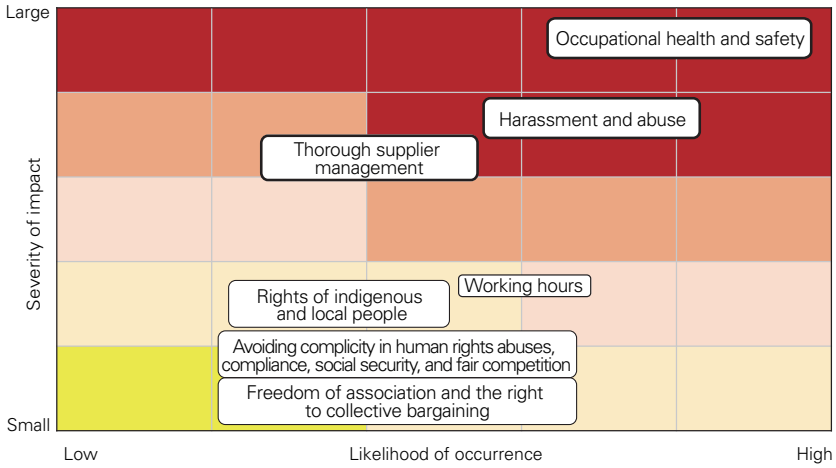
❸ Assess risks and determine impacts

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 examined mitigation measures for the identified human rights risks, including response and preventive and corrective measures, and promotion systems. For occupational health and safety and harassment, we will continue to strengthen our existing efforts to eliminate accidents and harassment using KPIs. As for the human rights risk management system for suppliers as a whole, we are considering establishing a human rights risk management system for suppliers starting in FY2022 for the creation of a sustainable and resilient supply chain.

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.

❶ Inspect and revise the JFE Group Human Rights Basic Policy

The JFE Group Human Rights Basic Policy was established in FY2018 to clearly express the Group's stance on respect for human rights. We will inspect and as necessary revise the policy based on the new human rights issues identified in FY2021 that the Group should take into consideration.

❷ Establish human rights risk management system for suppliers

Based on the revised JFE Group Human Rights Basic Policy, JFE Steel, JFE Engineering, and JFE Shoji will inspect and revise their respective basic policies and guidelines for procurement. In addition, we will request suppliers to comply with the revised basic policies and guidelines, and we will promote initiatives to build a human rights risk management system for them.

❸ Introduce a human rights due diligence process for major domestic and overseas Group companies

After determining the implementation targets, priorities, and methods of conducting investigations, we will introduce a human rights due diligence process in stages, conduct fact-finding surveys in writing, and take necessary corrective actions.

Continuing these initiatives will build a system to reduce human rights risks throughout the entire supply chain. We will also assess and improve our initiatives for respect for human rights under the supervision of the JFE Group CSR Council and Board of Directors to increase their effectiveness.

Human Rights Promoting Activities

To steadily promote our activities to respect human rights and raise employee awareness, we conduct human rights training courses, offer guaranteed employment opportunities, promote fair human-resource management, and work to prevent workplace harassment. Our training courses encourage employees to develop a thorough understanding of the JFE Group's 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 by designating the attendance rate as a KPI.

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 for each position (including managerial positions), individual offices, and executives. In addition, we invited an outside attorney to hold a seminar for corporate ethics hotlines and harassment consultation desk staff (those who receive reports, including management staff) within the JFE Group. We regularly organize these training sessions for hotline and consultation desk personnel (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 of such organizations and groups, we have become increasingly aware of human rights trends and challenges as well as issues specific to Japanese business. In turn we 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 work 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.

JFE Steel

Respecting Human Rights across the Supply Chain

JFE Steel recognizes that human rights violations and environmental issues pose actual business risks in procuring raw materials as well as materials and machinery. It therefore established the Raw Material Purchasing Policy and the Materials & Machinery Purchasing Policy to develop and maintain a sustainable procurement system with due respect for human rights, regulatory compliance, and environmental protection. JFE Steel also established the Business Conduct Guidelines and CSR Procurement Guidelines, asking suppliers to comply with these and seeking to publicize the guidelines across the supply chain via its website.

In terms of raw material procurement in particular, tantalum, tin, tungsten and gold produced in certain regions, such as the Democratic Republic of the Congo, are defined as conflict minerals under the U.S. Wall Street Reform and Consumer Protection Act. There is concern that such minerals provide a funding source for militias causing human rights violations and environmental destruction. Therefore, JFE Steel clearly prohibits the purchase of conflict minerals in its Business Conduct Guidelines. The company also 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.

For more information on the procurement of raw material and materials and machinery, refer to the following sources.

➤ **Business Conduct Guidelines of the Raw Materials Purchasing Policy**
(https://www.jfe-steel.co.jp/en/company/purchase_policy.html)

➤ **CSR Procurement Guidelines**
(https://www.jfe-steel.co.jp/en/company/purchase_policy.html#to-our-business-partners)

JFE Engineering

Respect for Human Rights in Procurement Activities

JFE Engineering is promoting CSR 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 work environment while observing laws, regulations, and social norms in their business activities, and it ensures that these policies are clearly communicated both internally and externally by publicizing them on the company's website.

For JFE Engineering's Purchasing and Procurement Policies, please refer to the following.

➤ **JFE Engineering Group Procurement Policy** (https://www.jfe-eng.co.jp/en/information/procurement_policy.html)

JFE Shoji

Respecting Human Rights across the Supply Chain

The JFE Shoji Group upholds respect for human rights, prohibition of discrimination, and prohibition of forced labor and child labor in its Basic Policy on Sustainability in the Supply Chain, and it requests the understanding and cooperation of suppliers in complying with this policy.

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.

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 FY2019***

	Location	Event	Date	Attendance
JFE Steel	East Japan Works, Keihin	Keihin Community Festival	May 26	46,000
	East Japan Works, Chiba	JFE Chiba Festival	October 27	30,000
	West Japan Works, Fukuyama	JFE West Japan Festival in Fukuyama	May 12	85,000
	West Japan Works, Kurashiki	JFE West Japan Festival in Kurashiki	November 3	80,000
	Chita Works	Handa Community Industrial Festival	November 9	20,000
JFE Engineering	Tsu Works	Autumn Festival 2019	October 19	4,000

* The list shows results for FY2019 as the events in FY2020 and FY2021 were canceled 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 FY2021, we received visitors (about 40,000) 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 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. These lectures have been given to over 270 classes since its start in FY2012. In FY2017, the company conducted the first class at a school for hearing impaired children. In FY2017, the company conducted the first class at a school for hearing impaired children.

Visiting lecturer at Samugawa Elementary School in Chiba City

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.

Contents to help build the friendship between Japan and China (awards ceremony in FY2021)

Presentation by a student (held online in FY2021)

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

FY2021 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 (FY2021)

JFE Steel	JFE Engineering	JFE Shoji
296 (desk work: 170, technical: 126)	666 (desk work: 117, technical: 549)	Approx. 285

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.

In FY2021, the contest was held online so as not to spread COVID-19.

JFE Shoji

Supporting Elementary Schools in Ghana and Nigeria

Since 2011, the JFE Shoji Group has continuously supported elementary schools in the West African countries of Ghana and Nigeria as part of its CSR activities. To address deficiencies in the local educational environment, it has also focused on donating goods related to education and food, which are essential for the sound development of children and greatly appreciated by the schools and governments in the countries. While the donation ceremony was canceled in FY2021 due to the COVID-19 pandemic, the Group donated 700 sets of desks and chairs, 17,000 notebooks, 12,500 cans of food, and 12,500 children's masks in an effort to prevent infection to elementary schools in Ogun State, Nigeria, and near Accra, Ghana.

The JFE Shoji Group is committed to continuing this project into the future 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 and cleaning and learning about distribution by introducing and selling sweets and coffee shop goods produced at their schools.

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.

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.230)

Support for Technology Research

The foundation has been highly acclaimed by many universities for its support of technology research since FY1991.

In FY2021, it fielded 144 grant requests and provided a total of 56 million yen in the form of grants valued at 2 million yen each for 11 projects involving iron and steel technologies and 17 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 FY2021, 50 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 FY2021, 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 2,400 copies of "Chikyu ni Manabu" (Learn from the Earth), a collection of the winning entries, again in FY2021, to 700 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)
- 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)
- 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)
- Donated emergency food supplies to a food bank
- Organized on-premise blood donation campaigns
- 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 (providing meals at a cafeteria using ingredients from the disaster area)
- Participated in cleanup and tree planting activities in the Kumozu River basin in Mie Prefecture
- Participated in tree planting to invigorate a rainforest in the Philippines*
- Donated emergency food to Kurashiki City Social Welfare Council
- Supported the holding and operation of the Okadama Aozora Market in Sapporo
- Organized environmental events at a contracted incineration plant
- Opened up the contracted incineration plant as an evacuation site in the event of a disaster and provided emergency supplies

*Postponed or canceled in FY2020 and FY2021 in response to the COVID-19 pandemic.

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
- Supported technician education in Southeast Asia
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc03-01)
- 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)
- Provided work experience
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc03-04)
- 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)
- Cooperated with NPO School Support Center
  (https://www.jfe-steel.co.jp/en/company/csr.html#anc03-08)
- 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)
- Obtained outstanding 3R-activities certification from Yokohama City (9th straight year)
- Donated PET bottle caps
- Cooperated with nonprofit Green Bird in volunteer garbage collection
- Volunteered to fertilized cherry trees

Sports and Cultural Promotion

- Held local sporting events (https://www.jfe-steel.co.jp/en/company/csr.html#anc02-01)
- Baseball and racing clubs held instructional classes (https://www.jfe-steel.co.jp/en/company/csr.html#anc02-02)
- 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 food recycling, renewable energy power generation, and waste-to-energy power generation.

- Development and Provision of Eco-friendly Processes and Products (P.100)

JFE 21st Century Foundation

The JFE 21st Century Foundation was established in 1990 with the support of JFE, including the former Kawasaki Steel. As a public-interest foundation it undertakes various civic-minded services, including providing financial aid for university research and promoting local culture.

JFE 21st Century Foundation (http://www.jfe-21st-cf.or.jp/eng/)

- Issued technical research grants (steel-related technology, global environment, technology for preventing global warming)
- Issued grants for Asian historical research
- Created 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

Shareholders and Investors

Shareholder and Investor Relations Policies

JFE Group Standards of Business Conduct

2 Be open to society

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

Returns to Shareholders

The JFE Group positions returns on shareholder investment as one of its top priorities. Profits are basically returned in the form of dividends. The Group's basic policy under the Seventh Medium-term Business Plan is to achieve a payout ratio of about 30%.

Proactive Information Disclosure

The JFE Group strives for fair disclosure based on established internal policy. The Group actively communicates with investors by holding meetings when announcing financial results, medium-term business plans or other important information. The executive directors explain the announced results and answers questions at investor meetings, and they also hold small-group briefing sessions and conducts individual interviews with institutional investors and securities analysts. In addition, they regularly visit investors in Japan and overseas, including institutional investors in North America and Europe.

For individual investors, briefings are held at the branch offices of securities firms around Japan.

The Group also distributes e-mails regarding IR information. Important press releases and Notices of the Ordinary General Meeting of Shareholders are provided in English for overseas investors.

In addition, JFE Holdings is committed to fair disclosure of information under its disclosure policy.

■ Major IR Activities (FY2021)

Activity	Participants
Investor meetings, ESG briefings	Approx. 1,000 persons in total
Individual interviews with institutional investors and securities analysts	Approx. 380 persons in total
Briefings for private investors (web-based)	Approx. 10,000 playbacks in 2 briefings

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

➤ **Disclosure policy** (https://www.jfe-holdings.co.jp/en/investor/management/disclosure-policy/index.html)

➤ **Investor information: Japanese version** (https://www.jfe-holdings.co.jp/investor)

➤ **Investor information: English version** (https://www.jfe-holdings.co.jp/en/investor)

Enhancing Communication with Shareholders

JFE Holdings created its Investor Relations and Corporate Communications Department in April 2015 to facilitate more interactive communication with diverse stakeholders. The collection and dissemination of integrated information is being enhanced to provide management with more useful information for constructive dialogues with shareholders, including individual investors as well as domestic and foreign institutional investors.

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.

We offer plant tours of our steel works, recycling plants, shipyards, and other facilities as a special benefit for shareholders, with many of them applying for and participating in them every year. (These tours were cancelled in FY2020 and FY2021 to prevent the spread of COVID-19.)

In FY2021, we held online plant tours for the first time (two tours attended by approximately 1,400 people in total).

For data related to plant tours and company briefing sessions for shareholders, please refer to the following information.

➤ **Plant tours for shareholders (Japanese only)** (https://www.jfe-holdings.co.jp/investor/stock/factory_tour/index.html)
➤ **Major IR Activities** (P.230)

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 implementing various initiatives aimed at enhancing corporate governance, such as formulating the Basic Policy on Corporate Governance, establishing the Nomination Committee and Remuneration Committee, introducing a performance-linked remuneration system for directors, and evaluating directors' effectiveness.

In FY2022, we also introduced indicators for employee safety in an effort to use non-financial metrics related to the environment, society, and other aspects as indicators for performance-linked remuneration for directors. We plan to introduce indicators related to climate change during the Seventh Medium-term Business Plan and will continue to consider other indicators.

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 CSR 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.19)

Key Initiatives

- **Introduction of non-financial metrics for employee safety as indicators of performance-based remuneration for directors** (P. 193)
- **Analysis and evaluation of board of directors' effectiveness** by a third-party organization (P. 191)
- Disclosure of **skills matrix** for directors and Audit & Supervisory Board members (P. 190)
- **Corporate Ethics Awareness Survey** implemented periodically (once every three years) for officers and employees of JFE Holdings and operating companies (P. 201)
- Continuous **oversight and confirmation of effectiveness of Group-wide risk management by the Board of Directors** (P. 202)

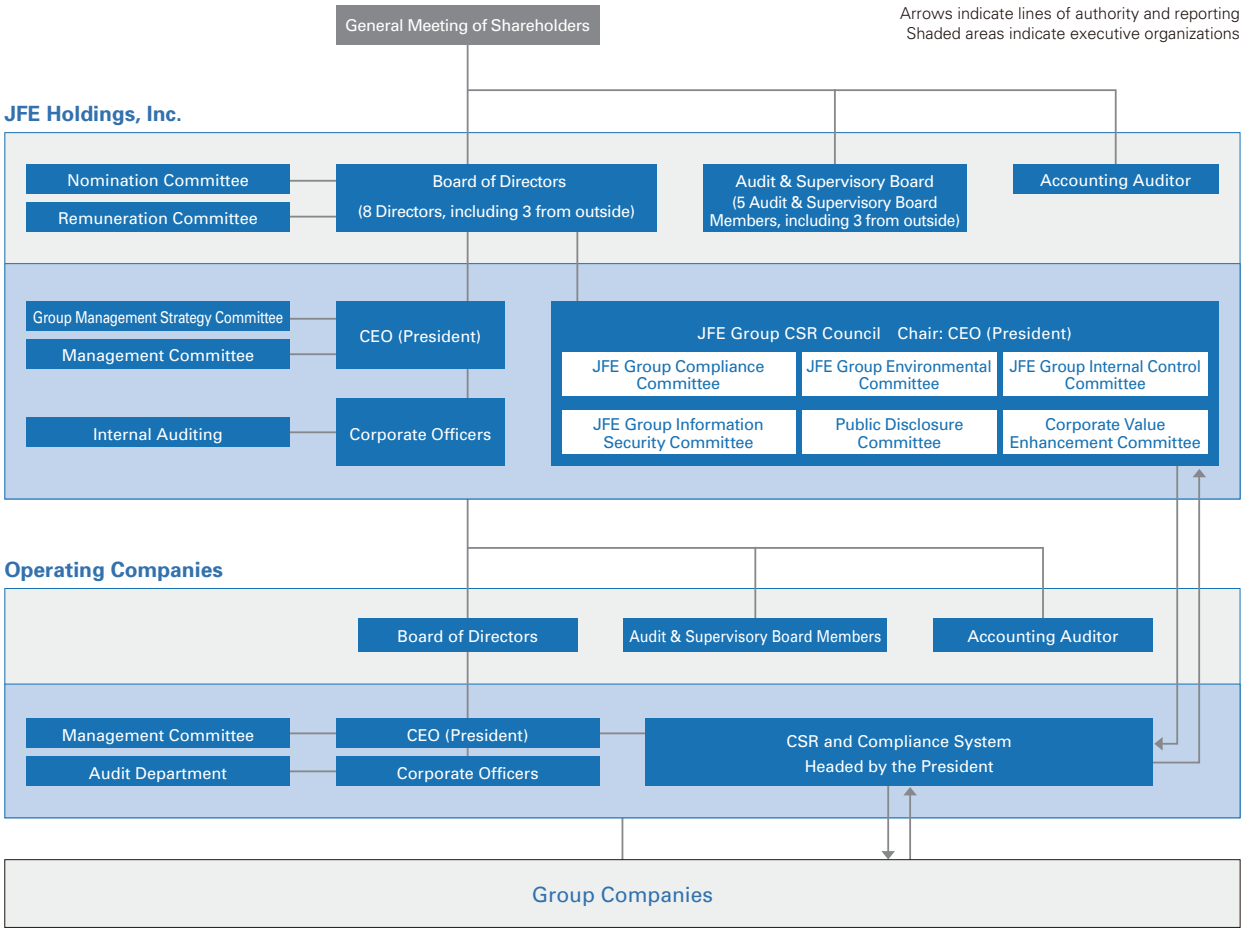
Corporate Governance

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)



Part of the governance data can be accessed from the following link.

➤ Governance Data (P.231)

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.

➤ Corporate Governance System (P.231)

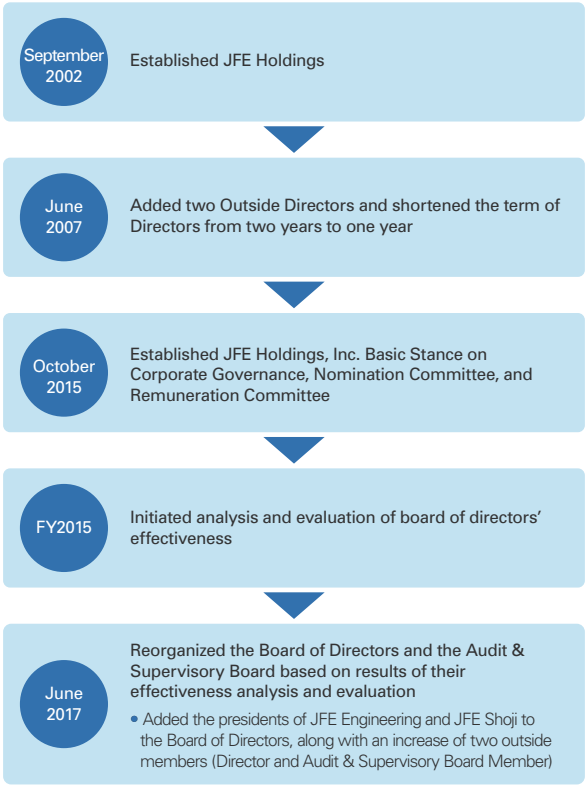
Major Topics Discussed at the FY2021 Board of Directors Meeting

- Seventh Medium-term Business Plan
- Large-scale capital expenditures (e.g., upgrade systems at steelworks (Kurashiki), construction of the factory for the offshore wind-power monopile foundation structures
- Policy on the JFE Group's initiatives for offshore wind-power business
- ESG initiatives (e.g., efforts to achieve carbon neutrality, assessment and review of KPIs for material issues of corporate management)

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



Independent Outside Directors

Independent Outside Directors comprise one-third or more of the total number of Directors. Independent Outside Directors will be elected from persons who are appropriate to bear the responsibility of strengthening governance such as those who possess abundant experience as management in global enterprises or experts who possess profound knowledge and satisfy our independence standards. Currently, of the eight Directors, three are Independent Outside Directors.

Independent Outside Audit & Supervisory Board Members

More than half of the Audit & Supervisory Board Members are from outside. Independent Outside Audit & Supervisory Board Members will be elected from persons who are appropriate to bear the role of enhancing the auditing function such as those who possess abundant experience as management in global enterprises or experts who possess profound 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.232)

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

In October 2015, JFE Holdings set up the Nomination Committee and the Remuneration Committee 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 policy on the election and dismissal of the President of the Company, proposals for the election of candidates for the President of the company, succession plans of the President of the Company, and the nomination of candidates for Outside Directors and Outside Audit & Supervisory Board Members. Five meetings were held in FY2021, with 100% attendance rates for all of them. The Remuneration Committee deliberates 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. Seven meetings were held in FY2021, with 100% attendance rates for all of them.

➤ Nomination Committee and Remuneration Committee (P.233)

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 Board's Effectiveness

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 an objective viewpoint. In FY2021, questionnaires were sent to all Directors and Audit & Supervisory Board Members after adding and revising their content based on the revision of the Corporate Governance Code.

Furthermore, we examined the results of our efforts in FY2021 to reflect the opinions and recommendations of the FY2020 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 FY2021 initiatives reflecting the results of the effectiveness of evaluations up to FY2020 include the following.

- Enriched discussions on specific initiatives regarding sustainability issues, including reports to the Board of Directors on topics such as Group-wide initiatives for achieving carbon neutral, as well as diversity and inclusion, and a review of material issues and KPIs of corporate management.
- Outside Officers meetings as preliminary reports have been held to stimulate discussion in the Board of Directors meetings, and we decided to regularly hold exclusive meetings for Outside Officers to provide more opportunities for exchanging opinions.
- Established a Group governance system, in which the Board of Directors receives reports from the Group CSR Council on achievements of and plans for its activities to discuss, and supervises Group-wide risk management. Specific initiatives in FY2021 include reports to the Board of Directors of information security, anti-corruption, and survey results on compliance efforts in Group companies. Going forward, we will continue to improve Group-wide risk management in accordance with discussions at Board of Directors meetings.

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.

- Further strengthen the Board of Director's supervisory function by improving reporting content in regard to responses to risk management of the Group and sustainability issues
- Appropriately supervise the measures and their implementation as the Board of Directors to sharpen focus on and awareness of compliance

In FY2022, the Board of Directors will continue to consider holding Board meetings at domestic operating companies and conducting inspection visits of domestic and overseas operating companies, taking into consideration COVID-19, to increase opportunities for exchanging opinions with top executives of the operating companies.

Following up on these points, we will continue to 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.233)

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 company's 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 (zero workplace fatalities and lost-work injuries rate) as the performance-linked indicators and multiplying the level of achievement of these indicators by a certain coefficient for each position.

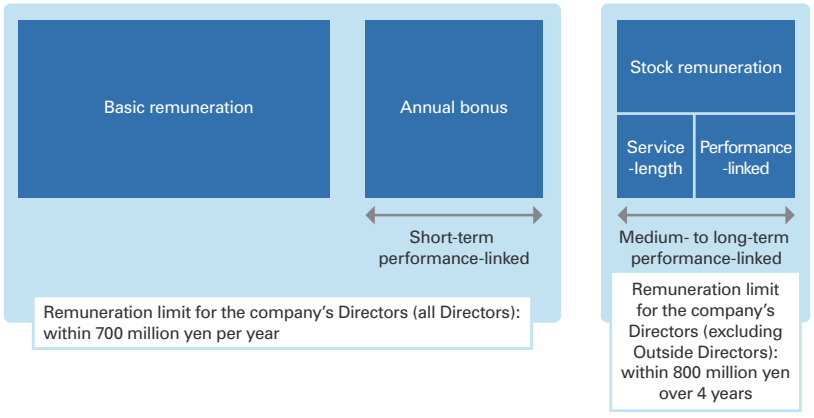
• Stock remuneration

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.

Starting in FY2022, non-financial indicators will be used in addition to the existing financial indicators for performance-linked remuneration. We plan to design remuneration for Directors and Corporate Officers using non-financial indicators that will eventually combine multiple indicators related to the environment, society, etc., and in FY2022, we first introduce an indicator related to employee safety in annual bonuses. Furthermore, indicators related to climate change, which is positioned as a top priority management issue, will be introduced in the remuneration plan for Directors and Corporate Officers during the Seventh Medium-term Business Plan period. We will continue to study the introduction of other indicators into the remuneration plan for Directors and Corporate Officers.

■ **Composition of Remuneration for the Company's Directors**



➤ Executive Remuneration (P.234)

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 CSR Council, Regulations for Organization and Operations, Regulations for Document Management, Regulations for Addressing Violence Directed at Companies, and the installation of Corporate Ethics Hotline. In April 2021, we revised the Basic Policy and established the group governance system, in which the JEF Group Council chaired by the JFE Holdings' CEO (President), centrally carries out Group-wide risk management and reports critical matters to the Board of Directors for direction and supervision to increase effectiveness of the Board of Directors and strengthen its auditing function over risk management. The Basic Policy will be revised and improved 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 operating companies and key Group companies has internal audit organizations comprising 169 people as of April 1, 2022. These organizations share information to enhance overall auditing within the Group.

Audits by Audit & Supervisory Board Members

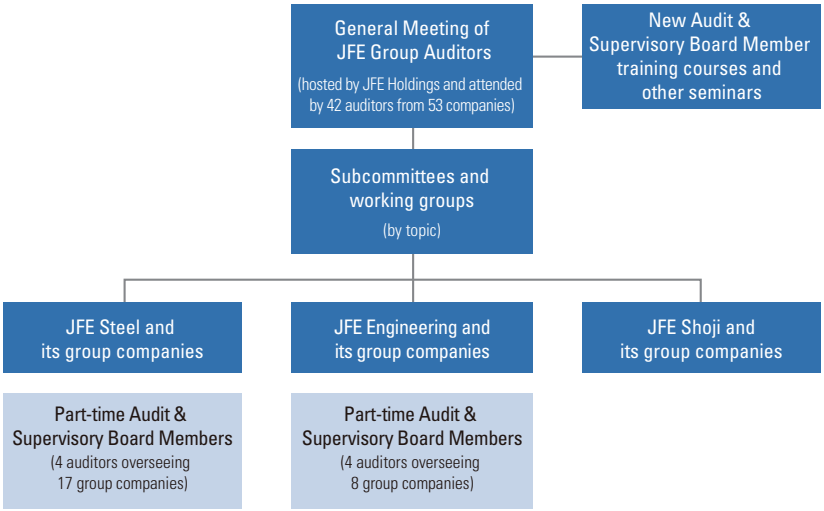
Audit & Supervisory Board Members attend meetings of the Board of Directors, Group Management Strategy Committee, and Management Committee as well as the Group CSR Council and other important meetings. To audit how Directors execute their responsibilities, they conduct hearings with Directors and corporate 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 the Members through information sharing and ensure 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.233)

■ Structure of JFE Group Board of Auditors



Cooperation between Audit & Supervisory Board Members and Accounting Auditor

In FY2021, the Audit & Supervisory Board Members held eight 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 FY2021, the Audit & Supervisory Board Members held six 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 Sytems 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 maintaing 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 2022.

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 meetings regularly confirm the significance of the strategic shareholdings and whether the benefits and risks of such holdings are commensurate with their capital cost, and sell strategic shareholdings if there is no significance of such shareholdings or there is a risk of damage to shareholders' interest. In FY2019, the Company, as described above, decided on a policy not to hold domestic listed stocks as strategic shareholdings in principle, and sold all or part of 143 stocks for 145.9 billion yen (on a market value basis) from FY2019 to FY2020. In FY2021, the Company sold all or part of 61 stocks for 41.9 billion yen (on a market value basis). Furthermore, the Board of Directors, at a meeting held in August 2021, examined the significance of its strategic holdings and the return on investment from the above perspective.

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
Number of issues	219	171	146
Total balance sheet amount (billion yen)	166.1	96	71.2

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.

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.

➤ **Material Issues of Corporate Management and KPIs** (P.19)

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)

Ensure Adherence to Corporate Ethical Standards and Compliance

Compliance Education

As part of its initiative to raise awareness of compliance, the JFE Group compiled a Compliance Guidebook that was distributed to employees and executives (domestic and overseas) to be used in activities such as collation and to ensure that the rules are fully communicated and informed. The guidebook provides a simple explanation of concrete standards for complying with laws and internal rules and for acting in line 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, anticorruption 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.

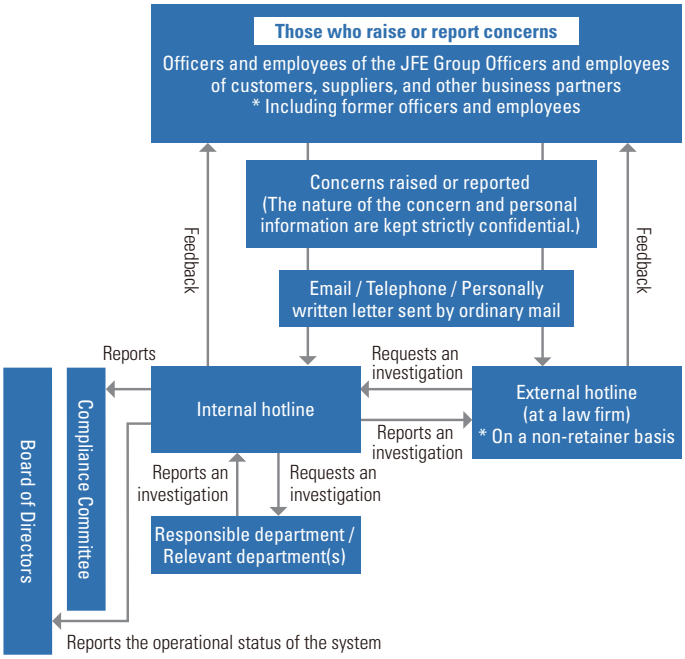
We strive to prevent incidents of misconduct and ensure the early detection and correction of wrongdoing by accepting consultations and reports, ranging from compliance issues such as violation of the Antimonopoly Act, corruption, and bribery, to human rights abuses including misconduct and harassment 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 outside stakeholders via a form 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 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 once every three years for directors and employees of the Company as well as the 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 FY2019 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. Issues identified are reflected in the specific initiatives of each company for improvement under the supervision of the JFE Group CSR Council and the Board of Directors. The next Awareness Survey will be conducted in FY2022 to confirm the status of improvement and changes in employee awareness, and the results will be reflected in future initiatives.

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.

We deeply regret this situation and sincerely apologize for the inconvenience and concern caused to many of the related parties. We are determined to ensure compliance and pursuing Group-wide initiatives to restore trust as soon as possible.

Risk Management

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.**

In April 2021, we established a system whereby all risks in the Group are centrally managed by the Council and all critical matters are reported to the Board of Directors for direction and supervision.

Specifically, corporate oficers are responsible for recognizing risks, and those deemed material are then confirmed and assessed by **the JFE Group CSR 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 mangement.

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 CSR System (P.23)
➤ Development of the Whistleblowing System (P.199)

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 CO_2 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.84)

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.

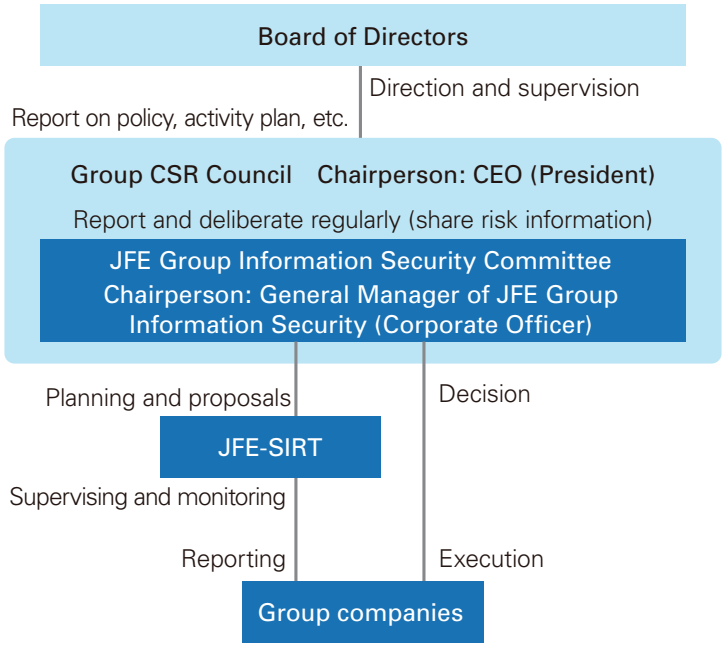
Key issues related to IT, particularly information security, are deliberated by the JFE Group Information Security Committee to determine Group policy.

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. 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**



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, starting in FY2021, the Group has been conducting human rights due diligence. We are moving toward establishing the management cycle to enhance our ability to respond to human risks across the supply chain from FY2022 to support the creation of sustainable supply chains.

For more details on our human rights due diligence initiatives, refer to Human Rights.

➤ Human Rights (P.168)

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 CSR 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 drainage at our steelworks to address the impact of typhoons and torrential rains that are occurring in Japan with increasing severity.

Response to the COVID-19 Pandemic

We have addressed the COVID-19 pandemic by quickly setting up a response team and implementing measures based on the policies for an assumed outbreak of a new strain of influenza. We have sought to reduce commuting by relaxing internal requirements to recommend various styles of working at home. For employees who must work at the office, we have adopted staggered commuting, installed office partitions and are using teleconferencing and other means to reduce the risk of infection insofar as possible. We have also established an environment in which employees can carry out their work even at home without any problems through such measures as promoting paperless workflows and introducing electronic approval and seal systems. Through these initiatives, we seek to explore more flexible workstyles and improve the productivity of our workforce. Through these initiatives, we seek to explore more flexible workstyles and improve the productivity of our workforce.

In particular, JFE Steel has reviewed its BCP for the novel influenza epidemic and conducted a simulation to gauge the effects on operations in case an increase in the number of infections leads to a rise in the absence rate. The company is preparing responses to diverse situations to maintain key businesses including operations at our steelworks while improving its workplace environment by practicing thorough hygiene management and implementing a remote working infrastructure. We have also been actively promoting workplace COVID-19 vaccinations. We will continue to place top priority on the safety and wellness of employees and others involved in the company.

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.

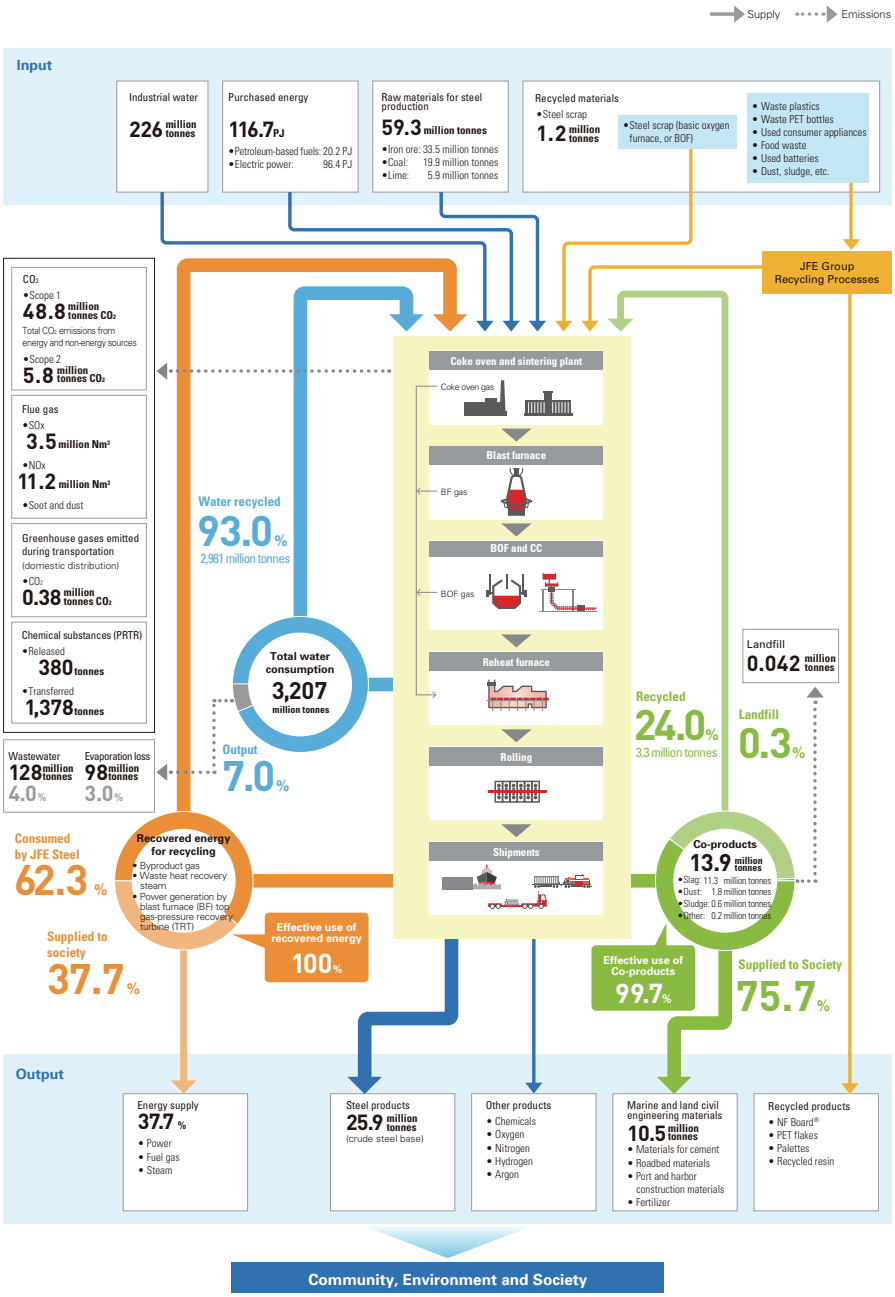
Moreover, we seek to forge relationships of trust with the tax authorities in each country by raising transparency and without resorting to tax planning or the use of tax havens to evade taxation.

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 93.0% of the water it uses for production and uses 99.7% 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	**38,600** tonnes
Energy	
•Electric power purchased	**25.0** GWh
•Class A heavy oil	**53.7** kl
•Kerosene	**4.8** kl
•Light oil	**220** kl
•Gasoline	**13.6** kl
•City gas	**294,000** Nm³
•LPG	**85.2** tonnes
Water	**62,900** tonnes

JFE Engineering

- **Tsurumi Works**
- **Tsu Works**

Output and Emissions

Products	**37,400** tonnes
CO_2	**8,100** tonnes CO_2
•Scope 1	**1,700** tonnes CO_2
•Scope 2	**6,400** tonnes CO_2
Waste generated	**999** tonnes
•Industrial wastes	**803** tonnes
•General wastes	**196** tonnes
Wastewater (ocean only)	**132,000** tonnes
Others (PRTR)	**146** 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	FY2017	FY2018	FY2019	FY2020	FY2021
% covered by ISO 14001 certification	Base	All	%	54	54	58	58	54
		ST Gr	%	20	20	21	21	18
		EN Gr	%	5	5	9	9	8
		SH Gr	%	29	29	28	28	27
	Employee	All	%	70	72	74	70	68
		ST Gr	%	—	72	75	74	72
		EN Gr	%	—	60	60	51	50
		SH Gr	%	—	88	92	89	83
Environmental audit (number of sites)		ST Gr	sites	31	31	32	24	29
		EN Gr	sites	48	50	48	28	52
Environmental education conducted (total participants)		EN Gr	people	996	1,059	1,063	731	1,131

■ Environmental Accounting Data (1)

Breakdown of environmental protection cost		FY2020		FY2021	
		Investment (billion yen)	Cost (billion yen)	Investment (billion yen)	Cost (billion yen)
Management	Impact monitoring and measurement, and EMS expenses and education	1.4	2.6	1.4	2.5
Global warming countermeasures	Saving and efficiently using energy	14.4	25.2	18.9	27.0
	Recycling industrial water	2.4	16.9	6.6	17.4
Conservation of natural resources	Recycling and waste management of internally generated materials, etc.	0.6	4.8	1.2	5.9
Environmental protection	Air pollution countermeasures	5.3	32.9	12.4	31.4
	Water pollution countermeasures	4.7	10.6	7.2	9.6
	Prevention of soil contamination, noise, vibration, and subsidence	0	0.6	0	0.5
Other	Charges, etc.	—	1.6	—	1.4
R&D	Technologies for protecting the environment, saving energy, and preventing global warming	0.8	8.3	0.8	9.3
Societal activities	Support for nature preservation and forestation, information disclosure, exhibitions, and public relations	—	0.6	—	0.6
Total		29.7	104.0	48.5	105.6

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	FY2017	FY2018	FY2019	FY2020	FY2021
Energy-saving investment (accumulated)	All	billion yen	492.9	505.4	532.1	546.5	565.4
Environmental protection investment (accumulated)	All	billion yen	692.4	708.5	727.6	742.1	770.9

Climate Change

■ CO_2 Emissions by Scope

Items	Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Scopes 1 and 2 total*1*2	All	million t-CO_2	62.2	59.9	60.4	53.1	59.0
	ST Gr	million t-CO_2	62.1	59.7	60.0	52.6	58.6
	ST	million t-CO_2	58.5	55.4	56.0	49.1	54.7
	ST subsidiaries	million t-CO_2	3.6	4.3	3.9	3.5	3.9
	EN Gr	thousand t-CO_2	56.5	212	403	484	387
	EN	thousand t-CO_2	17.3	17.5	16.8	14.1	10.3
	EN subsidiaries	thousand t-CO_2	39.3	195	386	470	377
	SH Gr	thousand t-CO_2	35.7	36.2	35.3	29.6	31.9
	SH	thousand t-CO_2	0.5	0.5	0.5	0.4	0.4
	SH subsidiaries	thousand t-CO_2	35.2	35.8	34.8	29.2	31.5
Scope1*3*4	All	million t-CO_2	54.9	52.3	52.9	46.6	51.9
	ST Gr	million t-CO_2	—	52.1	52.5	46.2	51.5
	ST	million t-CO_2	52.5	49.2	49.8	43.8	48.8
	ST subsidiaries	million t-CO_2	—	3.0	2.7	2.4	2.7
	EN Gr	thousand t-CO_2	—	171	361	442	345
	EN	thousand t-CO_2	—	7.8	3.8	2.4	2.4
	EN subsidiaries	thousand t-CO_2	—	163	357	439	343

Items	Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Scope2*5	All	million t-CO_2	7.4	7.6	7.6	6.4	7.1
	ST Gr	million t-CO_2	—	7.5	7.5	6.4	7.0
	ST	million t-CO_2	6.0	6.2	6.3	5.3	5.8
	ST subsidiaries	million t-CO_2	—	1.3	1.2	1.1	1.2
	EN Gr	thousand t-CO_2	—	41.6	42.2	42.4	41.8
	EN	thousand t-CO_2	—	9.7	12.9	11.6	7.9
	EN subsidiaries	thousand t-CO_2	—	31.9	29.3	30.8	33.9
	SH Gr	thousand t-CO_2	35.7	36.2	35.3	29.6	31.9
	SH	thousand t-CO_2	0.5	0.5	0.5	0.4	0.4
	SH subsidiaries	thousand t-CO_2	35.2	35.8	34.8	29.2	31.5
Unit CO_2 emissions (numerator: Scopes 1 and 2 total; denominator: sales)*6	All	t-CO_2/ billion yen	16,898	15,463	16,193	16,442	13,515
Scope3*7*8	All	thousand t-CO_2e	16,272	16,751	16,382	14,369	20,778
Category 1 Purchased goods and services	All	thousand t-CO_2e	13,048	13,371	12,557	11,026	17,244
Category 2 Capital goods	All	thousand t-CO_2e	921	1,180	1,401	1,226	1,221
Category 3 Fuel and energy related activities not included in Scopes 1 or 2	All	thousand t-CO_2e	386	370	728	671	717
Category 4 Upstream transportation and delivery	All	thousand t-CO_2e	650	491	489	419	454
Category 5 Waste generated in operations	All	thousand t-CO_2e	87	100	57	45	58
Category 6 Business travel	All	thousand t-CO_2e	4	4	4	4	5
Category 7 Employee commuting	All	thousand t-CO_2e	54	49	49	51	59
Category 15 Investments	All	thousand t-CO_2e	1,122	1,186	1,097	927	1,022

*1 Data cover 79 companies
- JFE Steel and 29 major domestic and overseas subsidiaries
- JFE Engineering and 12 major domestic and overseas subsidiaries
- JFE Shoji and 35 major domestic and overseas subsidiaries.

*2 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 Starting with FY2018, data for 2 JFE Steel major domestic subsidiaries and a JFE Engineering major domestic subsidiary include CO_2 emissions from non-energy sources.
*5 CO_2 Emission Factor for Purchased Electricity in FY2021:
- 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 FY2020.
- 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 The JFE Group changed its accounting standards from JGAAP to IFRS in FY2018.
*7 Coverage:
(Categories 1, 2, 3, 4, 5) JFE Steel, 23 JFE Steel major domestic subsidiaries, JFE Engineering, and JFE Shoji
(Category 6, 7) JFE Steel, 23 JFE Steel major domestic subsidiaries, JFE Engineering, 12 JFE Engineering major domestic and overseas subsidiaries, and JFE Shoji
(Category 15) Japan Marine United, and 9 JFE Steel equity-method affiliates (7 domestic and 2 overseas)
*8 Sources: Green Value Chain Platform (Ministry of the Environment) and others

■ Other Greenhouse Gas

Items			Scope	Unit	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
CO_2 emissions from energy sources	CO_2 emissions (Scopes 1 and 2 total)		ST Gr	million t-CO_2	60.8	57.0	57.4	50.2	55.8
			ST	million t-CO_2	56.6	53.5	54.2	47.3	52.6
			ST subsidiaries	million t-CO_2	4.3	3.5	3.2	2.9	3.2
			EN Gr*1*2	thousand t-CO_2	56.5	66.7	67.5	62.5	61.4
		Scope1	ST	million t-CO_2	50.5	47.3	47.9	41.9	46.8
	Unit: CO_2 emissions (denominator: crude steel production)		ST	t-CO_2/ t-steel	1.99	2.03	2.03	2.08	2.03
CO_2 emissions from non-energy sources			ST Gr*3	million t-CO_2	—	2.61	2.65	2.40	2.74
			ST	million t-CO_2	1.91	1.87	1.89	1.82	2.05
			ST subsidiaries	million t-CO_2	—	0.74	0.76	0.58	0.69
			EN subsidiaries*4	million t-CO_2	—	0.15	0.34	0.42	0.33

Items		Scope	Unit	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
GHG emissions other than CO_2		All	thousand t-CO_2e	94.8	88.7	103.3	96.1	103.0
	Methane (CH_4)	All (ST only)	thousand t-CO_2e	76.2	72.2	72.9	68.3	74.6
	N_2O	All	thousand t-CO_2e	18.6	16.5	30.4	27.9	28.5
		ST	thousand t-CO_2e	18.6	16.5	20.0	15.5	17.7
		EN subsidiaries*4	thousand t-CO_2e	—	—	10.4	12.4	10.8
GHG emitted during transportation*5		ST Gr	million t-CO_2	0.65	0.66	0.65	0.57	0.63
		ST	million t-CO_2	0.37	0.40	0.40	0.34	0.38
		ST subsidiaries	million t-CO_2	0.28	0.26	0.25	0.23	0.25
Contribution to CO_2 emission reductions*6		EN Gr	million t-CO_2/year	4.06	4.12	4.13	9.65	10.57
	Biomass power generation	EN Gr	million t-CO_2/year	1.97	2.12	2.12	2.74	2.86
	Waste power generation	EN Gr	million t-CO_2/year	1.64	1.53	1.53	3.37	3.40
	Others (digestion gas, geothermal, solar power, wind, waste heat recovery, fuel conversion, etc.)	EN Gr	million t-CO_2/year	0.46	0.47	0.48	3.54	3.57
	Recycling	EN Gr	million t-CO_2/ year	—	—	—	—	0.74

*1 Data cover JFE Engineering and 12 major domestic and overseas subsidiaries.
*2 Expanded coverage of major subsidiaries for JFE Engineering for FY2021.
*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 10 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
- From FY2020, JFE Engineering's domestic and overseas businesses and its German subsidiary Standardkessel Baumgarte GmbH (SBG) are covered
- FY2021 data cover JFE Engineering's domestic and overseas businesses, J&T Recycling Corporation, JFE Urban Recycle Corporation, and German subsidiary Standardkessel Baumgarte GmbH (SBG)

■ Energy

Items		Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Energy consumption and unit energy consumption	Energy consumption	All	PJ	—	—	670	592	654
		ST Gr	PJ	—	—	669	591	652
		ST	PJ	644	613	620	545	602
		ST subsidiaries	PJ	—	—	48.8	45.2	49.6
		EN Gr	PJ	—	—	1.3	1.2	1.3
		SH Gr	PJ	—	—	0.6	0.6	0.7
	Unit energy consumption (crude steel production)	ST	GJ/ t-steel	22.6	23.3	23.2	24.0	23.3
	Energy consumption (Crude petroleum equivalent)	EN	kl	10,960	10,886	8,788	8,000	7,636
	YOY ratio of unit energy consumption	EN	%	97.4	95.4	80.7	91.0	95.5
Recovered energy for recycling	Supplied to society	ST	%	37	39	39	38	38
	Consumed internally	ST	%	63	61	61	62	62

■ Modal Shift Rate

Items		Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
All transportation	Ship and rail	ST	%	66.1	60.2	59.6	58.4	58.3
	Truck	ST	%	33.9	39.8	40.4	41.6	41.7
Transportation of a distance of 500 km or more	Ship and rail	ST	%	92.7	91.6	90.9	91.6	90.0
	Truck	ST	%	7.3	8.4	9.1	8.4	10.0

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 (FY2021)

Company name	CO_2 emissions (unit: thousand t-CO_2)	Energy consumption (unit: PJ)
JFE Mineral & Alloy Company, Ltd.	758.0	10.79
JFE Bars & Shapes Corporation	482.3	9.77
JFE Chemical Corp.	221.4	4.50
JFE LOGISTICS CORPORATION	172.2	2.42
JFE Galvanizing & Coating Co., Ltd.	62.1	1.36
JFE Pipe Fitting Mfg. Co., Ltd.	14.6	0.36
JFE Plastic Resource Corporation	20.3	0.39
MIZUSHIMA RIVERMENT CORP.	10.3	0.16
JFE Container Co., Ltd.	10.8	0.22
J-Logitec Co., Ltd.	8.2	0.12
Galvatex Corporation	4.6	0.09
JFE Metal Products & Engineering Inc.	8.6	0.19
JFE Welded Pipe Manufacturing Co., Ltd.	5.9	0.16
JFE Techno-wire Corporation	5.3	0.12
JFE PRECISION CORPORATION	3.8	0.08
K-PLASHEET CORPORATION	5.1	0.08
JFE LIFE CORPORATION	6.2	0.12
CHIBA RIVERMENT AND CEMENT CORP.	8.1	0.16
JFE KENZAI FENCE CO., LTD.	2.1	0.06
JFE Steel Pipe Co., Ltd.	3.0	0.07
GECOSS CORPORATION	2.7	0.06
JFE Kozai Corporation	3.5	0.07
JFE Ferrite Corporation	4.0	0.07
6 overseas companies	1,401.6	18.17
Total	3,224.5	49.57

* Due to the merger of Mizushima Ferroalloy Co., Ltd. and JFE Material Co., Ltd. into JFE MINERAL COMPANY, LTD. (JFE Mineral & Alloy Company, Ltd.) in April 2022, the FY2021 CO_2 emissions of the two companies are combined with Mineral & Alloy Company, Ltd.

■ CO_2 Emissions from Energy Sources and Energy Consumption of JFE Engineering Group Subsidiaries (FY2021)

Company name	CO_2 emissions (unit: thousand t-CO_2)	Energy consumption (unit: PJ)
J&T Recycling Corporation	42.2	0.785
J Farm Corporation	2.8	0.015
Fujikako, Inc.	1.5	0.010
NORTHERN JAPAN MACHINERY Corporation	1.0	0.005
TOHOKU DOCK TEKKO CO., LTD.	0.8	0.005
JFE Environmental Service Corporation	0.6	0.003
Asuka Soken Co., Ltd.	0.7	0.014
JFE Pipeline Engineering Corporation	0.5	0.002
JFE Technos Corporation	0.2	0.001
JFE Aqua Machine and Service Corporation	0.0	0.000
JFE Project One Co., Ltd.	0.1	0.000
J&M Steel Solutions Company Limited	0.8	0.005
Total	50.3	0.839

Prevention of Pollution

■ Air Emissions

Items	Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
SOx emissions*	ST Gr	million Nm^3	4.7	4.1	4.3	3.3	3.5
	ST	million Nm^3	4.6	4.1	4.3	3.3	3.5
	ST subsidiaries	million Nm^3	0.05	0.04	0.04	0.03	0.03
NOx emissions*	ST Gr	million Nm^3	11.7	10.7	11.3	10.4	11.4
	ST	million Nm^3	11.5	10.5	11.1	10.3	11.2
	ST subsidiaries	million Nm^3	0.20	0.19	0.17	0.14	0.18

* 11 JFE Steel consolidated subsidiaries in Japan.

■ Release to Waterways

Items	Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
COD (chemical oxygen demand)	All*1	t/day	3.1	3.5	3.4	3.1	3.1
	ST	t/day	3.0	3.3	3.2	2.9	2.9
	ST subsidiaries	t/day	0.14	0.17	0.15	0.17	0.23
	EN*2	kg/day	5.6	6.8	8.4	8.7	8.4

*1 Coverage:
- JFE Steel and 11 consolidated subsidiaries in Japan.
- JFE Engineering

*2 This report uses the maximum value of each year.

■ Chemical Substances Management

Items		Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
PRTR-registered substances*1*2	Amount released	All*3	t	—	1,019	918	754	827
		ST Gr	t	897	814	766	596	672
		ST	t	516	545	481	341	380
		ST subsidiaries	t	381	269	285	255	292
		EN Gr	t	—	205	152	158	155
		EN	t	85	147	107	121	116
		EN subsidiaries	t	—	58.4	45.4	36.7	39.3
	Amount transferred	All*3	t	—	9,210	7,866	5,949	9,845
		ST Gr	t	8,934	9,176	7,832	5,910	9,811
		ST	t	2,726	2,533	1,865	1,694	1,378
		ST subsidiaries	t	6,208	6,643	5,967	4,216	8,433
		EN Gr	t	—	34	34	39	34
		EN	t	28	28	29	26	30
		EN subsidiaries	t	—	5.7	5.4	12.5	4.4

*1 Coverage:
- JFE Steel and 16 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 (FY2021)

Company name	SOx emissions(unit: Nm^3)	NOx emissions(unit: Nm^3)
JFE Mineral & Alloy Company, Ltd.	17,466	98,781
CHIBA RIVERMENT AND CEMENT CORP.	197	1,396
MIZUSHIMA RIVERMENT CORP.	0	1,459
JFE PRECISION CORPORATION	1,975	709
JFE Plastic Resource Corporation	164	313
JFE Bars & Shapes Corporation	2,417	11,695
JFE Metal Products & Engineering Inc.	53	546
JFE KENZAI FENCE CO., LTD.	0	0
JFE Galvanizing & Coating Co., Ltd.	1,662	12,645
JFE Container Co., Ltd.	85	0
JFE Welded Pipe Manufacturing Co., Ltd.	0	0
JFE Steel Pipe Co., Ltd.	0	0
Galvatex Corporation	0	1,008
JFE Pipe Fitting Mfg. Co., Ltd.	21	440
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.	8,433	46,131
K-PLASHEET CORPORATION	169	0
JFE LIFE CORPORATION	0	0
Total	32,641	175,121

Efficient Use of Natural Resources

■ Natural Resources

Items		Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Input	Raw materials for steel production	ST	million t	71.3	66.0	67.0	58.7	59.3
	Iron ore	ST	million t	43.5	40.1	41.4	35.4	33.5
	Coal	ST	million t	22.0	20.6	20.3	18.1	19.9
	Lime	ST	million t	5.8	5.3	5.3	5.2	5.9
	Recycled materials (steel scrap)	ST	million t	1.2	1.3	1.1	0.8	1.2
	Raw materials	EN	thousand t	41.8	47.3	39.4	36.9	38.6
Products supplied	Steel products	ST	million t	28.5	26.3	26.7	22.8	25.9
	Engineering products	EN	thousand t	39.7	44.5	36.6	34.7	37.4

■ Co-products and Wastes

Items		Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Co-products	Amount generated*1	ST Gr	million t	16.2	16.1	15.6	13.9	14.4
		ST	million t	15.7	15.3	15.1	13.4	13.9
		ST subsidiaries	million t	0.5	0.8	0.5	0.5	0.5
	Amount recycled internally	ST	million t	4.2	6.0	5.0	3.3	3.3
	Internal recycle rate	ST	%	27.5	39.3	32.9	24.9	24.0
	Landfill amount*1	ST Gr	million t	0.081	0.081	0.074	0.060	0.094
		ST	million t	0.047	0.052	0.043	0.037	0.042
		ST subsidiaries	million t	0.034	0.029	0.031	0.023	0.052
	Recycling rate	ST	%	99.7	99.7	99.7	99.7	99.7
Marine, land, and civil engineering material (using co-products)	Co-products generated	ST	million t	15.4	15.3	15.1	13.4	13.9
	Used by local communities	ST	million t	11.2	9.2	10.1	10.0	10.5
	Rate of local communities use	ST	%	72.2	60.4	66.8	74.8	75.7

Items			Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Wastes	Amount generated*2*3		EN Gr	thousand t	158.0	131.7	211.0	159.1	249.2
		Offices	EN	t	429.8	386.4	367.1	329.2	235.3
			Yokohama HO	t	357.1	299.9	299.0	256.9	156.7
			Tsu works	t	72.7	86.5	68.2	72.3	78.6
		Productions	EN	t	773.0	1,039.3	1,340.5	1,072.3	803.0
			Tsurumi works	t	302.3	506.6	653.8	519.8	364.7
			Tsu works	t	470.7	532.7	686.7	552.5	438.3
		Constructions	EN	t	88,140.4	109,045.2	145,397.7	97,387.9	190,242.3
		Subsidiaries	EN subsidiaries	t	69,835.7	22,634.4	63,876.7	60,296.7	57,960.3
	Landfill		EN	t	1,666.5	2,125.1	4,489.3	2,011.6	3,035.6
		Offices	EN	t	9.0	10.7	8.5	9.1	7.4
			Yokohama HO	t	4.3	4.1	3.3	2.1	2.2
			Tsuworks	t	4.7	6.6	5.2	7.0	5.2
		Productions	EN	t	289.0	353.3	312.6	351.2	322.6
			Tsurumi works	t	70.6	83.2	77.3	75.2	89.4
			Tsuworks	t	218.4	270.1	235.3	276.0	233.2
		Constructions	EN	t	1,368.5	1,761.1	4,168.2	1,651.3	2,705.6
	Recycling rate		EN	%	96.7	97.0	95.8	95.9	96.5
	Recycling rate (offices)		EN	%	97.6	96.7	97.3	96.8	96.1
			Yokohama HO	%	98.7	98.5	98.8	99.1	98.5
			Tsuworks	%	89.0	85.2	85.2	87.2	88.4
	Recycling rate (production)		EN	%	45.3	46.8	68.0	48.8	46.8
			Tsurumi works	%	61.0	68.7	79.4	72.0	68.3
			Tsuworks	%	37.0	32.1	60.9	33.8	28.0
	Recycling rate (construction)		EN	%	98.4	98.4	97.1	98.3	98.6

*1 Data cover JFE Steel and 23 consolidated subsidiaries in Japan.
*2 Data cover JFE Engineering and 10 consolidated subsidiaries in Japan.
*3 Data from FY2019 includes wastes generated at offices and productions of JFE Engneering.

■ Wastes at JFE Engineering Construction Sites

Items		Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Rubble	Amount generated	EN	t	58,824	78,410	113,637	78,100	159,309
	Landfill amount	EN	t	94	297	1,533	484	940
	Recycle rate	EN	%	99.8	99.6	98.6	99.4	99.4
Sludge	Amount generated	EN	t	23,463	16,142	17,225	12,399	24,350
	Landfill amount	EN	t	849	199	205	135	683
	Recycle rate	EN	%	96.3	98.8	98.8	98.9	96.9
Industrial waste excluding rubble and sludge	Amount generated	EN	t	5,853	14,494	13,788	6,678	6,583
	Landfill amount	EN	t	425	1,265	1,923	868	1,083
	Recycle rate	EN	%	92.2	91.0	85.0	85.4	81.6

■ Paper Consumption at JFE Shoji

Items	Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Consumption of copier papers	SH*	boxes	5,100	4,832	4,675	3,021	3,261
	Tokyo	boxes	2,674	2,661	2,516	1,333	1,471
	Osaka*	boxes	527	372	399	310	337
	Nagoya	boxes	308	217	293	157	220
	Branch	boxes	1,591	1,582	1,467	1,221	1,233

* Revised the prior year data to increase accuracy.

Water Security

■ Water

Items	Scope	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Amount of water accepted*1	All	million t	241	240	242	237	246
	ST Gr	million t	241	238	241	236	245
	ST	million t	220	218	221	215	226
	ST subsidiaries	million t	20.6	20.5	19.8	20.9	19.0
	EN Gr	thousand t	832	918	1,410	1,296	1,141
	EN	thousand t	97	102	106	72	63
	EN subsidiaries	thousand t	735	816	1,304	1,223	1,078
	SH Gr	thousand t	166	165	149	160	154
	SH	thousand t	—	—	—	—	—
	SH subsidiaries	thousand t	166	165	149	160	154
Amount of water released*2	ST Gr	million t	146	144	143	141	144
	ST	million t	128	126	126	123	128
	ST subsidiaries	million t	17.8	18.0	17.0	18.3	15.6
	EN	thousand t	140	146	126	157	132
Amount of water consumption*2	ST Gr	million t	3,690	3,665	3,616	3,331	3,442
	ST	million t	3,410	3,376	3,323	3,066	3,207
	ST subsidiaries	million t	280	289	293	265	235
Amount evaporated	ST	million t	92	92	95	92	98
Ratio of amount released and evaporated	ST	%	6.5	6.5	6.6	7.0	7.0
Amount recycled*2	ST Gr	million t	3,449	3,427	3,375	3,096	3,423
	ST	million t	3,190	3,158	3,102	2,851	3,207
	ST subsidiaries	million t	259	269	273	245	216
Recycling rate*2*3	ST	%	93.5	93.5	93.4	93.0	93.0
	ST subsidiaries	%	93	93	93	92	92

*1 Coverage:
- JFE Steel and 23 consolidated subsidiaries in Japan.
- JFE Engineering and 7 consolidated subsidiaries in Japan.
- 31 JFE Shoji domestic and overseas consolidated subsidiaries.

*2 Data cover JFE Steel and 23 JFE Steel consolidated subsidiaries in Japan.

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

■ Water Related Data by Water Intake Source and Discharge Source

Items	Scope	Unit	FY2017*1	FY2018*1	FY2019*1	FY2020	FY2021
Total amount accepted	All*2	million t	219.7	218.4	221.0	214.8	226.1
River/lake		million t	0	0	0	0	0
Groundwater		million t	0	0	0	0	0
Industrial water/ waterworks		million t	219.7	218.4	221.0	214.8	226.1
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*2	million t	128.9	126.1	126.8	123.6	128.8
Ocean		million t	128.5	125.7	126.3	123.1	128.3
Surface water		million t	0	0	0	0	0
Underground/well		million t	0	0	0	0	0
Off-site water processing		million t	0.4355	0.4431	0.4502	0.4796	0.4709
Beneficial use/other use		million t	0	0	0	0	0
Other discharge source		million t	0	0	0	0	0

*1 Data for past fiscal years were retroactively revised for increased accuracy.
*2 Data cover JFE Steel and JFE Engineering.

Water Security (Supplementary Data)

■ Amount of Water Accepted and Released at JFE Steel Group Subsidiaries (FY2021)

Company name	Amount accepted (unit: tonnes)	Amount released (unit: tonnes)
JFE Mineral & Alloy Company, Ltd.	6,502,592	6,045,806
CHIBA RIVERMENT AND CEMENT CORP.	10,499	10,499
MIZUSHIMA RIVERMENT CORP.	15,260	15,260
JFE PRECISION CORPORATION	225,642	225,642
JFE Plastic Resource Corporation	16,926	13,094
JFE Bars & Shapes Corporation	4,904,692	2,769,528
JFE Metal Products & Engineering Inc.	80,655	100,845
JFE KENZAI FENCE CO., LTD.	70,022	70,022
JFE Galvanizing & Coating Co., Ltd.	670,524	537,716
JFE Container Co., Ltd.	250,560	250,560
JFE Welded Pipe Manufacturing Co., Ltd.	24,668	24,668
JFE Steel Pipe Co., Ltd.	1,682	1,682
Galvatex Corporation	738,191	738,191

Company name	Amount accepted (unit: tonnes)	Amount released (unit: tonnes)
JFE Pipe Fitting Mfg. Co., Ltd.	41,474	28,742
JFE Techno-wire Corporation	93,193	93,193
JFE Kozai Corporation	14,138	14,138
GECOSS CORPORATION	71,434	71,631
JFE LOGISTICS CORPORATION	105,623	105,623
J-Logitec Co., Ltd.	2,960	2,960
JFE Chemical Corp.	4,303,904	3,960,483
K-PLASHEET CORPORATION	30,325	26,930
JFE LIFE CORPORATION	518,912	509,039
Total	18,693,876	15,616,252

■ Amount of Water Accepted at JFE Engineering Group Subsidiaries (FY2021)

Company name	Amount accepted (unit: thousand tonnes)
J&T Recycling Corporation	1,024
JFE Environmental Service Corporation	30.5
NORTHERN JAPAN MACHINERY Corporation	0.002
TOHOKU DOCK TEKKO CO., LTD.	0.04
JFE Aqua Machine and Service Corporation	0.001
Fujikako, Inc.	0.05
J Farm Corporation	23.5
Total	1,078

Social Data

Responsibility to Customers

■ Customer Training (FY2019*1)

Name of training	Scope	Unit	Participants
Technical presentation by overseas Group companies (number of participating companies*2)	JFE Shoji	People (companies)	33 (15)
Training for overseas employees	JFE Shoji	People	24

*1 The table shows FY2019 results since FY2020 and FY2021 customer training sessions were canceled due to the COVID-19 pandemic.
*2 Data covers 9 countries for the number of participating companies.

Occupational Health and Safety

■ Lost-work Injuries and Accidents

Items		Scope*1	Unit	2017	2018	2019	2020	2021
Lost-work Injuries and Severity (Rates)	Lost-work injuries*2	JFE Steel	—	0.17	0.17	0.28	0.23	0.10
	Severity*3		—	0.15	0.15	0.30	0.08	0.08
	Lost-work injuries*2	JFE Engineering	—	0.71	0.82	0.45	0.35	0.56
	Severity*3		—	0.02	0.02	0.62	0.01	0.40
	Lost-work injuries*2	JFE Shoji Group	—	1.22	0.60	1.00	0.76	0.60
	Severity*3		—	0.97	0.04	0.02	0.04	0.05
	Lost-work injuries*2	Manufacturing industry average	—	1.02	1.20	1.20	1.21	1.31
	Severity*3		—	0.08	0.10	0.10	0.07	0.06
Number of lost-work injuries	Lost-work injuries	JFE Group	Cases	42	41	49	36	26
	Fatal injuries		Cases	3	2	6	1	2
	Lost-work injuries	JFE Steel	Cases	18	18	30	23	10
	Fatal injuries		Cases	2	2	4	1	1
	Lost-work injuries	JFE Engineering	Cases	14	18	11	7	11
	Fatal injuries		Cases	0	0	2	0	1
	Lost-work injuries	JFE Shoji Group	Cases	10	5	8	6	5
	Fatal injuries		Cases	1	0	0	0	0

Items		Scope*1	Unit	2017	2018	2019	2020	2021
Lost-work Injuries Involving Employees	Lost-work injuries	JFE Group	Cases	13	13	18	15	10
	Fatal injuries		Cases	2	1	1	0	0
	Lost-work injuries	JFE Steel	Cases	4	7	10	9	5
	Fatal injuries		Cases	1	1	1	0	0
	Lost-work injuries	JFE Engineering	Cases	0	1	2	2	1
	Fatal injuries		Cases	0	0	0	0	0
	Lost-work injuries	JFE Shoji Group	Cases	9	5	6	4	4
	Fatal injuries		Cases	1	0	0	0	0
Lost-work injuries involving employees of contractors	Lost-work injuries	JFE Group	Cases	29	28	31	21	16
	Fatal injuries		Cases	1	1	5	1	2
	Lost-work injuries	JFE Steel	Cases	14	11	20	14	5
	Fatal injuries		Cases	1	1	3	1	1
	Lost-work injuries	JFE Engineering	Cases	14	17	9	5	10
	Fatal injuries		Cases	0	0	2	0	1
	Lost-work injuries	JFE Shoji Group	Cases	1	0	2	2	1
	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 (2021)

Items	Unit	Participants*
Training for managers and supervisors	People	450
Mental healthcare education for new hires and at rank-based training	People	1,241

* Total of 3 operating companies.

■ Employee Health Data

Items	Scope	Unit	2017	2018	2019	2020	2021
Metabolic syndrome rates	Insured by the JFE Group's health insurance union (age 40 and above)	%	35.9	36.0	35.6	36.5	36.2
Rate of health examination for dependents	Age 40 and above	%	43.7	48.2	51.5	46.3	50.2

* Rate of health examination for dependents for FY2021 is a preliminary figure.

■ Health Data for Employees and Their Family

Items	Scope	Unit	2017	2018	2019	2020	2021
Provision rate of health guidance	JFE Steel	%	36.8	56.9	64.2	53.0	54.3
	JFE Engineering	%	22.7	22.1	39.6	39.1	30.6
	JFE Shoji	%	25.0	45.2	36.0	41.6	32.1
Smoking rates	JFE Steel	%	35.2	32.4	31.8	29.0	27.3
	JFE Engineering	%	27.5	26.7	26.4	23.3	22.9
	JFE Shoji	%	25.8	24.8	24.9	24.9	21.5

* Provision rate of health guidance for FY2021 is a preliminary figure.
* Smoking rate for JFE Steel is managed based on calendar year.
* Smoking rates for JFE Shoji for FY2017 and FY2018 represent results for those age 40 and above.

Labor Practice

■ Employee Data (2021)

Category	Consolitaded/ non-consolitaded	Unit	JFE Steel	JFE Engineering	JFE Shoji
Employees	Conslidated*1	people	44,999	11,205	8,040
Male		people	39,241	9,698	5,731
Female		people	5,758	1,507	2,309
Management positions*3		people	11,569	3,673	1,595
Male		people	10,802	3,465	1,387
Female		people	767	208	208
Ratio of women in management positions		%	6.6	5.7	13.0
Employees	Non-consloitaded*2	people	15,600	3,875	1,016
Male		people	14,294	3,327	611
Female		people	1,306	548	405
Management positions (manager or higher)		people	1,722	1,590	629
Male		people	1,697	1,550	591
Female		people	25	40	38
Ratio of women in management positions		%	1.5	2.5	6.0
Recruits		people	276	169	81
Male		people	248	138	49
Female		people	28	31	32
New graduates		people	256	89	62
Mid-career		people	20	80	19
Years of continuous employment (average)		year	15.1	14.9	14.2
Male		year	14.8	14.9	14.7
Female		year	17.8	15.2	13.2
Job turnover rate*4 (total3.3%)		%	3.5	1.8	5.2
Elderly employees*5		people	598	43	30
Ratio of elderly employees*5		%	3.8	1.1	3.0
Average annual leave taken		day/year	15.9	17.9	12.1
Average overtime		hours/ month	22.2	26.1	32.8
Employees working shorter hours for childcare (aggregated)		people	101	60	63
Temporary staffs		people	164	686	17

*1 Scope of data: Consolidated subsidiaries JFE Steel: 146, JFE Engineering: 80 JFE Shoji: 87
*2 As of April 1, 2022. Other figures are as of FY2021.
*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).

■ Recruiting (Three Operating Companies, Excluding their Subsidiaries) for New Graduates (FY2022) and Mid-career Recruits (FY2021)

Items	Unit	Career-track Positions			On-site and Clerical Positions	Total
		White-collar	Technical	Total		
Male	people	82	188	270	165	435
Female	people	45	18	63	28	91
Total	people	127	206	333	193	526
Ratio of women	%	35.4	8.7	18.9	14.5	17.3

■ Employment of People with Disabilities (as of June 1 of each year)

Items	Scope	Unit	2017	2018	2019	2020	2021
Employment of People with Disabilities	JFE Steel	%	2.33	2.41	2.48	2.51	2.51
	JFE Engineering	%	2.14	2.39	2.23	2.37	2.53
	JFE Shoji	%	2.20	2.62	2.50	2.39	2.39

Community

■ Social Contributions (FY2021)

Activities		Scope		Unit	Achievements
Internships		JFE Group		People	1,247
			JFE Steel	People	296
			JFE Engineering	People	666
			JFE Shoji	People	285
Supporting elementary schools in Ghana and Nigeria	Desks and chairs	JFE Shoji		Sets	700
	Notebooks			Books	17,000
	Canned foods			Cans	12,500

■ JFE 21st Century Foundation (FY2021)

Grants		Projects	Value (million yen)
Technology research (accumulated)		682	1,371.8
Technology research for FY2021	Iron and steel technology research	11	22
	Global environment and global warming prevention technology research	17	34
Asian history studies (accumulated)		150	225
Asian history studies for FY2021		12	18

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*)	2,400

* Donated to approximately 700 institutions, including elementary schools, middle schools, and libraries.

Shareholders and Investors

■ Major IR Activities (FY2021)

Major communication methods, etc.	Number of sessions	participation (people)
Investors meeting, ESG briefings	7	Approx. 1,000 persons in total
Individual interviews with institutional investors and securities analysts	As needed	Approx. 380 persons in total
Briefings for Individual investor (at the branch offices of securities firms, etc.)	2 (online)	Approx. 10,000 playbacks

■ Plant Tours and Company Briefing Sessions (FY2019*)

Activities	Scope	Number of sessions	Participants
Plant tours and company briefing sessions	JFE Steel JFE Engineering Japan Marine United	23	1,800

* This table shows FY2019 results since plant tours and company briefing sessions were canceled in FY2020 and FY2021 due to the COVID-19 pandemic.

Governance Data

Corporate Governance

■ Corporate Governance System

As of July 1, 2022

Items		Overview of the system
Organizational design type		Company with an Audit & 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, 2022

Position		Name	Significant concurrent post	Independent executive	Number of meetings of the Board of Directors attended in FY2021	Number of meetings of the Audit & Supervisory Board attended in FY2021
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%)	—

Position		Name	Significant concurrent post	Independent executive	Number of meetings of the Board of Directors attended in FY2021	Number of meetings of the Audit & Supervisory Board attended in FY2021
Director	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	—	12/12 (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%)	20/20 (100%)
		Nakaba Akimoto	Audit & Supervisory Board Member of JFE Engineering Corporation, Audit & Supervisory Board Member of JFE Shoji Corporation	—	—	—
	Outside	Isao Saiki	Partner Lawyer of Abe, Ikubo & Katayama Law Firm	○	15/15 (100%)	20/20 (100%)
		Tsuyoshi Numagami	Professor, Graduate school of Business Administration, Department of Business Administration of HITOTSUBASHI UNIVERSITY External Director of Tokyo Century Corporation	○	15/15 (100%)	20/20 (100%)
		Takuya Shimamura	Director and Chairman of AGC Inc. Independent Director of EBARA CORPORATION	○	—	—

* The number of meetings of the Board of Directors held during FY2021 differs for Mr. Toshinori Kobayashi, as he was elected for the first time as a director at the previous year's Ordinary General Meeting of Shareholders (held on June 25, 2021).
* Ms. Nakaba Akimoto and Mr. Takuya Shimamura were elected as Audit & Supervisory Board Members for the first time at the current year's Ordinary General Meeting of Shareholders (held on June 24, 2022).

■ Nomination Committee and Remuneration Committee

As of July 1, 2022

Items		Members	Chairperson	Number of meetings held during FY2021
Nomination Committee		6	Masami Yamamoto (Outside Director)	5
	Inside Director	2		
	Outside Director	2		
	Outside Audit & Supervisory Board Member	2		
Remuneration Committee		6	Nobumasa Kemori (Outside Director)	7
	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

FY2021

Executive remuneration						
Position Type	Total remuneration, etc. (million yen)	Total amount by remuneration type (million yen)				Number of Executives (members)
		Basic remuneration	Bonus	Stock remuneration		
				Linked to performance	Linked to service length	
Directors (excluding Outside Directors)	351.377	203.765	89.540	44.408	13.664	6
Audit & Supervisory Board Members (excluding Outside Audit & Supervisory Board Members)	78.335	78.335	—	—	—	2
Outside Directors/ Audit & Supervisory Board Members	91.847	91.847	—	—	—	6

Notes:

1. The number of directors (excluding outside directors) in the above table includes one director 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 133.948 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 58.072 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	208.357	208.357	110.207	56.670	31.720	9.760
Yoshihisa Kitano	Director	JFE Holdings	209.957	12.000	12.000	—	—	—
	Director	JFE Steel		197.957	98.207	58.270	31.720	9.760
Masashi Terahata	Director	JFE Holdings	114.219	114.219	64.757	32.870	12.688	3.904
Hajime Oshita	Director	JFE Holdings	110.708	8.400	8.400	—	—	—
	Director	JFE Engineering		102.308	60.768	20.800	15.860	4.880
Toshinori Kobayashi	Director	JFE Holdings	112.890	6.300	6.300	—	—	—
	Director	JFE Shoji		106.590	57.900	27.950	15.860	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, 2022

Internal control system			
Items		Number of companies (companies)	Number of people assigned (members)
Internal audit	Internal audit organization	—	169
Audit & Supervisory Board	Full-time Audit & Supervisory Board Members	29	34
	Dispatched Audit & Supervisory Board Members (part-time Audit & Supervisory Board member)	25	8
Cooperation of Audit & Supervisory Board members			
Items		Number of meeting held during FY2021	
Accounting auditor		8	
Internal Audit Department		6	

Compliance (including Anti-corruption)

■ Whistleblowing

Items	Scope	Unit	FY2019	FY2020	FY2021
Cases handled by the Corporate Ethics Hotline	JFE Holdings and operating companies	Cases	101	87	133

Independent Assurance Statement

SUSA
Sustainability Accounting Co.,Ltd.

Independent Assurance Statement

September 22, 2022

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 2021, that were 51.9 million t-CO_2 of CO_2 emissions for Scope1, 7.1 million t-CO_2 of CO_2 emissions for Scope2 and 20.8 million t-CO_2e of CO_2 emissions for Scope3 (categories 1, 2, 3, 4, 5, 6, 7, 15), 654 PJ of energy consumption, and 246 million tonnes of water accepted (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.

External ESG Evaluations

JFE Holdings is a constituent of all the Japanese equity ESG indexes selected by the Government Pension Investment Fund (GPIF), the world's largest pension fund. We are the only steel manufacturer selected as a constituent of all these indexes (as of July 2022).

FTSE Blossom Japan Index (invested in by GPIF)

JFE Holdings has been selected for three consecutive years as a constituent of the FTSE Blossom Japan Index, an investment index provided by FTSE Russell. The index selects companies that demonstrate strong environmental, social, and governance (ESG) practices and is used in the creation or assessment of sustainable investment funds or other financial products.

FTSE Blossom Japan

FTSE Blossom Japan Sector Relative Index (invested in by GPIF)

JFE Holdings has been selected as a constituent of the FTSE Blossom Japan Sector Relative Index, an investment index provided by FTSE Russell. This ESG index was adopted by 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 Sector Relative Index

MSCI Japan ESG Select Leaders Index (invested in by GPIF)

JFE Holdings has been selected 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.

2022 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 GPIF)

JFE Holdings has been selected for two 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 MSCI Japan IMI top 700 index and selecting companies from each industry that achieved high scores.

2022 CONSTITUENT MSCI JAPAN EMPOWERING WOMEN INDEX (WIN)

* 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.

S&P/JPX Carbon Efficient Index (invested in by 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.

FTSE4Good Index Series

JFE Holdings has been selected for three 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.

Evaluation Based on CDP 2021

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 350 companies responding to the questionnaires in Japan, 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. We made sure to disclose appropriate information for the CDP 2021 questionnaire, and as a result we received a high rating.

CDP 2021 score: climate change: A-, water security: A-, supplier engagement: A-

2022 Health and Productivity Stock Selection and 2022 "White 500" Organization under the 2022 Certified Health and Productivity Management Outstanding Organizations Recognition Program

JFE Holdings has been jointly selected by the Ministry of Economy, Trade and Industry (METI) and Tokyo Stock Exchange (TSE) as 2022 Health and Productivity Stock Selection. Health and Productivity Stock selects outstanding TSE listed enterprises engaged in strategic health and productivity management programs that focus on employee health from the management perspective. It is intended to introduce attractive companies to investors who prioritize the improvement of corporate value from a long-term perspective.

In addition, the Company, JFE Steel Corporation, and JFE Engineering Corporation were recognized as White 500 organizations under the 2022 Certified Health and Productivity Management Outstanding Organizations Recognition Program highlighting enterprises that practice excellent health management in cooperation with insurers. This will be is the second time in four years that the Company has been recognized as a Health and Productivity Stock Selection and a White 500 organization under the aforementioned program.

SOMPO Sustainability Index

JFE Holdings has been selected for 11 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 encompasses companies with highly evaluated ESG ratings, contributes to investor asset formation by evaluating corporate value from a long-term perspective.

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

Caterpillar Quality Assurance Certification

In FY2022, JFE Steel West Japan Work (Kurashiki District) and JFE Shoji completed an online audit under COVID-19, successfully upgrading its certification for the sixth consecutive year as Gold Level SQEP suppliers in the Supplier Quality Excellence Process, a quality certification of Caterpillar Inc., a U.S.- based construction equipment manufacturer. The program ranks suppliers for compliance with ISO 9001 standards and Caterpillar's own specifications and certifies the top firms as Platinum, Gold, Silver, or Bronze. Only a few companies in Japan have received Gold Level certification, and JFE Steel is the first blast furnace manufacturer in the world to be certified.

Receiving the Gold certification plaque

External Awards

Environmentally Sustainable Company, the 3rd ESG Finance Awards Japan

JFE Holdings was selected as an Environmentally Sustainable Company in the 3rd ESG Finance Awards Japan's Environmentally Sustainable Companies Category, presented by the Japanese Ministry of Environment.

ESG Finance Awards Japan was founded for the purpose of spreading and expanding 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 in place appropriate governance and management processes. 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.

Please see the following for further details.

➤ JFE Group selected as Environmentally Sustainable Company in the 3rd ESG Finance Awards Japan (Japanese only)
(https://www.jfe-holdings.co.jp/release/2022/03/220301.html)

Silver Award, 2022 Sustainability Site Awards

JFE Holdings won a Silver Award (excellence) at the 2022 Sustainability Site Awards selected by the Association for Sustainability Communication (formerly the Association of CSR Communication).

The award has been announced every year since 2017 as a comprehensive website research and rating carried out to survey the actual conditions of sustainability information disclosure issued through websites for listed companies in Japan. The survey is conducted by analysts with expert knowledge examining only the information disclosed on websites, and evaluated based on eight themes (over 280 criteria) for such sites. Criteria are mainly based on GRI Standards 2016 and reviewed annually in view of changes in society to maintain alignment with global trends in sustainability assessment. This recognition speaks to our efforts in enhancing the richness of our information disclosure through our website. We intend to continue to proactively engage in ESG initiatives and information disclosure.

World Steel Association 2022 Steel Sustainability Champions

JFE Steel was awarded the 2022 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.

JFE Steel formulated the JFE Group Environmental Vision for 2050 in 2021 and is developing ultra-innovative technology for reducing environmental impact. In addition, it has formulated basic policies and discloses measurement data on sustainability in areas such as the environment and occupational health and safety. The company has also identified its material issues of corporate management, set KPIs, and periodically reviewed the appropriateness of the issues and KPIs as it continued its efforts.

These endeavors were recognized with the Steel Sustainability Champions award for the second 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 2022 Steel Sustainability Champion**
(https://www.jfe-steel.co.jp/en/release/2022/220413.html)

External Awards for Research and Development

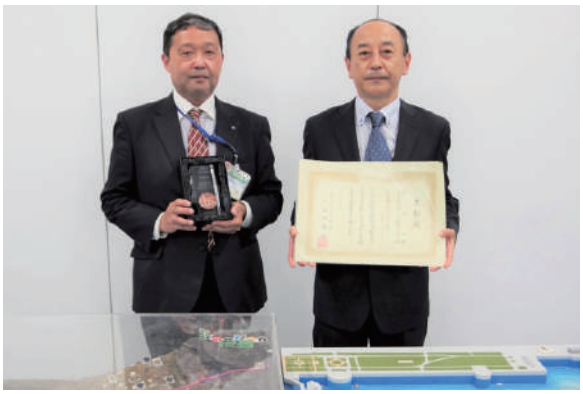
■ Awards for Technologies and Product Developments (FY2021)

	Prize/Award	Project	Sponsor
JFE Steel	FY2022 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 resource-conserving Si gradient steel sheet that contributes to energy conservation of electrical equipment	Ministry of Education, Culture, Sports, Science and Technology
	68th (FY2021) Okochi Memorial Foundation Technology Award	Development of environmentally friendly high-strength steel plate with strong anti-seismic properties that help improve resilience of Japan	Okochi Memorial Foundation
	56th Machinery Promotion Award, Japan Society for the Promotion of Machine Industry Chairman's Prize	Development of high-efficiency, ultra-narrow-groove welding system	Japan Society for the Promotion of Machine Industry
	FY2021 National Invention Award: Chairman of Japan Business Federation's Award	Invention of structural arrest for welded structures that improves safety of ships	Japan Institute of Invention and Innovation
	FY2021 Japan Society of Civil Engineers Environmental Award (Group II)	Joint research project to create abundant oceans through public-private collaboration: demonstration of improvement in marine environments with steel slag products and initiatives in environmental training	Japan Society of Civil Engineers
	FY2021 Resource Recirculation Technologies and Systems Award Director-General Award for Industrial Technology and Environment, Ministry of Economy, Trade and Industry	Establishment of closed-loop recycling technology for used refractories	Japan Environmental management Association for Industry
	FY2021 The Japan Society for Technology of Plasticity Conference Award	Development of intelligent control technology to achieve world's fastest temper rolling	The Japan Society for Technology of Plasticity
	22nd Logistics Environment Award: Special Award	Modal shift of steel transportation from Hiroshima Prefecture to Chiba Prefecture	Japan Association for Logistics and Transport
	IT Japan Award 2021 Semi-Grand Prix	Development of digital twin blast furnace that avoided problems that could have led to losses of several hundred million yen	Nikkei Computer
	Keidanren Endorsed Internal Newsletter Recommendation Award	Company Newsletter, *JFE Steel Magazine*	Company Newsletter Center, KEIDANREN Business Services
JFE Engineering	FY2021 New Energy Award Director-General's Prize, the Agency for Natural Resources and Energy (Products and Services)	BRA-ING® AI system for autonomous operations of incinerators at waste processing facilities	New Energy Foundation
	FY2021 New Technology Promotion Engineer Award	Initiative to use image recognition AI to increase sophistication of bar arrangement inspection	Kanto Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism

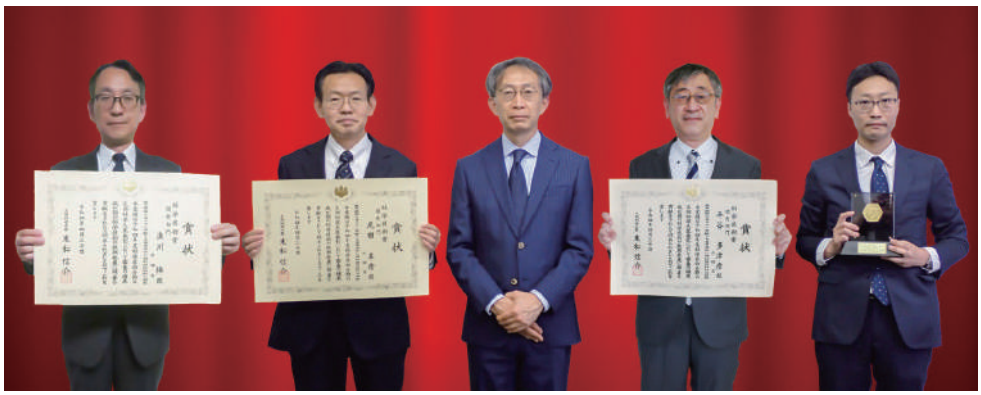
68th (FY2021) Okochi Memorial Technology Prize

56th Japan Society for the Promotion of Machine Industry President's Award (Machine Promotion Award)

FY2021 National Invention Award (Chairman of Japan Business Federation's Award)



FY2021 Japan Society of Civil Engineers Environmental Award (Group II)



FY2022 The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Awards for Science and Technology (Development Category)

Third-party Comments

Yoshinao Kozuma

Emeritus Professor
Sophia University

1. Transition Plan for Achieving Carbon Neutrality by 2050

Noteworthy efforts this fiscal year can be seen in updated information related to the TCFD. Scenario analysis is one, and this year the Company added a 1.5°C scenario, which is indispensable for ensuring consistency with the Paris Agreement. Although most of the analysis results are the same as those of the 2.0°C scenario, the new one more clearly describes the risks and opportunities involved in achieving carbon neutrality by 2050 and provides extremely useful information for assessing the resilience of the Company's strategies.

In terms of the disclosure of a transition plan in line with the 2021 edition of TCFD's Guidance, compared to the previous year, a more concrete roadmap to 2050 was presented with details of the initiatives and their target periods for achievement. In particular, the FY2030 target, which is the medium-term target for reducing CO_2 emissions in the steel business, was revised significantly upward to a reduction of 30% or more from FY2013. This will be achieved by expanding the application of existing technology and pursuing a method of transitioning to low-carbon steelmaking processes through the accumulation of new reduction approaches, making it a realistic and ambitious milestone.

2. Strengthening Initiatives for ESG Issues

The JFE Group's initiatives on ESG issues continue to evolve. In the environmental area, JFE Steel obtained certification for the Eco Leaf label for products including steel sheets for cans and construction materials, which improved the transparency of information on the environmental impact of products. In the social area, the JFE Group as a whole has decided to invest 10 billion yen per year in safety measures to eliminate serious accidents, and I hope this will lead to reinforcing future measures for human rights issues in the workplace. In terms of diversity, a new KPI has been established for the ratio of women in management positions above the level of section manager. It is also commendable that the employment ratio for women in career-track positions was raised to around the same number as men, starting with the KPIs for FY2022. These efforts have resulted in JFE Holdings becoming the first steelmaker to be included in all ESG investment indices for domestic equities used by the Government Pension Investment Fund of Japan.

3. Enhancing the Governance System

In the area of governance, I was impressed by the Company's inclusion of an indicator for employee safety in performance-linked remuneration for executives, as well as the planned introduction of a climate change indicator during the Seventh Medium-term Business Plan. I believe these reforms will contribute to achieving further growth for the JFE Group in a sustainable society.

4. Future Challenges

Because it is undesirable for the scope of financial and ESG information to differ when investors are increasingly interested in the financial impact of ESG risks, the Company should also consider disclosing social data on a consolidated basis. In addition, import bans on products made through forced labor are in progress in the U.S., Canada, and the EU, making the early establishment of a human rights risk management system in the supply chain an urgent issue.

Mariko Kawaguchi

Specially appointed professor of Graduate School of Social Design Studies, Rikkyo University

The past six years, during which I have offered third-party comments, have coincided with a period of dramatic change in the public recognition of sustainability issues. Particularly noteworthy is the major shift in the business community's understanding of climate change as a vital issue, from a long-term issue to be addressed through **low-carbon** initiatives as long as they do not negatively affect the core business to a crisis close to home that should be addressed by pursuing **decarbonization** as a management priority for the core business. In the course of reading this report, I was reminded that JFE Holdings has been leading this transformation for the past six years.

The steel industry has supported modern civilization from a material standpoint. However, from the mining of iron ore and coal as raw materials to manufacturing, distribution, and disposal, the industry has placed a tremendous burden on the global environment as well as human health and safety. With regard to this negative impact, and especially the climate crisis, President Kakigi has expressed his commitment to management by describing decarbonization as "an opportunity that will expand the fields in which JFE can take advantage of its world-class technological capabilities." It is evident from this report that his words are leading to action.

Three years ago, in FY2019, JFE became one of the first companies in Japan to formulate a TCFD scenario. Two years ago, it also formulated a CO_2 reduction roadmap toward achieving carbon neutrality. In FY2021, the Company declared its commitment to achieving carbon neutrality by 2050 under the JFE Group Environmental Vision for 2050, and it set the target of reducing CO_2 emissions by 18% from FY2013 levels in FY2024 in the Seventh Medium-term Business Plan. In this report, JFE Steel's President Kitano has personally stated that the Company had achieved a 9% reduction in FY2021 and that the FY2030 target had been revised upward to 30% or more in February of this year. I initially had doubts as to whether the steel industry, which uses coal as a raw material, was capable of taking bold low-carbon initiatives. However, I have been persuaded by JFE's strategy of realizing a low-carbon society by promoting thorough energy conservation and low-carbon technologies in its steel business while simultaneously focusing on innovative decarbonization technologies such as carbon-recycling blast furnaces and pursuing renewable energy and waste processing operations in its engineering business. This suggests that the steel industry itself has entered a new chapter in its history.

As international concern deepens over public safety and well-being due to the COVID-19 pandemic and global conflicts, business management is also reevaluating the value of people. People develop next-generation technologies while maintaining safe and clean operations at huge facilities, such as blast furnaces that operate at approximately 2,000°C, to generate profit. People are not only the source of corporate value but also important stakeholders for whom companies should provide job satisfaction and a sense of fulfillment. I believe that the JFE Group owes its success in carbon reduction initiatives to the high morale and awareness of its people. The Group's focus on human capital management has also been clearly stated in the Message from the CEO, and its management policy of addressing social issues through technology and respect for people should serve as the backbone for sustainably enhancing corporate value.

I hope you will accelerate and reinforce these efforts in the future, and I ask you to further strengthen your sustainability agenda.

First of all, I would like the JFE Group to contribute to the circular economy. In addition to bolstering the existing steel recycling business, I would like to see the Company establish the infrastructure for a circular economy by also utilizing its engineering business. Furthermore, I would like to see a comprehensive strategy for sustainability issues in mining operations for iron ore and coal. In this context, environmental issues such as conserving water resources at mining sites and biodiversity are also important. In September 2022, the Japanese government released its Guidelines on Respecting Human Rights in Responsible Supply Chains, and ensuring respect for human rights at various levels along the extensive supply chains of the steel and engineering businesses, including mining operations, will also be a key management concern.

With regard to climate change, in addition to mitigation, adaptation to cope with ongoing extreme weather events has become increasingly urgent and important. In developing resilient infrastructures, I expect there will be a heightened need for comprehensive initiatives by the JFE Group.

While this report contains a vast amount of information, editorial consideration has been given to the role of communicating an executive summary for each section and messages from the CEO and other executives in charge. I commend and support the JFE Group's decarbonization efforts and look forward to its future strategies and actions as a leader of sustainability beyond decarbonization.

Editorial Policy

Basic Approach

This report provides stakeholders with a comprehensive account of the JFE Group's CSR-related initiatives and data and elicits feedback toward enhancing the Company's activities and information disclosure. The 2022 report was compiled with a focus on the following.

- Progress of the Seventh Medium-term Business Plan and FY2021 KPI Results and FY2022 KPIs
- Development of a concrete roadmap for achieving carbon neutrality by 2050, transition pathway
- Results of initiatives aimed at addressing global 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
- Results of human rights due diligence and future initiatives
- New KPIs for diversity and inclusion, and initiatives at operating companies
- Introduction of non-financial metrics to executive remuneration

Scope of Report

Reporting Period

FY2021 (April 1, 2021 to March 31, 2022)
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 (412 companies, of which 330 are consolidated subsidiaries and 82 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 29 domestic and overseas consolidated subsidiaries (total: 30 companies)

23 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 Pipe Fitting Mfg. Co., Ltd., 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, JFE Ferrite Corporation

6 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, Nucor-JFE Steel México, S. de R.L. de C.V.

JFE Engineering Group: JFE Engineering Corporation and 13 domestic and overseas consolidated subsidiaries (total: 14 companies)

12 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 Corporationn, JFE Project One 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, and 2020
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 2022, PDF file: September 2022
(previous report: October 2021, next report: scheduled for September 2023)

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 CSR activities, corporate governance, etc.

Guideline Content Indices

GRI Standard Content Index

This report is prepared with reference to the GRI Sustainability Reporting Standards 2016/2018/2019/2020

Note: We refer to JFE GROUP REPORT 2022 (Integrated Report), Securities Report from April 1, 2021 to March 31, 2022) and Corporate Governance Report as of June 24, 2022.

■ GRI 102: General Disclosures 2016

Disclosure		Pages	
		Report	Other
1. Organizational profile			
102-1	Name of the organization	—	➤ Overview of JFE Holdings (https://www.jfe-holdings.co.jp/en/company/info/index.html)
102-2	Activities, brands, products, and services	—	JFE GROUP REPORT (Integrated Report): pp.29-32
102-3	Location of headquarters	—	➤ Overview of JFE Holdings (https://www.jfe-holdings.co.jp/en/company/info/index.html)
102-4	Location of operations	—	➤ About JFE Group (https://www.jfe-holdings.co.jp/en/company/g-about/index.html)
102-5	Ownership and legal form	—	➤ Overview of JFE Holdings (https://www.jfe-holdings.co.jp/en/company/g-about/index.html)
102-6	Markets served	—	➤ Overview of JFE Holdings (https://www.jfe-holdings.co.jp/en/company/info/index.html) ➤ About JFE Group (https://www.jfe-holdings.co.jp/en/company/g-about/index.html)
102-7	Scale of the organization	➤ Social Data (P.225)	JFE GROUP REPORT (Integrated Report): pp.27-28, pp.35-36, pp.42-43, pp.97-98, p.102
102-8	Information on employees and other workers	➤ Social Data (P.225)	JFE GROUP REPORT (Integrated Report): p.103
102-9	Supply chain	➤ JFE Group Value Chain (P.29)	—
102-10	Significant changes to the organization and its supply chain	Not applicable	—
102-11	Precautionary Principle or approach	➤ Challenge to the Carbon Neutrality and its Pathway in the Steel Business (P.45) ➤ Environmental Management (P.50) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.84) ➤ Risk Management (P.202)	—

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102-13	Membership of associations	➤ Steel Industry Initiatives (P.96)	—
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102-15	Key impacts, risks, and opportunities	➤ Message from the CEO (P.1) ➤ JFE Group Value Chain (P.29) ➤ Material Issues of Corporate Management (P.15) ➤ Challenge to the Carbon Neutrality and its Pathway in the Steel Business (P.45) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.84)	—
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102-17	Mechanisms for advice and concerns about ethics	➤ Compliance (P.198)	JFE GROUP REPORT (Integrated Report): p.80
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102-20	Executive-level responsibility for economic, environmental, and social topics	➤ CSR Structure (P.23)	—
102-21	Consulting stakeholders on economic, environmental, and social topics	➤ CSR Structure (P.23) ➤ Compliance (P.198)	—
102-22	Composition of the highest governance body and its committees	➤ Corporate Governance (P.187)	JFE GROUP REPORT (Integrated Report): pp.67-68, pp.75-77, pp.83-84
102-23	Chair of the highest governance body	—	Corporate Governance Report: p.8
102-24	Nominating and selecting the highest governance body	➤ Corporate Governance (P.187)	JFE GROUP REPORT (Integrated Report): pp.75-77
102-25	Conflicts of interest	➤ Corporate Governance (P.187)	Corporate Governance Report: p.2
102-26	Role of highest governance body in setting purpose, values, and strategy	—	—
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102-28	Evaluating the highest governance body's performance	➤ Corporate Governance (P.187)	—
102-29	Identifying and managing economic, environmental, and social impacts	➤ CSR Structure (P.23) ➤ Environmental Management (P.50)	—
102-30	Effectiveness of risk management processes	➤ Risk Management (P.202)	—
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102-35	Remuneration policies	➤ Corporate Governance (P.187)	JFE GROUP REPORT (Integrated Report): pp.78-79
102-36	Process for determining remuneration	➤ Corporate Governance (P.187)	JFE GROUP REPORT (Integrated Report): pp.78-79
102-37	Stakeholders' involvement in remuneration	—	—
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102-45	Entities included in the consolidated financial statements	➤ Editorial Policy (P.248)	—
102-46	Defining report content and topic Boundaries	➤ Editorial Policy (P.248)	—
102-47	List of material topics	➤ Material Issues of Corporate Management (P.15)	—
102-48	Restatements of information	➤ Environmental Data (P.207)	—
102-49	Changes in reporting	➤ Editorial Policy (P.248)	—
102-50	Reporting period	➤ Editorial Policy (P.248)	—
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102-52	Reporting cycle	➤ Editorial Policy (P.248)	—

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102-53	Contact point for questions regarding the report	➤ Submit Comments on the JFE Group CSR Report (Japanese Only) (https://www.jfe-holdings.co.jp/csr/pdf/form_er2022j.html)	➤ Contact Us (https://www.jfe-holdings.co.jp/en/contact.html)
102-54	Claims of reporting in accordance with the GRI Standards	Reference	—
102-55	GRI content index	This table	—
102-56	External assurance	➤ Independent Assurance Statement (P.236)	—

■ GRI103：Management Approach 2016

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		Report	Other
GRI-103: Management Approach			
103-1	Explanation of the material topic and its Boundary	➤ Material Issues of Corporate Management (P.15)	—
103-2	The management approach and its components	➤ Material Issues of Corporate Management (P.15) ➤ CSR Structure (P.23) ➤ Supply Chain Management (P.43) ➤ Environmental Management (P.50) ➤ Climate Change (P.56) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.84) ➤ Prevention of Pollution (P.128) ➤ Efficient Use of Resources (P.120) ➤ Water Security (P.125) ➤ Biodiversity (P.133) ➤ Responsibility to Customers (Provide Quality Products and Enhance Customer Satisfaction) (P.141) ➤ Occupational Health and Safety (P.148) ➤ Labor Standards (Recruit and Nurture Diverse Human Resources) (P.157)	—
103-3	Evaluation of the management approach		

■ GRI200: Economic topics

Disclosure		Pages	
		Report	Other
GRI-201: Economic Performance 2016			
201-1	Direct economic value generated and distributed	➤ Environmental Management (P.50) ➤ Community (P.175)	Securities Report: pp.2-3 (Transition of Key Management Indicators, etc.), p.14 (Status of Employees), p.53 (Dividend Policy), p.88 (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.84) ➤ Environmental Management (P.50)	—
201-3	Defined benefit plan obligations and other retirement plans	—	Securities Report: p.100 (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.50) ➤ Community (P.175)	—
203-2	Significant indirect economic impacts	➤ Message from the CEO (P.1) ➤ JFE Group Value Chain (P.29) ➤ Material Issues of Corporate Management (P.15) ➤ Challenge to the Carbon Neutrality and its Pathway in the Steel Business (P.45) ➤ Climate Change (P.56)	—
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.198)	—
205-3	Confirmed incidents of corruption and actions taken	—	—
GRI-206: Anti-competitive Behavior 2016			
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	—	—

Disclosure		Pages	
		Report	Other
GRI-207: Tax 2019			
207-1	Approach to tax	➤ Tax Trancparency (P.206)	—
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	—	—

■ **GRI300: Environmental topics**

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GRI-301: Materials 2016			
301-1	Materials used by weight or volume	➤ Environmental Data (P.207)	—
301-2	Recycled input materials	➤ Efficient Use of Resources (P.120) ➤ Environmental Data (P.207)	—
301-3	Reclaimed products and their packaging	➤ Efficient Use of Resources (P.120) ➤ Environmental Data (P.207)	—
GRI-302: Energy 2016			
302-1	Energy consumption within	➤ Climate Change (P.56) ➤ Environmental Data (P.207)	—
302-2	Energy consumption outside of the organization	—	—
302-3	Energy intensity	➤ Climate Change (P.56) ➤ Environmental Data (P.207)	—
302-4	Reduction of energy consumption	➤ Climate Change (P.56) ➤ Environmental Data (P.207)	—
302-5	Reductions in energy requirements of products and services	➤ Steel Industry Initiatives (P.96)	—
GRI-303: Water and Effluents 2018			
303-1	Interactions with water as a shared resources	➤ Water Security (P.125)	—
303-2	Management of water discharge-related impacts	➤ Prevention of Pollution (P.128) ➤ Environmental Data (P.207)	—
303-3	Water withdrawal	➤ Water Security (P.125) ➤ Environmental Data (P.207)	—
303-4	Water discharge	➤ Environmental Data (P.207)	—
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304-2	Significant impacts of activities, products, and services on biodiversity	➤ Biodiversity (P.133)	—
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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.56) ➤ Environmental Data (P.207)	—
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305-5	Reduction of GHG emissions	➤ Climate Change (P.56) ➤ Environmental Data (P.207)	—
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305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	➤ Prevention of Pollution (P.128) ➤ Environmental Data (P.207)	—
GRI 306: Waste 2020			
306-1	Waste generation and significant waste-related impacts	➤ Environmental Data (P.207)	—
306-2	Management of significant waste-related impacts	➤ Efficient Use of Resources (P.120) ➤ Environmental Data (P.207)	—
306-3	Waste generated	➤ Efficient Use of Resources (P.120) ➤ Environmental Data (P.207)	—
306-4	Waste diverted from disposal	➤ Efficient Use of Resources (P.120) ➤ Environmental Data (P.207)	—
306-5	Waste directed to disposal	➤ Efficient Use of Resources (P.120) ➤ Environmental Data (P.207)	—

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GRI-307: Environmental Compliance 2016			
307-1	Non-compliance with environmental laws and regulations	➤ Environmental Management (P.50)	—
GRI-308: Supplier Environmental Assessment 2016			
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308-2	Negative environmental impacts in the supply chain and actions taken	—	—

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GRI-401: Employment 2016			
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401-3	Parental leave	➤ Social Data (P.225)	—
GRI-402: Labor/Management Relations 2016			
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403-3	Occupational health services	➤ Occupational Health and Safety (P.148)	—
403-4	Worker participation, consultation, and communication on occupational health and safety	➤ Occupational Health and Safety (P.148)	—
403-5	Worker training on occupational health and safety	➤ Occupational Health and Safety (P.148)	—
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404-2	Programs for upgrading employee skills and transition assistance programs	➤ Labor Standards (Recruit and Nurture Diverse Human Resources) (P.157)	—
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GRI-410: Security Practices 2016			
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411-1	Incidents of violations involving rights of indigenous peoples	—	—
GRI-412: Human Rights Assessment 2016			
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GRI-413: Local Communities 2016			
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GRI-414: Supplier Social Assessment 2016			
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Comparison with Environmental Reporting Guidelines 2018 (Ministry of the Environment, Japan)

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	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.29) ➤ Challenge to the Carbon Neutrality and its Pathway in the Steel Business (P.45) ➤ Climate Change (JFE Group Environmental Vision for 2050) (P.56) ➤ Climate Change (JFE Group's Climate Change Strategy) (P.61) ➤ Scenario Analysis in Line with the TCFD Recommendations (P.84)
	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.202) ➤ Environmental Management (P.50) ➤ Climate Change (Risk Management) (P.77)
	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.15) ➤ Challenge to the Carbon Neutrality and its Pathway in the Steel Business (P.45) ➤ Climate Change (Metrics and Targets) (P.78)
	b. Disclose Scopes 1 and 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions and related risks	➤ Climate Change (Metrics and Targets) (P.78) ➤ Environmental Data (P.207)
	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.15) ➤ Climate Change (JFE Group Environmental Vision for 2050) (P.56) ➤ Climate Change (Metrics and Targets) (P.78)