

Initiatives to Create Value

At the JFE Group, we are collectively working on the Seventh Medium-term Business Plan and the JFE Group Environmental Management Vision for 2050. In this section, we introduce the specific measures being undertaken in each organization with a focus on their progress in these initiatives.

- 41 Initiatives to Create Value
- 43 Business Model (Steel Business and Trading Business)
- 45 Business Model (Engineering Business)
- 47 Business Strategies
 - 47 Steel Business
 - 50 Engineering Business
 - 53 Trading Business
 - 55 Shipbuilding Business
- 56 Annual Highlights
- 57 Helping to Resolve Issues Related to Climate Change
- 63 Intellectual Property Activities
- 64 Promotion of DX
- 65 Securing and Training Diverse Talent

Use

サス鉄ナブル!

Sus-tetsu-nable!*

* A term unique to our Company, it combines steel and sustainability, both of which are essential to society

Steel continues to provide long-lasting support in everyone's lives!

Steel is an indispensable material in daily life and is used across a wide range of industries.

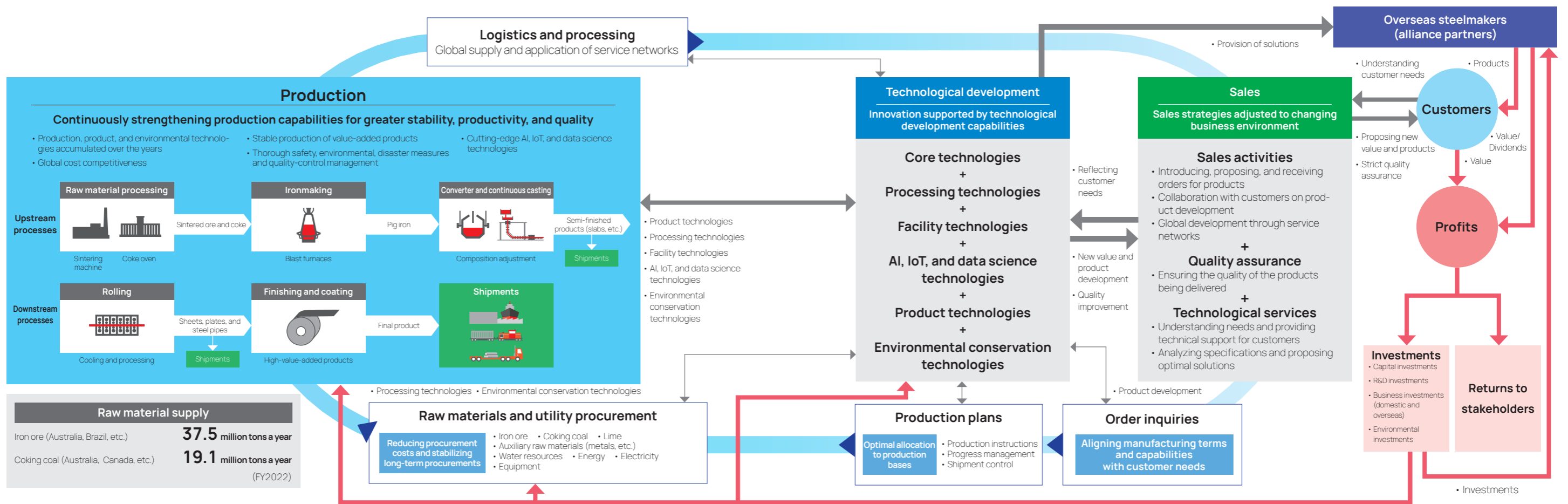


For more details, please see The Value of Steel P.7-8

Business Model (Steel Business and Trading Business)

A business model that creates a JFE brand associated with high added value

The competitive advantages of JFE's steel and trading businesses are on three fundamental capabilities: (1) **leading-edge technological development capabilities focused on customer needs**, (2) **production capabilities constantly being developed and enhanced at production sites**, and (3) **sales capabilities underpinned by solid relationships of trust with customers established over years by JFE Steel and JFE Shoji**. We create new value tailored to customer needs and provide optimized solutions based on these three strengths. These competitive advantages, treasured assets accumulated through many decades of effort and not easily matched by other companies, are the driving force behind our sustainable growth.



Steel business overview

JFE provides highly functional steel products to customers worldwide as a blast furnace steelmaker with operations of the integrated steelworks, where it can produce final products from iron ore as raw materials. As a global strategy, we are expanding solutions-oriented businesses and deepening our "insider business" model,* starting with the overseas steelmakers in our alliance.

* In overseas markets accelerating, we invest in leading partners with local credibility, and locally process and sell steel manufactured by these partners.

JFE Steel's production bases

Trading business overview

The JFE Shoji Group is engaged in businesses ranging from steel materials, machinery, non-ferrous metals, chemicals, biomass fuels, and ships to food and electronics, with an overarching focus on steel products. Through a global network encompassing 97 companies, JFE Shoji provides services that add value to supply chain operations.

Business Model (Engineering Business)

Business model that strongly supports the lives of people

The sources of our competitive edge in the engineering business are (1) our engineering capabilities (engineering, procurement, and construction (EPC)) centered on building infrastructure that supports industry and human life, and (2) know-how to operating, maintenance & managing accumulated over the years, especially in waste-to-energy power generation and waterworks plants, which (3) paired with our diverse human resources and DX projects, leads to more abundant life in the future. Leveraging these three advantages, we aim to help the world become carbon neutral while promoting a circular economy. We aim to be an engineering company that is constantly leading the world and adapting to the change of the times.

As long as people in the world long for more comfortable and abundant life, there will never be an end to our mission. We will provide optimal solutions for society and strive to realize a sustainable society.

The source of competitive advantages that reinforce our business model

Measures P.50

Engineering, procurement, and construction

Project execution capabilities with abundant experience and global structure

In a variety of fields, such as energy, the environment, and bridges, JFE has constructed numerous highly functional and high-quality structures that satisfy customer needs, covering everything from engineering to project handover. Moreover, we will strengthen our competitiveness by building out a global engineering system at overseas bases.

Operating business

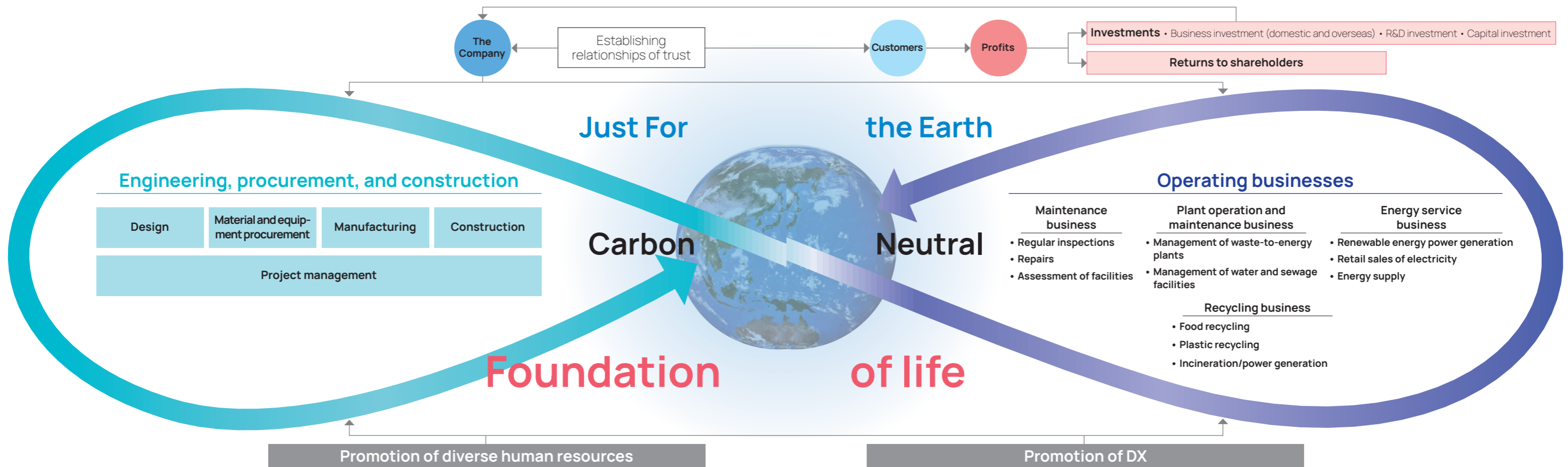
Business management capabilities with strengths in manufacturing expertise

We have accumulated operational know-how in plants in particular, such as waste-to-energy power generation and waterworks, and in the public services field, the company has an extensive track record in public-private projects. We also engage in our own recycling operations and renewable energy power generation business, and are expanding our presence in operation & maintenance business domains around the world.

Diverse human resources and DX

Diverse human resources to support the business and promotion of DX to support the evolution of the company

Approximately 40% of our employees have diverse backgrounds, such as women, foreign nationals, and mid-career hires. We also strive to create work environments that draw out the best abilities of each and every employee. We support the advancement of "creation" and "responsibility" while digitalizing operations with AI and IoT.



Business overview

By focusing on these business fields, which are needed around the world all the time, we propose integrated services from business planning to EPC and operating businesses.

Environment



- Waste-to-energy plants
- Industrial waste processing

Recycling



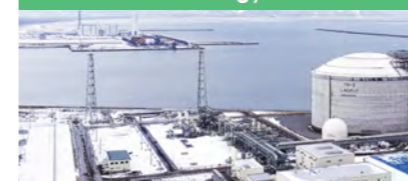
- Food waste recycling
- Plastic recycling
- Incineration/power generation

Water



- Water and sewage treatment plants
 - Water and sewerage pipelines
- Note: JFE Engineering Corporation's aqua engineering business in Japan (excluding overseas business and steel pipe business for water pipeline) was transferred to TSUKISHIMA JFE AQUA SOLUTION CO., LTD. on October 1, 2023 through the corporate divestiture.

Energy



- LNG terminals
- Oil and gas pipelines
- Chemical plants

Power generation and retail



- Electricity retailing
- Renewable energy power generation
- Energy service provider

Steel structures and industrial machinery



- Transportation and logistics infrastructure (Bridges, ports, and harbor facilities)
- Disaster prevention infrastructure (Seawalls and breakwaters)
- Industrial machinery (Cranes and steam turbines)

Steel Business

JFE Steel Corporation

Transformation toward carbon neutrality while shifting from quantity to quality

JFE Steel is accelerating the development of technologies for becoming carbon neutral and adapting to structural changes in the business environment. The company is establishing a solid yet lean business structure while shifting from quantity to quality. In order to remain essential to society, JFE Steel aims to sustain growth over the medium to long term by establishing economic sustainability in addition to environmental and social sustainability.



Yoshihisa Kitano

President and CEO
JFE Steel Corporation

Key measures in the Seventh Medium-term Business Plan and fiscal 2024 earnings targets

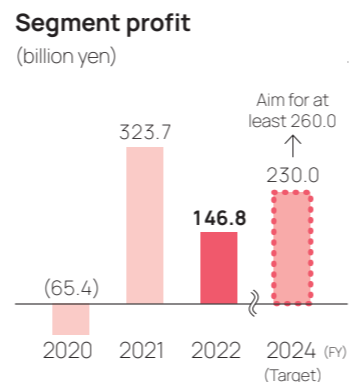
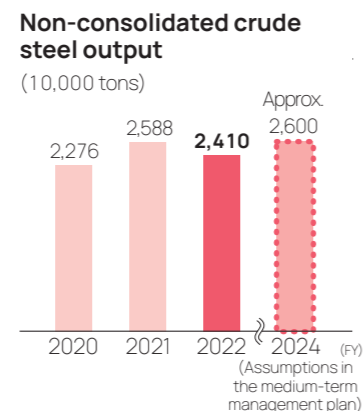
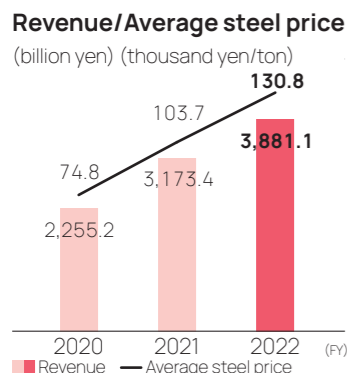
1. Transition to a lean, robust business structure by shifting focus from quantity to quality
2. Pursue innovation aimed at achieving carbon neutrality
3. Use digital technologies to strengthen production bases and achieve new growth
4. Expand and accelerate overseas business via solutions based on knowledge, skills, and data

Per-ton profit*1
10,000 yen/ton
(Target segment profit of 230.0 billion yen*2)

*1 Segment profit / unconsolidated sales volume in tons
*2 Target of at least 260.0 billion yen by the final year of the medium-term management plan

Strengths	Threats and risks	Opportunities
<ul style="list-style-type: none"> World-class technologies that reduce environmental load and contribute to carbon neutrality World-class production technologies for high-value-added products Abundant world-leading technologies and operational/research know-how Cutting-edge AI, IoT, and data science technologies to evolve the company through DX Extensive customer base built up over the decades, alliances with steelmakers around the world 	<ul style="list-style-type: none"> Long-term decline in domestic steel demand Local production for local consumption of steel in emerging countries Anti-globalization movement around the world Uncertain outlook for the global economy due to Russia's invasion of Ukraine Rising commodity prices, including energy and logistics costs 	<ul style="list-style-type: none"> Stronger demand for eco-products and solutions that help reduce CO₂ emissions Increasing demand for high-grade steel due to the shift to lighter and electric vehicles and greater safety and durability Increasing demand for steel materials due to medium- and long-term growth in emerging countries, and needs for operational and environmental technical assistance from local steelmakers Increasing demand for infrastructure for natural disaster prevention and replacement to make Japan more resilient Top global runner in carbon-free manufacturing processes

Fiscal 2022 results



Initiatives in Fiscal 2022

In fiscal 2022, the demand environment saw delays in the recovery of activity levels in the automotive sector due to supply constraints in semiconductors and other parts, as well as the postponement of projects in the construction and civil engineering sectors due to soaring raw material costs. Overseas, demand for steel also lacked strength due to uncertainties in China's domestic demand and the European economy. While being confronted by issues like the weaker yen and rising prices for energy and other commodities, JFE Steel took measures to correct price levels through early reflection of primary material costs in prices, passing higher costs onto prices, and revising extras.

In addition, with an eye on structural reforms, we carried out key measures as planned, including suspending facilities in the Chiba

district to consolidate production of steel sheets for cans in the Fukuyama district in the first half of the fiscal year, and completing the revamp of the No. 6 blast furnace at the Chiba district in the second half.

Regarding efforts to strengthen production bases through digitalization, JFE Steel is steadily advancing DX initiatives with the latest digital technologies, including completing a refresh of core systems at the Sendai Works, our first production base to do so.



Chiba No. 6 blast furnace

Medium- to Long-term Strategy and Future Initiatives

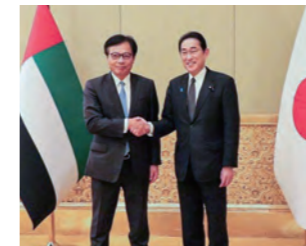
● Pursuing Structural Reforms

Aiming to transform into a lean and resilient company, JFE Steel has undertaken a series of structural reforms. In September 2023, we completed the suspension of upstream processes and hot-rolled steel facilities in the Keihin district. In fiscal 2023, management anticipates a boost of 33.0 billion yen from cost reductions, including major cuts in fixed costs as a result of selective concentration aimed at reinforcing competitiveness. Based on OHGISHIMA 2050, unveiled in September 2023, JFE Steel is examining the use of land after the suspension of facilities.

● Carbon-neutral Initiatives

Aiming for carbon neutrality by 2050, we have commenced the construction of various prototype furnaces in the Chiba district, such as a carbon-recycling blast furnace, a hydrogen direct-reduction steel-making furnace, and an electric arc furnace, in a project to test the use of hydrogen in the steelmaking process, which was selected as a New Energy and Industrial Technology Development Organization (NEDO) Green Innovation Fund Project. JFE Steel will continue to research and develop several ultra-innovative technologies like these. We consider the period up to 2030 as a transition phase, during which we are working to reduce carbon emissions in our processes. For example, JFE Steel is cutting CO₂ emissions by introducing the eco-friendly Double-slag Refining Process (DRP®), a converter-type, molten-iron pretreatment process that makes existing steel-making processes more environmentally friendly by allowing extra scrap to be used in converters. We are also expanding the use of electric arc furnaces by increasing the capacity of electric arc furnaces at the Sendai Works and examining the introduction of high-efficiency, large-scale electric arc furnaces in the Kurashiki district. From fiscal 2023, we started supplying JGreeX™, green steel materials that feature significantly reduced CO₂ emissions in the steelmaking process.

Regarding initiatives aimed at the innovation phase after 2030, JFE Steel will conduct demonstration tests of technologies for effectively utilizing CO₂, such as R&D in technologies for fixating CO₂ in steel slag, and the construction of CO₂ methanol



Prime Minister Fumio Kishida (right) and JFE Steel President Yoshihisa Kitano (left) at the UAE signing ceremony

synthesis prototype facilities in the Fukuyama district. Overseas, we will conduct a business feasibility study for building a low-carbon reduced-iron supply chain in the UAE. We will also collaborate on a joint study about constructing a CCS value chain that originates in Japan, aligned with a joint study on CCS in Malaysia.

● Transition from Quantity to Quality

JFE Steel is steadily progressing in its shift from quantity to quality in sales. The sales ratio of high-value-added products has risen from 40% in fiscal 2020 to approximately 47% in fiscal 2022, moving as planned toward our fiscal 2024 target of 50%. In fiscal 2023, we will begin supplying J-TerraPlate™, large and heavy steel plates for off-shore wind power generation, and we plan to finish the expansion of production facilities in the second half. In electrical steel, JFE Steel has decided to expand capacity even more, in addition to ongoing facility upgrades, strengthening its supply system for top-grade non-oriented electrical steel sheet for use in the main motors of EVs, which only a few steelmakers in the world can produce.

Thanks to our efforts to correct selling prices and structural reforms to reduce fixed costs, we expect to achieve our medium-term target of 10,000 yen per ton in profit, excluding inventory valuation differences, in fiscal 2023.

● Overseas Business Strategy

In fiscal 2023, we will delve deeper into the "insider" business, such as by entering into a joint venture agreement with JSW Steel for the establishment of a joint venture in India that specializes in grain-oriented electrical steel sheet. JFE Steel will contribute to the growth of the Indian economy through the establishment of the country's first integrated steel production system and supplying energy-efficient electrical steel sheets.

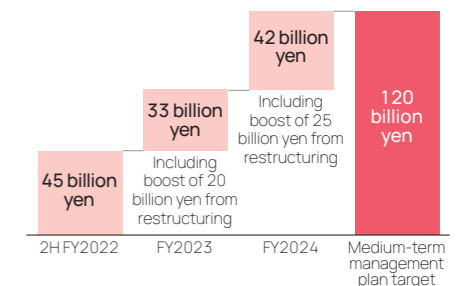
● DX, Solution Business

As part of the DX solutions business JFE Steel aims to automate operations with a unified approach to DX, conducting self-driving vehicle tests at its steelworks, and advancing the use of robotics at production sites. Additionally, along with IBM Japan, JFE Steel has started sales activities for J-mAlster®, an AI-powered system to support recovery from control failures, expanding its solution business for customers in Japan and overseas.

Progress on restructuring and major capital investment plans

Facilities	FY2021	FY2022	FY2023	FY2024-
Shutdown of tin mills in Chiba Consolidation at Fukuyama district		Shutdown (Aug. 2022) (No. 2 Tandem Mill, No. 4 CAL, TFL)		
Blast furnace (BF) revamp	Kurashiki Revamp No. 4 BF (-Dec. 2021)	Chiba Revamp No. 6 BF (Sep. 2022-Jan. 2023)		
Shutdown of upstream hot-rolling facilities in Keihin			Shutdown (Sep. 2022)	
Keihin land utilization		Selection of business partner for north side of north area of Minamiwatarida (Mar. 2023)	Unveiling of OHGISHIMA 2050 (Sep. 2023)	Ohgimachi land sale (Dec. 2024)

Progress on cost reductions (actions + structural reforms)



TOPICS

Carbon Neutral

Launch of Green Steel Material JGreeX™

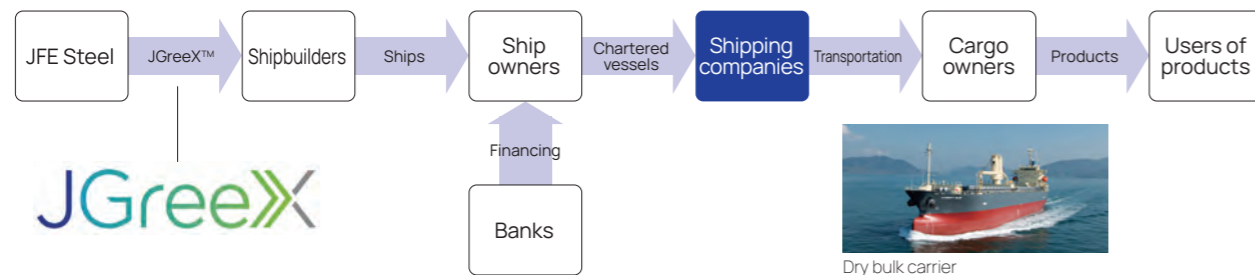
JFE Steel has started to supply JGreeX™, a green steel material that significantly reduces CO₂ emissions in the production process compared to conventional products. Given the current hardships faced in supplying green steel materials that substantially reduce or eliminate CO₂ emissions, JFE Steel first obtained third-party certification of the amount of CO₂ reduced as a result of its CO₂ emissions reduction technologies. Using the mass balance method (see page 58), JFE Steel allocated this certified reduction in CO₂ emissions to specific steel materials, thereby enabling the supply of green steel.

Adoption Cases

JGreeX™ has been adopted by several shipping companies for use in the planned construction of cargo ships (dry bulk carriers). Plans call for JGreeX™ to be used for all steel materials in the construction of these dry bulk carriers, making them the world's first ships to be built solely with green steel. Moreover, this project, jointly carried out by the shipping companies and the JFE Steel, which is also a cargo owner, is

the first one in the world to use a new business model where the value from CO₂ emissions reductions is distributed across the supply chain for the benefit of society. Understanding that the environmental value of CO₂ emissions reductions is crucial for the widespread adoption of green steel throughout society, we will continue to promote activities to gain recognition for this environmental value.

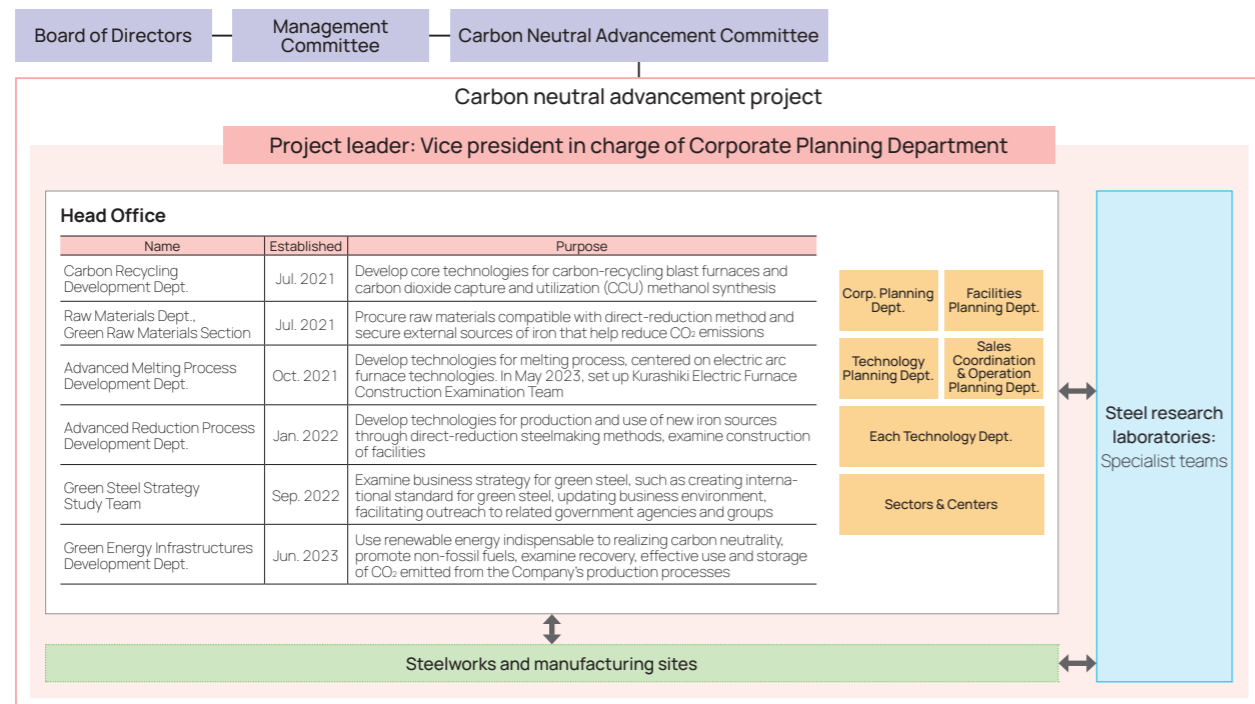
Business Model



Carbon Neutral

Organizational Structure for Achieving Carbon Neutrality by 2050

To achieve carbon neutrality by 2050, JFE Steel established a cross-organizational project team directly under the president in October 2020 to advance various initiatives to develop and implement technologies. Since July 2021, we have set up a number of specialist teams to accelerate these initiatives.



Engineering Business

JFE Engineering Corporation

Becoming an engineering company that contributes to the achievement of the SDGs with the mission of foundation of life

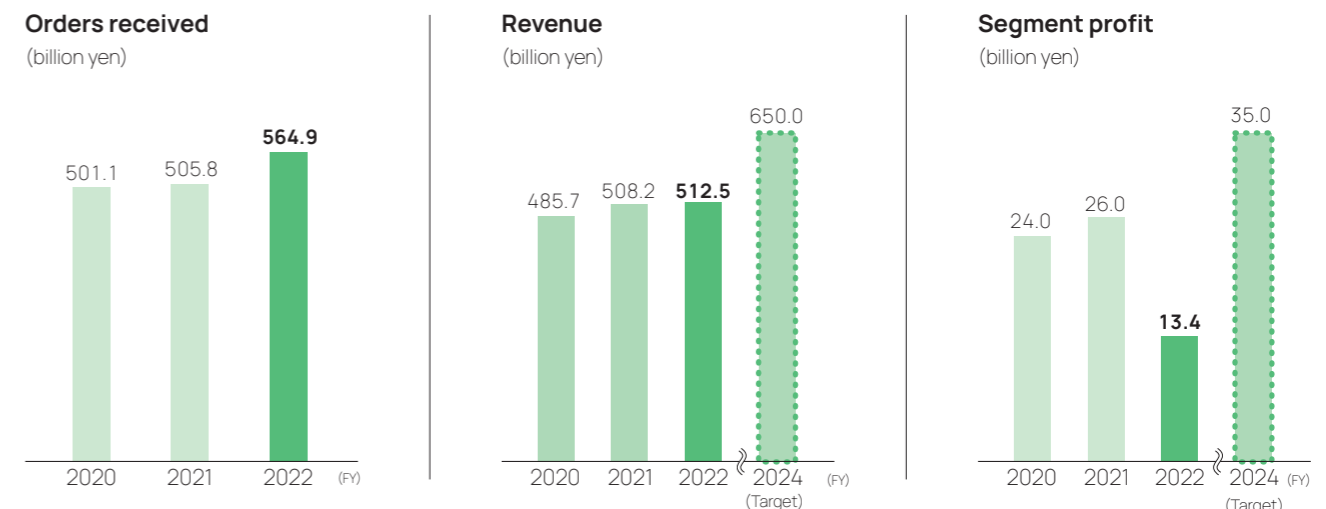
When formulating a medium- to long-term strategy targeting the year 2030, JFE Engineering came up with its purpose called "foundation of life," Just for the Earth. We strongly back people's lives and the creation of a safe society for current and future generations. Driven by a mission of "Just for the Earth," the entire company is working diligently to contribute to the achievement of the SDGs and achieve its targets in the Seventh Medium-term Business Plan.



Hajime Oshita
President and CEO
JFE Engineering Corporation

Strengths	Threats and risks	Opportunities
<ul style="list-style-type: none"> Track record and technological capabilities in the broader infrastructure business Track record and technological prowess in the environmental, recycling, and renewable energy fields Stable earnings foundation thanks to expansion in the O&M business Integrated provision of utilities (water, electricity, gas, etc.) 	<ul style="list-style-type: none"> Contraction in domestic public works projects in line with government aims and policies Increase in construction costs due to changes in prices for equipment and materials Decline in EPC projects due to fall in private-sector capital investment Uncertainties in the global economy caused by geopolitical risks, such as Russia's invasion of Ukraine 	<ul style="list-style-type: none"> Greater social expectations for SDGs achievement Stronger demand for infrastructure upgrades and service life extension Changes in social structure with privatization of public services Growing needs for renewable energy

Fiscal 2022 results



Key measures in the Seventh Medium-term Business Plan and fiscal 2024 earnings targets

1. Enhance medium- to long-term priority areas as growth fields

- Waste to resources
- Carbon neutral
- Combined utility services
- Infrastructure

2. Expand overseas operations by developing business in tune with local needs

3. Advance DX projects for all engineering work

Revenue

650.0 billion yen

Segment profit

35.0 billion yen

Initiatives in Fiscal 2022

JFE Engineering expanded the operation and maintenance (O&M) business that is responsible for upholding the foundation of our life in public-private partnership (PPP) operations, the power generation and electricity business, and the recycling business, in addition to the traditional engineering, procurement, and construction (EPC) business.

In the EPC business, as a "creation" business of the foundation of life, JFE Engineering received record-high orders, the most since it was founded, marking steady progress in winning major projects, especially in its fields of expertise, centered on core infrastructure fields in Japan and overseas: environmental plants, pipelines, and bridges.

In O&M businesses, JFE Engineering is addressing future issues, such as labor shortages and the passing down of technical expertise, while expanding and advancing remote monitoring bases with DX technology in the O&M and related businesses with a focus on environmental plants. In the combined utility services field, JFE Engineering supplies heat and electricity through the installation of gas cogeneration systems at the production plants of food

companies. The company received orders in the energy service business, which is involved in electric power interchange at 10-19 bases within Japan. In Sendai City, J&T Recycling Corporation, a Group company in charge of the recycling business, participates in a recycling operation for plastic waste, the first of its kind in Japan, based on the Plastic Resource Recycling Promotion Act. It is also expanding bases in the recycling business, such as launching a food recycling operation in Komaki City, Aichi Prefecture. By expanding our O&M businesses, we aim to establish a corporate structure with earnings that are less susceptible to fluctuations in orders for projects.

In overseas operations, we posted a new record high in total orders for overseas projects, winning orders for a chemical plant in Singapore, LNG receiving facility in Taiwan, a wastewater treatment plant in Indonesia, a bridge in Africa, and other major EPC projects in new areas.

Leveraging our accumulated technologies and know-how, we have expanded and advanced business domains related to "creation," "responsibility," and "connections" to the future as the foundation of life.

Medium- to Long-term Strategy and Future Initiatives

JFE Engineering focuses its efforts on the following five major fields in its medium- to long-term strategies formulated in fiscal 2021.

The first is **the waste to resources field**. With the intention of creating a business model centered on thoroughly using waste, we will build a rock-solid earnings foundation by steadily expanding assets over the long term and tapping into demand for replacing aging waste-to-energy power facilities. Overseas, we are accelerating the development of O&M businesses, in addition to EPC projects. In the recycling business, we have identified three core businesses with strong social needs: food recycling, plastic recycling, and waste incineration / power generation. We aim to aggressively invest in and develop these core businesses nationally.

The second one is **the carbon neutral field**. In addition to solar and biomass power generation that we have focused on, we are strengthening our presence in the fields of offshore wind power and geothermal power generation. In the offshore wind power field, we will construct a new plant to manufacture foundational structures attached to the seabed, an area of expertise. JFE Engineering is also accelerating the development of carbon-recycling technology by

leveraging its accumulated know-how in incineration technology.


The third field is **combined utility services**. As an O&M business that is a "responsible" foundation of life, JFE Engineering comprehensively provides utility services (water, electricity, and gas) to regions, including heat supply services, through the launch of new local electric power companies and participation in concessions for the privatization of waterworks services, which has expanded in recent years.

The fourth field is **infrastructure**. JFE Engineering is developing and introducing new products, construction methods, and materials that address needs to maximize the use of already built infrastructure, by reinforcing and extending the service life of infrastructure such as bridges, gas plants, waterworks systems, and pipelines.

DX projects are the fifth field. We are advancing the use of digital technology in all kinds of engineering work. In addition to increasing the efficiency of work, our aim is to widely reform work processes and provide digital twin and digital services that utilize AI and IoT, such as adding new functionality to products and services.

Business fields for medium- to long-term initiatives

Field	Main Applicable Businesses	Revenue Target for fiscal 2024
Waste to resources	Establish stable profit base in the domestic environment business Priority investment and expansion of domestic market in the recycling business—Food, plastic, incineration, and power generation	290 billion yen
Carbon neutral	Put priority in renewable energy (offshore wind power generation, biomass power plant, solar power plant, geothermal power plant, etc.) Develop carbon-neutral technologies	80 billion yen
Combined utility services	Shift to comprehensive business model, including for efficient operation of facilities to contribute to energy savings and decarbonization	20 billion yen
Infrastructure	New technologies (new products, construction methods, and materials) to address newly arising needs for strengthening and improving life of infrastructure	260 billion yen



Advances in DX
Strongly advancing DX as a technology platform in four business fields

TOPICS

Carbon Neutral

Construction of Japan's First Monopile Production Factory

In July 2021, JFE decided to construct a monopile production factory for offshore wind power on the site of JFE Steel's West Japan Works (Fukuyama district) in Kasaoka City, Okayama Prefecture. Construction commenced in June 2022 with the aim of starting operations in April 2024. Of the basic structural components for offshore wind power turbines, the plant will produce monopiles as the support post and transition pieces for connecting to the wind turbine tower. These ultra-thick, long, and super heavy objects have a large diameter, making it difficult to manufacture at existing factories in Japan. When completed, this plant will be the first monopile production factory in Japan.



Completed image

Monopile production factory (as of August 2023)

Core Infrastructure

Completion of Large-scale Road Closure and Renewal Project in Chugoku

In March 2023, a joint venture led by JFE finished a project to renovate a 10.8-kilometer stretch of closed road in Chugoku from the Chugoku Expressway Suita Junction to the Chugoku Ikeda Interchange. This project involved approximately 17,300 tons of steel, and was separated into a total of six segments that took roughly 1.5 months of continuous construction 24 hours a day. The project also entailed construction on one of Japan's largest bridges. There were many constrictive conditions in the large-scale work to renovate the bridge, and to get around these restrictions we deployed a number of new construction methods and technologies. Including the jack-up construction method for new steel girders to replace existing expressways, which was adopted for the first time in Japan, JFE will continue to take on large-scale bridge renovation projects that minimize road closures in urban areas.



Bridge replacement work at night

Waste to Resource

Expansion of Food Recycling Bases

JFE Group company J&T Recycling Corporation has launched full-scale operations at food recycling power generation plants in Sendai City, Miyagi Prefecture in May 2022, and in Komaki City, Aichi Prefecture in May 2023. These operations contribute to local production and local use of energy, as well as the realization of a low-carbon society, by using microorganisms to ferment food waste and use the methane that this fermentation process produces as fuel for power generators. J&T Recycling Corporation has already established these recycling operations in Chiba, Yokohama, and Sapporo, and is constructing plants in Fukuoka, in addition to Sendai and Komaki. We provide technologies that help realize a resource recycling society in regions.



External view of plant at Tohoku Bio Food Recycle Co., Ltd.

Trading Business

JFE Shoji Corporation

Increasing our abilities to offer proposals and convey information, aiming to be a trading company with presence

As the JFE Group's core trading company, we constantly consider the overall optimum sharing strategies with other Group companies to work on strengthening functions. As well, we seek to further increase our abilities to offer proposals and convey information, growing sustainably with our customers to be a company with a strong market presence.

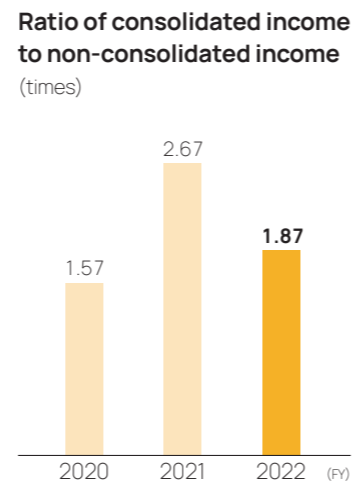
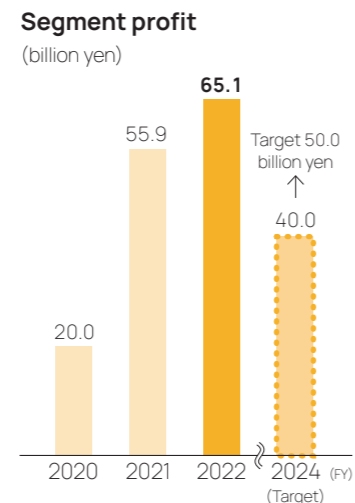
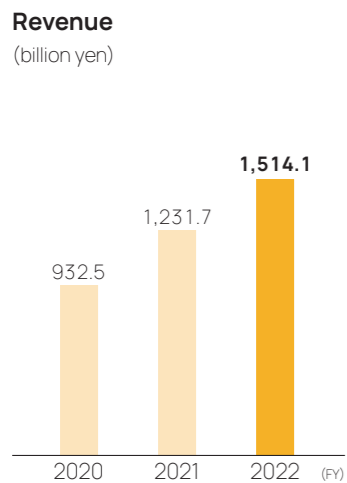
The company contributes to the realization of a sustainable society by providing eco-products via its corporate activities and initiatives for the global recycling of resources.



Toshinori Kobayashi
President and CEO
JFE Shoji Corporation

Strengths	Threats and risks	Opportunities
<ul style="list-style-type: none"> Robust business foundation with steel-related businesses such as steel products, raw materials, and machinery Solid sales, processing, and distribution network in the four global key regions (Japan, the Americas, China, and ASEAN) Maximization of comprehensive Group capabilities through strong collaboration with JFE Steel and JFE Engineering Highly specialized human resources with the ability to propose projects backed by extensive experience in steel-related businesses 	<ul style="list-style-type: none"> Uncertainties in the global economy caused by geopolitical risks, such as Russia's invasion of Ukraine Slowdown in the global economy from monetary tightening to control inflation in Europe and the United States Slower growth in the domestic market and contraction in the manufacturing industry due to declining population Changes in market structure and government policy due to a faster movement toward carbon neutrality 	<ul style="list-style-type: none"> Reviews of customers' supply chains and procurement strategies, in line with changes in the external environment, such as heightened geopolitical risks and post-pandemic recovery Stronger demand for steel in the emerging markets of India and the ASEAN region Higher demand for eco-products that can help reduce CO₂ emissions and conserve energy, in response to growing social expectations in the context of ESG and the SDGs Increasing potential to create new value added and provide services in distribution using DX and AI

Fiscal 2022 results



Key measures in the Seventh Medium-term Business Plan and fiscal 2024 earnings targets

1. Initiatives in priority fields

- Electrical steel: Establish No. 1 position in global processing and distribution
- Strengthen supply chain management of automotive steel composite materials
- Accelerate activities overseas in construction materials business
- Fully capture steel demand in Japan

2. Strengthen purchasing and sales capabilities

- Expand our presence in steel, raw materials, machinery and materials

3. Initiatives for new business opportunities

- Expand environmental-solution businesses
- Promotion of DX

Segment profit

40 billion yen*

(Build a structure able to reliably generate segment profit of 40 billion yen)

* Target 50 billion yen by final year of the medium-term business plan

Initiatives in Fiscal 2022

With restrictions on movement due to the pandemic being lifted, the economy has continued to recover at a moderate pace. Demand for steel products has been firm overall, with consumer spending and capital investment staging a gradual comeback even while concerns mount regarding sharply rising energy and raw material prices due to Russia's invasion of Ukraine, and declining manufacturing activity in some industries due to parts supply shortages. Meanwhile, a sense of crisis has spread for climate change, human rights, and a variety of other ESG issues, and corporations are strongly expected to take part in solutions to these problems.

In this environment, JFE focused efforts on strengthening competitiveness over the medium and long term, carrying on with the previous medium-term business plan's basic policy of "solidifying its footing while moving toward the next stage of growth" in the Seventh Medium-Term Business Plan.

In the steel business, we moved to strengthen supply chains based on a four-pronged global structure. In the electrical steel field, JFE Shoji invested in growth, such as augmenting secondary processing bases at each location in Japan and overseas, further expanding our processing and distribution network in response to the movement toward EVs in the automobile industry, and tapping into growing demand for transformers in tandem with the increasing supply of electricity derived from renewable energy sources. In the overseas steel sheet construction materials field, JFE Shoji acquired a 100% stake in California Expanded Metal Products Co. (CEMCO), the third-largest U.S. manufacturer of steel framing field. In the U.S., investment in building construction is among the largest in the world, and investment is likely to remain brisk as the population grows. JFE Shoji aims to further increase earnings by fully entering this field.

In the raw materials, machinery and materials business, in an effort to address ESG issues, JFE Shoji took steps to expand businesses that help resolve environmental problems, such as expanding the handling of biomass fuel, such as palm kernel shells (PKS) and wooden pallets, expanding suppliers and upgrading yards in order to meet growing demand for scrap in the future, and strengthening sales of blast furnace slag.

In the increasingly important field of DX, we linked a video management system (VMS) to SCADA, a plant monitoring system developed by Group company JFE Shoji Electronics Corporation, to create SDxV®, an integrated system able to manage videos and data together. This system was deployed at JFE Steel's steelworks. The JFE Shoji Group will sharpen its competitiveness by continuing to create and improve corporate value through the provision of groundbreaking services via DX.



Main plant at CEMCO

TOPICS

Environmental Initiatives

Realization of Net Zero CO₂ Emissions in Steel Processing, a First in Japan

Steel processing subsidiary JFE Shoji Coil Center Corporation (JCC) has collaborated with Urban Energy Corporation, a new electric power subsidiary of JFE Engineering, to realize net zero CO₂ emissions in steel processing, a first in Japan, by using on-site PPA (electricity sales contract) provided by JCC to switch to 100% renewable energy sources for electricity used at JCC Shizuoka Works. The JFE Shoji Group will continue efforts to realize a sustainable society, and aims to remain a trading company chosen by its customers and suppliers for its quality, safety, and environmental friendliness.



JFE Shoji Coil Center Corporation Shizuoka Works

Shipbuilding Business

Japan Marine United Corporation (equity-method affiliate)



Challenges and Changes in a New World A company that creates shared value with customers

Japan Marine United provides high-value-added products and services while swiftly responding to the latest changes. Balancing manufacturing with technological development, the basis of its cutting-edge technologies, Japan Marine United is committed to addressing issues in a sustainable society, such as carbon neutrality, safety and security, and digitalization.

Nobuyuki Nada

President and CEO
Japan Marine United Corporation

Strengths

- Ability to build large merchant ships, such as high-performance GHG-reducing ships
- Extensive years of experience and development capabilities in icebreakers
- Renewable energy technologies, including offshore wind power
- Capital and business alliance with Imabari Shipbuilding Co., Ltd.
- Naval ship building and repair structure with four shipyards and five bases

Threats and risks

- Greater volatility in foreign exchange rates and prices for steel and machinery
- Tougher competition due to excess supply of ships from China and South Korea
- Slowdown in the global economy and maritime transportation due to inflation, rising interest rates, and international tensions

Opportunities

- Stronger demand for new ships and replacements to reduce GHG emissions
 - ▶ Stricter regulations for CO₂ emissions from ships
 - ▶ More demand for carbon-neutral chemistry carriers
 - ▶ Expansion in wind farm experiments and projects
- Stronger needs for building and maintaining naval ships as national security strategy is reinforced

Initiatives in Fiscal 2022

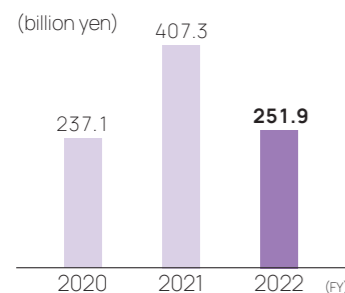
In the merchant ships business, orders have increased as a result of collaboration with Nihon Shipyard Co., Ltd., a sales and design joint venture between Japan Marine United and Imabari Shipbuilding, one of the top two shipbuilders in Japan. On the technology front, Japan Marine United engaged in R&D, such as autonomous ship technologies, and the development of ships powered by alternative fuels such as ammonia. Digital ship navigation services have also been growing. In the naval ships business, Japan Marine United was selected as the primary contractor for a new class of patrol ships that have received high marks. In the offshore and engineering business, progress was made on development of a floating wind power generation project selected by the Green Innovation Fund (NEDO). Moreover, Japan Marine United completed two self-elevating platform (SEP) vessels, which are necessary for the construction of wind farms, and began joint development of installation technologies for large-scale wind turbines on semi-sub floater base ports.

Future Initiatives

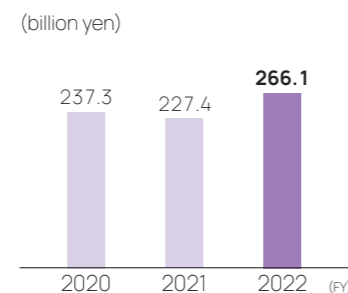
In the core merchant ships and naval ships businesses, Japan Marine United will tap into growing needs for shipbuilding and ship repair, build a sustainably profitable business structure, and advance growth strategies that combine technologies, businesses, and human resources. In addition to past initiatives, we are keen to reduce costs, eliminate bottlenecks in the shipbuilding process, alleviate long-term labor shortages, establish advanced digital designs that leverage AI and robotics technologies, mechanize and automate the shipbuilding process, and improve the capacity of our existing facilities. In technological development, Japan Marine United intends to participate in projects related to the development of practical offshore wind power, early establishment of design and shipbuilding technologies for new carriers of ammonia, hydrogen, and liquified carbon dioxide, with an eye on achieving the SDGs and a carbon-free society from 2030.

Fiscal 2022 results

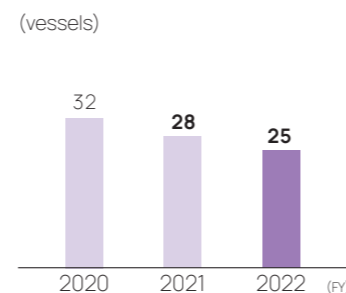
Orders received



Net sales



Vessels built



Annual Highlights

JFE Holdings

Year	Month	Event
2022	Apr.	ENEOS, JERA, and JFE Holdings began joint study of a hydrogen and ammonia supply collaboration based at the Keihin Waterfront Area
	May	Executed a stock exchange agreement for JFE Steel, a wholly owned subsidiary of JFE Holdings, to make JFE Container its wholly owned subsidiary
	Jun.	Decided terms for issuance of transition bonds
	Jul.	Selected for first inclusion in MSCI Japan ESG Select Leaders Index
	Sep.	Published JFE Group Report 2022
	Sep.	JFE 21st Century Foundation decided university research grants and grant research for fiscal 2022
	Sep.	Published JFE Group CSR Report 2022
	Oct.	Launched Ohgishima Town Association for studying land use at Ohgishima area near the Keihin Waterfront Area
	Dec.	JFE Group's corporate commercial aired and special website launched
	2023	Feb.
Feb.		Raised funds through subordinated loans
Feb.		Selected as Environmentally Sustainable Company by Ministry of the Environment's Fourth ESG Financing Awards Japan
Mar.		Sold portion of land at JFE Steel's East Japan Works (Keihin district)
Mar.		Exhibited at WIND EXPO Wind Power Exhibition
Mar.		Introduced climate-change indicators in executive remuneration
Mar.		Selected business partners for north side of north district of Minamimatarida area

JFE Steel (Steel Business)

Year	Month	Event
2022	Apr.	Integrated JFE Mineral, Mizushima Ferroalloy, and JFE Material
	Apr.	Launched high-tensile steel sheets capable of cold forming for use in automobile frames with thyssenkrupp Steel Europe
	Apr.	Fiscal 2022 Science and Technology Award from Ministry of Education, Culture, Sports, Science and Technology (for development of resource-conserving Si gradient steel sheet that helps conserve energy in electrical equipment)
	Apr.	Recognized as 2022 Steel Sustainability Champion by World Steel Association
	May	Fiscal 2021 Japan Society of Civil Engineers Environmental Award (for creating abundant seas with Yokohama City)
	Jun.	Received ISO 45001 certification for occupational health and safety management at production facilities in Kurashiki and Chiba
	Jun.	Full-scale launch of project to use hydrogen in steelmaking process for GI fund project
	Jun.	Decided to build facility for testing prototypes of technology for effectively using CO ₂
	Jul.	Obtained EcoLeaf, the Japan EPD Program by SuMPO for tinplate products
	Aug.	Five construction products including H-beams certified under EcoLeaf
	Sep.	Agreed with Emirates Steel and ITOCHU to study building a supply chain of low-carbon reduced iron
	Sep.	Recognized with 5th EcoPro Award from Minister of Land, Infrastructure, Transport and Tourism (for creating abundant seas in public-private collaboration with Yokohama City)
	Sep.	Held JFE Steel Carbon Neutrality Strategy Briefing
	Sep.	Successfully test produced low-carbon precast concrete using alkaline active materials
	2023	Oct.
Nov.		Fully transitioned to open environment for core systems in Sendai
Nov.		Obtained technical examination certificate for J-dome™ earth retaining steel wall
Nov.		Developed JFE Anti-Seismic Wall, an anti-seismic product for building structures
Dec.		Signed memorandum of understanding on joint study for realization of a carbon-neutral industrial complex in Goi District of Ichihara City and Soga District of Chiba City in Chiba Prefecture
Dec.		California Steel Industries decided to build hot dip continuous galvanizing line
Dec.		Started to demonstrate automated truck transportation system at Keihin site with IHI
Jan.		Obtained J Blue Credit™ certification for seaweed bed creation project with Iwakuni City, Yamaguchi Prefecture using steel slag products
Jan.		Resumed operations of No. 6 blast furnace at Chiba
Jan.		Commissioned JFE Hakuryu, a bi-level roll-on, roll-off ship with automated internal loading and unloading
Feb.		Obtained ISO 45001 certification for all works in Japan
Feb.		Received Chairman's Award in 57th Machinery Awards from Japan Society for the Promotion of Machine Industry (for development of autonomous precision inspection robot)
Mar.		Recognized with Fiscal 2022 Japan Institute of Energy's Award (technical section) (for development of guidance system for fuel and electric power management at steelworks)
Mar.		Developed AFD™ Steel, a thin anti-fatigue steel for steel structures

JFE Engineering (Engineering Business)

Year	Month	Event	
2022	Apr.	Established Aqua Connect Namie Corporation as hydroelectric power generation company	
	May	Launched power generation business at Tohoku Bio Food Recycle Co., Ltd. (J&T Recycling)	
	Jun.	Received order for Intersection multilevel construction (viaduct) from Republic of Ghana	
	Jul.	Established JFE Engineering Collaborative Research Cluster for Carbon Neutrality with Tokyo Institute of Technology	
	Aug.	Full-scale entry into storage battery business: Integrated solutions from project proposal and EPC to optimal operations	
	Sep.	Agreed to implement Integrated multi-site energy network services (JFE-METS) for House Foods Group Inc.	
	Sep.	Participated in plastic waste recycling business in Sendai City (J&T Recycling)	
	Oct.	Launched operations of Dam Optimal Operation System with Hokuriku Electric Power Co., Ltd.	
	2023	Nov.	Received order for Intersection multilevel construction (viaduct) from Republic of Côte d'Ivoire
		Nov.	Received order for construction of high-performance elastomer Tafmer™ plant in Singapore
Dec.		Received order for large-scale sewage treatment facility, the first in the Special Region of Jakarta in Republic of Indonesia	
Jan.		Received order for construction of large-scale LNG receiving facility in Taiwan	
Feb.		DX service package RODAS™ for boiler power plants recognized with Fiscal 2022 Energy Conservation Award in Minister's Prize, the Ministry of Economy, Trade and Industry	

JFE Shoji (Trading Business)

Year	Month	Event
2022	Jul.	Obtained sales rights from Mandal Pipe, a steel pipe sales company in America
	Oct.	Acquired 100% shares in CEMCO, a company that produces and sells Steel Framing and Metal Lath in America
	2023	Jan.
Feb.		Became carbon neutral in steel processing at JFE Shoji Coil Center Corporation Shizuoka Works.

Japan Marine United (Shipbuilding Business)

Year	Month	Event
2022	May	Shiojimar training ship built for Tokyo University of Marine Science and Technology recognized with Ship of the Year 2021 award in fishing and research vessel category
	Aug.	Commenced sea trials related to hybrid mooring of floating offshore wind power facilities off the coast of Akita City and Katagami City in Akita Prefecture
	Oct.	Began the social collaboration course at Maritime and Ocean Digital Engineering (MODE) at the University of Tokyo
2023	Jan.	Delivered BLUE WIND, one of the world's largest self-propelled SEP ships, equipped with a crane with maximum lifting capacity of 2,500 tons
	Feb.	Autonomous Navigation Ship initiative, in which Japan Marine United participates, received Minister of Land, Infrastructure, Transport and Tourism Award at Fifth Japan Open Innovation Prize sponsored by the Cabinet Office

Helping to Resolve Issues Related to Climate Change

Having become an essential part of the sustained development of society and the safe and comfortable lives of people, the JFE Group believes that climate change is a serious management issue that may affect its ability to sustain growth and improve corporate value over the medium to long term. We will advance initiatives while exploring various possibilities, such as taking a multitrack approach to developing technologies for achieving our goal of being carbon neutral by 2050.

JFE Group Environmental Vision for 2050

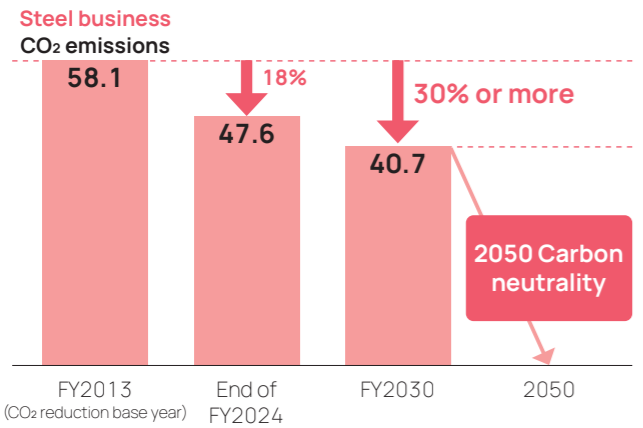
In 2021, the JFE Group formulated the JFE Group Environmental Vision for 2050 with the aim of becoming carbon neutral by 2050, positioning climate change initiatives as one of the most important issues in its Seventh Medium-term Business Plan. In formulating this vision, we will systematically work to resolve climate change problems while reflecting TCFD concepts in our management strategy.

In the steel business, we aim to cut CO₂ emissions by at least 18% by the end of fiscal 2024, compared with the fiscal 2013 level. The JFE Group targets a reduction of more than 30% in CO₂ emissions by fiscal 2030, compared with the fiscal 2013 level. To explore all possibilities for realizing carbon

neutrality by 2050, we will take on the challenge of developing ultra-innovative technologies such as carbon-recycling blast furnaces developed with our unique technology while also adopting a multitrack approach for pursuing other technologies. In our engineering business, we will widen our contribution to the reduction of CO₂ emissions in society as a whole by expanding and advancing renewable power generation and carbon-recycling technologies, by supplying high-performance steel products in the steel business, and through other initiatives. Furthermore, we will accelerate commercialization of our offshore wind power business by applying the strengths of the Group.

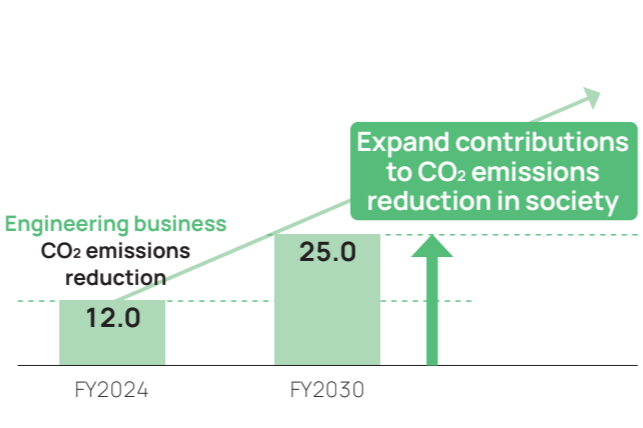
Steel business Carbon neutrality by 2050

(million tons/year)



Engineering business Expand contributions to CO₂ emissions reduction in society

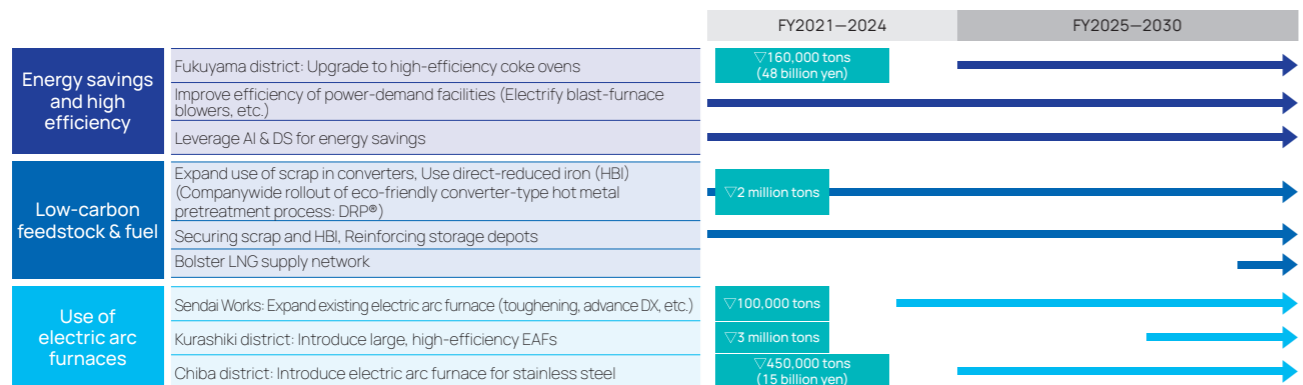
(million tons/year)



Transition to Low-carbon Steel Processing

JFE is advancing multifaceted efforts, including the development of ultra-innovative technologies, toward achieving carbon neutrality by 2050. In the steel business, we have defined

the period up to 2030 as the transition phase, and the period thereafter as the innovation phase. During the transition phase, JFE is working on energy conservation and efficiency



improvements in existing processes, as well as the utilization of electric arc furnace technology. In anticipation of achieving our CO₂ emissions reduction target for fiscal 2030, we see the potential need for investments and loans on the order of 1

trillion yen, and have authorized approximately 110 billion yen as of fiscal 2022. JFE will continue to steadily authorize and execute the necessary investments and loans to achieve these reduction targets.

Development of Ultra-innovative Technologies

During the innovation phase, we will challenge ourselves with the research and development of ultra-innovative technologies such as carbon-recycling blast furnaces and hydrogen steelmaking (direct reduction), aiming to achieve carbon neutrality by 2050.

With the aim of becoming carbon neutral by 2050, JFE Steel has formed a consortium with Nippon Steel Corporation, Kobe Steel, Ltd., and the Japan Research and Development Center for Metals that won a contract from NEDO for its Green

Innovation Fund Project / Project to Use Hydrogen in the Ironmaking Process.

JFE Steel decided to construct facilities at East Japan Works (Chiba district) for conducting experiments related to these projects such as the carbon-recycling blast furnace. The JFE Group is accelerating the development of ultra-innovative technologies with members of the consortium, efficiently advancing development.

Details of plan for experiments

Carbon-recycling blast furnace (150 m ³ capacity)	Plan to start site construction in 2023, launch operations in April 2025, and finish trials by 2026
Direct reduction compact bench pilot furnace	Plan to start site construction in 2023, launch operations in 2024, and finish trials by 2026
Pilot electric arc furnace (10t pilot furnace)	Plan to start site construction in 2023, launch operations in 2024, and finish trials by 2025

Commencement of JGreeX™ Green Steel Supply

In the first half of fiscal 2023, JFE Steel commenced the supply of JGreeX™, a steel product that offers significantly reduced CO₂ emissions compared to conventional products. JGreeX™ has already been adopted by multiple shipping companies (details on page 49). JFE contributes to the reduction of CO₂ emissions related to its customers' use of steel, calculated by applying the mass balance method to find the amount reduced through our CO₂ emissions reduction technologies, and supplying it as steel aggregated into any steel product with third-

party certifications.

As CO₂ emissions reduction across the entire supply chain gains momentum, JFE aims to achieve further reductions in CO₂ emissions through the expanded application of various low-carbon technologies and energy-saving and efficiency-improving technologies. By simultaneously expanding the supply capacity of JGreeX™, we will contribute to the decarbonization of society as a whole.

Summary of JGreeX™ supply

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



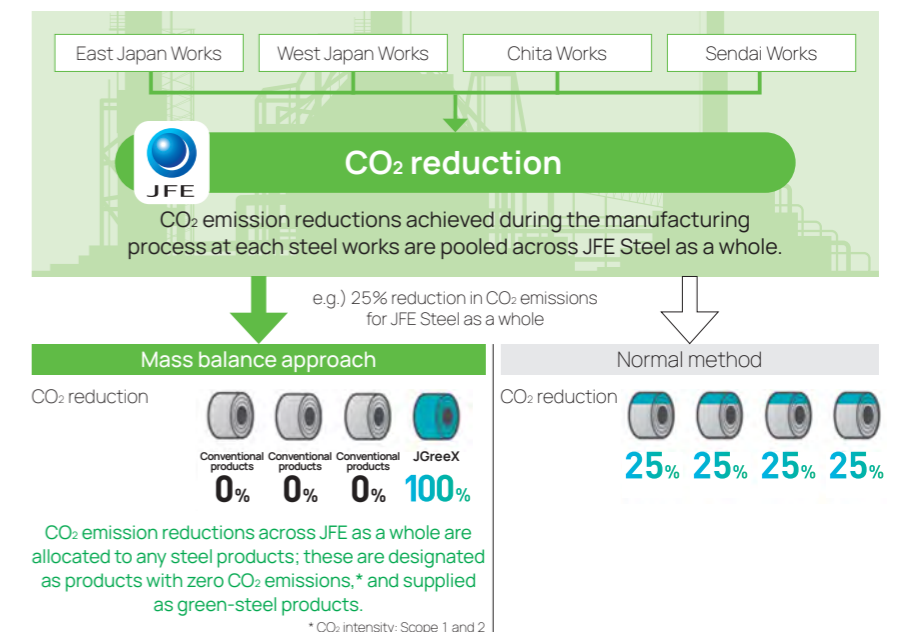
Origins of JGreeX™ name:

JFE + Green + GX
After asking employees in related departments for ideas, we decided on JGreeX™ as the name because it clearly conveys that it is "green steel supplied by JFE Steel."

In the design of the logo

The letter "X," shaped like a pointer to the right, symbolizes the progress being made toward carbon neutrality.

Concept of Green Steel JGreeX™



Helping to Resolve Issues Related to Climate Change

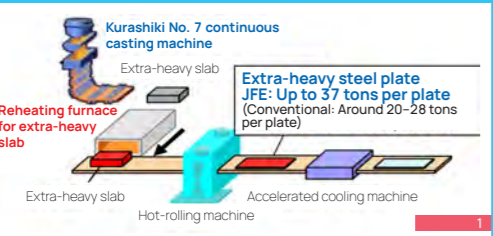


Advancing Commercialization of the Offshore Wind Power Business

Offshore wind power has been introduced mainly in Europe and China, but is forecasted to grow significantly in Asian countries, including Japan. The Japanese government has positioned offshore wind power as one of the pillars of its Green Growth Strategy toward achieving carbon neutrality by 2050. At the JFE Group, we are constructing a manufacturing plant for foundation structures (monopiles) that will support

the country's first offshore wind turbines in Kasaoka City, Okayama Prefecture. The material used to fabricate the monopiles will be extra-heavy steel plates supplied from our steelworks (Kurashiki district). The JFE Group is marshaling all of its strengths to develop new technologies necessary for these monopiles, such as welding technology as well as operational and maintenance technologies for the open seas.

Provide full lineup supply structure for offshore wind power generation

Material production	Manufacture of foundation structure	Installation	O&M (operation and maintenance)
High-quality, extra-heavy steel plate	Bottom-fixed foundation (monopiles, jackets) Floating platform system (semi-submersed)	Work vessels (SEP vessels) Submarine cables unloading pipe installation	Remote monitoring and control technology Offshore support vessels
JFE Steel Manufacture of high-quality, extra-heavy steel plates for the fabrication of foundations (establishment of a mass production system in fiscal 2023)	JFE Engineering Construction of a plant to manufacture monopile foundations, a Japan first (plans to ramp up operations in April 2024) JMU Development and testing of floating platform system (in progress)	JMU Construction of work vessels, including SEP vessels	JFE Engineering Evaluation of commercialization by relying on knowledge of construction and operations for onshore wind farms and various types of plants Group companies Provision of business know-how
1	2	3	
Total JFE Shoji Creation of supply chains with know-how accumulated in steel, raw materials, and equipment businesses			

In the offshore wind power business, the JFE Group's advantages are derived mainly from its steel business, but also the engineering business, trading business, and shipbuilding business, in addition to the diverse businesses of Group companies. The JFE Group is also able to generate synergies

through collaboration among all these businesses. Maximizing the business knowledge of the Group, JFE is moving to commercialize the offshore wind power generation business by providing a full lineup supply structure for the diverse functions required of the offshore wind power generation business.

Information Disclosure Based on the TCFD Recommendations



JFE Holdings declared its agreement with the summary of the final TCFD* recommendation report, released on May 27, 2019.

* The Task Force on Climate-related Financial Disclosures, established by the Financial Stability Board (FSB), based on the opinions of G20 Finance Ministers and Central Bank Governors.

Climate-related risks and opportunities significantly affect the finance of companies in the medium to long term. The TCFD is a task force established by the FSB as requested at G20, to reduce risks that could destabilize the financial market. The TCFD reviews methods of information disclosure that allows the financial market to appropriately evaluate climate-related risks and opportunities, and announces them as final recommendation reports.

The TCFD considers that it is important for investors and other parties to accurately grasp what effects climate-related risks and opportunities pose on the financial conditions of the investee before financial decision-making, based on which the TCFD recommends that information related to four core elements in organizational management—Governance, Strategy, Risk management, and Metrics and targets—should be disclosed.

Governance

The JFE Group's Standards of Conduct states that we will actively work to exist harmoniously with the global environment, as well as to raise living standards and advance societies. We acknowledge that activities to protect the global environment, such as reinforcement of environmental conservation and response to climate change issues, are absolutely essential to achieving a sustainable society.

In fiscal 2016, we designated "mitigating climate change" as our CSR materiality in order to pursue a steady plan-do-check-act (PDCA) cycle and appropriate management of our ongoing initiatives to reduce CO₂ emissions in iron and steel-making processes and to develop and provide environmentally friendly products. In 2021, we added an economic perspective to materiality, prioritized issues based on importance, and

launched new initiatives to address these important management issues.

The JFE Group Environmental Committee, established under the JFE Group Sustainability Council and chaired by the President of JFE Holdings, supervises and directs these initiatives across the Group by setting targets, assessing progress, and holding discussions to improve the Group's overall performance.

The Group Management Strategy Committee also deliberates topics that are vital to our business, such as climate change issues, and reports to the Board of Directors. The Board of Directors provides supervision through discussions on environmental issues such as climate change based on these reports.

Examples of climate change-related issues reported to, deliberated, and decided at Board of Directors' meetings

- Declaration of endorsement of the final TCFD recommendation report
- Information disclosure following the TCFD recommendations (scenario analysis, etc.)
- Formulation of the JFE Group Environmental Vision for 2050 in the Seventh Medium-term Business Plan
- Review reduction targets for CO₂ emissions by fiscal 2030
- Introduce executive compensation linked to climate change indicators

Strategy

The many risks and opportunities involved with climate change issues are integrated into the business strategies of the JFE Group in the following ways. The Group has created the Seventh Medium-term Business Plan to guide business and operations from fiscal 2021 to fiscal 2024. Initiatives to address climate change are positioned as a high priority issue for management within the context of achieving sustained growth over the medium to long term for the Group while increasing corporate value. Moreover, the Company formulated the JFE Group Environmental Vision for 2050 to plot a path toward achieving carbon neutrality by 2050, with ensuring environmental and social sustainability as a key measure. While incorporating initiatives to address climate change in business strategies, the Company is systematically tackling climate change by reflecting the concepts of the TCFD in

business strategies. The JFE Group is disclosing scenario analysis and other information in accordance with the TCFD recommendations, and reflecting in its business strategies its assessments of identified risks and opportunities.

Under the JFE Group Environmental Vision for 2050, the Company engages in corporate activities based on the three strategies of reducing CO₂ emissions in the steel business, making greater contributions to CO₂ emissions reductions in society, and taking initiatives in the offshore wind power generation business. We are taking steps to reduce CO₂ emissions in the steelmaking process and also taking aggressive action to reduce burden on the environment by developing environmentally friendly products and process technologies, and providing solutions for recycling resources.

Risk management

JFE Holdings is responsible for comprehensive risk management in accordance with its Basic Stance for Building an Internal Control System. The JFE Group Sustainability Council, chaired by the President of JFE Holdings, collects Groupwide information and enhances management for the purpose of reducing the frequency and impact of risks. The Corporate Officer responsible for risk works to identify potential risks associated with ESG risks such as climate change. If potential risks are identified, they are reviewed and assessed by the JFE Group Sustainability Council as necessary for further examination or the deployment of countermeasures.

The Board of Directors deliberates, decides, and receives reports on important matters related to ESG risks and sustainability, including climate change issues.

We identify and evaluate climate-related risks at the corporate level, taking into account scenario analysis based on the framework recommended by the TCFD. We select material factors impacting business and perform a closer analysis of their effects, then utilize this in formulating future business strategies, including the Seventh Medium-term Business Plan.

Helping to Resolve Issues Related to Climate Change

Methods of monitoring risks relating to climate change

The JFE Group Sustainability Council, the Group Management Strategy Committee, and the Management Committee monitor risks that may impact our business. Monitoring is conducted through quarterly reports on climate change issues from each operating company deliberated by its environmental committee,

etc., to take suitable measures. The JFE Group Environmental Committee strengthens the collection and management of information relating to risks, to not only reduce the likelihood of risks occurring and their impact but also to strive to maximize opportunities.

Metrics and targets

JFE Steel, the steel operating company of the JFE Group, is a member of the Japan Iron and Steel Federation (JISF). The JFE Group is pursuing the "Three Ecos" and innovative iron and steelmaking process development, which are the main pillars of the Low-Carbon Society Implementation Plan formulated by the JISF. Under this plan, the JISF targeted the reduction of nine million t-CO₂ by fiscal 2030. Phase I of the Low-Carbon Society Implementation Plan finished in 2020, and was renamed to the Carbon Neutral Action Plan. In Phase II, targets have been revised to a 30% reduction in CO₂ emissions from energy sources by fiscal 2030, compared with the fiscal 2013 level. JFE Steel is also actively pursuing action to attain these targets.

sustainability by resolving climate change issues on a global scale. Positioning 2020 as a pivotal year for enhancing its response to climate change, the JFE Group has set targets for reducing CO₂ emissions on the path toward achieving carbon neutrality by 2050, namely a reduction of at least 20% in CO₂ emissions by fiscal 2030, compared with fiscal 2013.

In May 2021, the JFE Group announced new targets for reducing CO₂ emissions, formulating the JFE Group Environmental Vision for 2050, which aims to achieve carbon neutrality by 2050. Initiatives to address climate change are also positioned as an issue of the highest priority in the Seventh Medium-term Business Plan. In February 2022, we raised the fiscal 2030 CO₂ emissions reduction target to 30% or more, compared with fiscal 2013. Moreover, JFE Steel's major domestic group companies set CO₂ emissions reduction targets on a par with JFE Steel. Our business strategies include the initiatives of all Group companies within and outside Japan to tackle climate change. Reflecting the concepts behind the TCFD recommendations in its business strategies, the Company is taking systematic steps to reduce CO₂ emissions.

The JISF, in addition to these initiatives, established and announced its long-term vision for climate change mitigation for 2030 and beyond, which ultimately aims for zero-carbon steel production. JFE Steel also played an instrumental role in the formulation of this long-term vision. Moreover, in 2021 the JISF announced the Basic Policy of the Japan Steel Industry on 2050 Carbon Neutrality, declaring its support for the bold challenge of quickly moving Japan's steel industry to zero-carbon steel.

While restructuring its business in response to changes in the steel business environment, the JFE Group aims to increase

TCFD content index

TCFD Disclosure Recommendations	Summary of TCFD Recommendations	JFE's Disclosure (relevant sections in the SUSTAINABILITY REPORT)
<p>< Governance > Disclose the organization's governance associated with climate-related risks and opportunities</p>	<p>a. Describe the Board of Directors' oversight of climate-related risks and opportunities</p> <p>b. Describe assessment of climate-related risks and opportunities, and management's role in company management</p>	<p>Corporate governance Risk management Climate change (Governance)</p>
<p>< Strategy > Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's business, strategy, and financial planning (if such information is important)</p>	<p>a. Describe the climate-related risks and opportunities over the short, medium, and long term the organization has identified</p> <p>b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning</p> <p>c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C scenario</p>	<p>Seventh Medium-term Business Plan (Major measures) JFE Group's value chain Climate change (JFE Group Environmental Vision for 2050) Climate change (JFE Group's climate change strategy) Scenario analysis based on the TCFD recommendations</p>
<p>< Risk management > Disclose the processes used by the organization to identify, assess, and manage climate-related risks</p>	<p>a. Describe the organization's processes for identifying and assessing climate-related risks</p> <p>b. Describe the organization's processes for managing climate-related risks</p> <p>c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management</p>	<p>Risk management Environmental management Climate change (Risk management)</p>
<p>< Metrics and targets > Disclose the metrics and targets used to assess and manage climate-related risks and opportunities</p>	<p>a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management</p> <p>b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 GHG emissions, and the related risks</p> <p>c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets</p>	<p>Seventh Medium-term Business Plan (Major measures) Important management issues (materiality) Climate change (Metrics and targets) Environmental data</p> <p>Important management issues (materiality) Climate change (JFE Group Environmental Vision for 2050) Climate change (Metrics and targets)</p>

Scenario analysis

While using scenario analysis to correctly understand the risks and opportunities related to climate, we evaluate the effects they have on current business strategies, and utilize them in establishing future strategies. Due to our business having the potential to be significantly affected by climate change, we had used the 2°C and 4°C scenarios, and widened the scope to the 1.5°C scenario in fiscal 2022.

under the assumption that carbon pricing would be introduced into major CO₂ generating countries in order to achieve the 2°C target. Under the 1.5°C scenario we added for reference, we need to accelerate the development and implementation of decarbonization technologies, but there are issues related to development costs, green hydrogen, and green electricity that need to be addressed. The JFE Group is promoting various measures to decarbonize ahead of schedule.

All scenarios are based on the scenarios announced by the International Energy Agency (IEA). The analysis was performed

	Societal Changes and Responses to Changes	Expectations and Concerns of Stakeholders towards the JFE Group	Evaluation Results
<p>1.5°C / 2°C scenario Important factor 1 Decarbonization in steel production processes</p>	<p>Rising societal demands for decarbonization towards steel production processes</p> <p>Implementation of innovative technologies that achieve large-scale decarbonization</p> <p>Implementation of carbon pricing</p>	<ul style="list-style-type: none"> Significant contribution through innovative technologies Increase in investment in the implementation of innovative technologies Increase in operation costs due to the introduction of carbon pricing 	<p>[Opportunities]</p> <ul style="list-style-type: none"> Development and implementation of innovative technologies on top of existing technologies Investment in the implementation of innovative technologies is possible Need to accelerate R&D and implementation under 1.5°C scenario Cost competitiveness is maintained when carbon pricing is implemented worldwide Increase in operational costs (if not introduced in an appropriate manner) <p>[Risks]</p>
<p>1.5°C / 2°C scenario Important factor 2 Increase in demand for the effective use of steel scraps</p>	<p>Increased focus on electric arc furnace method, which emits low levels of carbon</p> <p>Rising expectations toward electric arc furnace steel</p> <p>Increase in scrap generation</p>	<ul style="list-style-type: none"> Replacement of converter steel with electric arc furnace steel Increase in JFE Group's production of electric arc furnace steel 	<p>[Opportunities]</p> <ul style="list-style-type: none"> Restrictions on the amount of scrap provided, increase in production of converter steel Increase in production of electric arc furnace steel and the need for electric arc furnace engineering Expansion of the scrap logistics business
<p>1.5°C / 2°C scenario Important factor 3 Change in demand for steel for automobiles and others</p>	<p>Change in automobile needs</p> <p>Increase of EV motors</p> <p>Decrease of internal combustion engines</p> <p>Reduction of weight and the increased use of multi-materials</p> <p>Rising demands for eco-friendly raw materials</p> <p>Demand for decarbonization and recyclability</p>	<ul style="list-style-type: none"> Increase in demand for electrical steel sheets for EV motors Decrease in demand for special steel due to the decrease of internal combustion engines Replacement of automobile steel due to the increased use of multi-materials Demand for further decarbonization and recyclability in steel production 	<p>[Opportunities]</p> <ul style="list-style-type: none"> Increase in demand for electrical steel sheets due to more electric vehicles Increase in demand for special steel due to increase in automobile sales Increase in demand for high-tensile steel sheets for automobiles Refocus on the recyclability of steel Increase in demand for low-CO₂ steel <p>[Risks]</p> <ul style="list-style-type: none"> Limited impact of the increased use of multi-materials
<p>1.5°C / 2°C scenario Important factor 4 Increase in demand for solutions promoting decarbonization</p>	<p>Shifting to decarbonization</p> <p>Increase in demand for solutions promoting transition toward decarbonization</p> <p>Overseas development of energy conservation technologies</p>	<ul style="list-style-type: none"> Renewable-energy power generation plants Low-carbon business (Eco Solution) in developing countries using Best Available Technology (BAT) developed and commercialized in Japan 	<p>[Opportunities]</p> <ul style="list-style-type: none"> Integrated constructions and operations of renewable energy (biomass, geothermal, and solar power) plants Integrated constructions and operations of waste incinerators and plastic recycling plants Integrated constructions of CCU and CCS facilities Overseas development of low carbon businesses
<p>4°C scenario Important factor 5 Procurement of raw materials becomes unstable due to increased frequency in climate disasters</p>	<p>Intensifying climate disasters alongside rising temperatures</p> <p>Procurement of raw materials becomes unstable</p>	<ul style="list-style-type: none"> Procurement of raw materials becomes unstable 	<p>[Risks]</p> <ul style="list-style-type: none"> Undergoing concrete measures "Alternative procurement methods and source distribution" and "Strengthen capabilities of facilities"
<p>4°C scenario Important factor 6 Damages to business bases due to climate disasters</p>	<p>Intensifying climate disasters alongside rising temperatures</p>	<ul style="list-style-type: none"> Increased damages due to typhoons and rainstorms Increased damages due to water shortages Flood damages due to rising sea levels 	<p>[Risks]</p> <ul style="list-style-type: none"> Flood and water shortage response measures already in motion Flood impacts due to rising sea levels can be coped with the current measures
<p>4°C scenario Important factor 7 National resilience</p>	<p>Intensifying climate disasters alongside rising temperatures</p> <p>Increase in importance of strengthening infrastructure</p> <p>Increased demand for disaster prevention products</p>	<ul style="list-style-type: none"> Contribution with steel and related products that help strengthen infrastructure 	<p>[Opportunities]</p> <ul style="list-style-type: none"> Strengthening infrastructure with steel and related products

Intellectual Property Activities



With its corporate vision of “contributing to society with the world’s most innovative technology,” the JFE Group engages in creative R&D activities. The advanced technologies and products borne from this R&D become vital management resources for the JFE Group, properly protected as intellectual property rights, and strategically deployed in business activities.

JFE Steel’s Intellectual Property Activities

JFE Steel promotes an intellectual property strategy aligned with its business strategies for each business field. In each area of business, the business division, R&D division, and intellectual property division work together to advance intellectual property activities. Especially for vital R&D themes such as green innovation and high-value-added products, there is strong collaboration between the R&D division and the intellectual property division. They prioritize strategic patent filing activities and the monitoring of patents at other companies.

In particular, JFE Steel focuses on solution businesses that offer knowledge, skills, and data cultivated in domestic operations to overseas companies via a platform, thereby accelerating and expanding overseas business. To achieve this, it is essential to acquire patent rights in each country, and JFE Steel is strategically expanding its patent applications abroad. Consequently, the number of its published international patents increased to 386 in fiscal 2022, the highest number among steelmakers worldwide. Furthermore, these activities have led to expansion in international patent licenses.

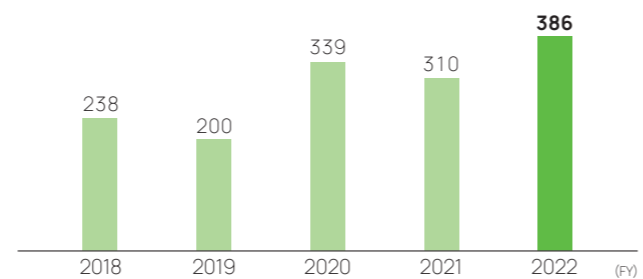
With the aim of encouraging the creation of outstanding inventions, JFE Steel internally established an invention award system in 2018. Every year, the company president presents awards to many inventors. Patents borne from this system have been highly regarded by external parties. For instance, at the Japan Institute of Invention and Innovation’s National Invention Awards event, our patent related to ultra-high

strength thin steel sheets that improve automobile fuel efficiency and collision safety was honored with the Minister of Economy, Trade and Industry Award in 2023. Over the past 10 years, we have received nine National Invention Awards. Additionally, in the Patent Asset Size Ranking 2022 released by Patent Result Co., Ltd., JFE Steel received the top rank in the steel, non-ferrous metals, and metal products category.

In addition to patents, JFE Steel promotes brand strategies to enhance corporate value, such as launching the JGreeX™ brand of green steel and the Steelish® brand for lifestyles that use recyclable steel products.



Number of international patent publications



Major External Awards for Technology and Product Development, etc.

JFE Steel

Award name	Description	Sponsor
Fiscal 2023 National Invention Award Minister of Economy, Trade and Industry Award	Ultra-high-strength thin steel sheet that improves automobile fuel efficiency and collision safety	Japan Institute of Invention and Innovation
57th Machinery Promotion Award, Japan Society for the Promotion of Machine Industry Chairman’s Prize	Development of automated precision inspection robot	Japan Society for the Promotion of Machine Industry
FY2023 The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Awards for Science and Technology (Development Category)	Development of ultra-heavy high-strength steel plate for construction of ultra-large containerships	Ministry of Education, Culture, Sports, Science and Technology



Fiscal 2023 National Invention Award ceremony

Initiatives in Response to International Rule Formation and Standardization

JFE Steel is actively involved in activities related to the formation of international rules and standardization needed for the future of the steel industry, and makes every effort to establish them early on. In this context, JFE identifies technologies that should be shared across the industry, and technologies that

should be used to differentiate JFE Steel. With this in mind, implementing standardization strategies and intellectual property strategies from the R&D stage, we aim to contribute to the steel industry and establish a competitive advantage for JFE Steel both inside and outside the steel industry.

Promotion of DX



In the Seventh Medium-term Business Plan currently underway, we position DX strategy as one of the key strategies that will determine the success or failure of our largest transformation since our founding. We are committed to advancing the DX strategy across the Group to achieve longer-term improvement in corporate value. Additionally, we aim to provide new added value that contributes to the sustainable development of society and for people’s safe and comfortable lives.

JFE Group’s DX Initiatives

Having long been engaged in diverse businesses, we possess vast amounts of world-class operational data, know-how, and technologies, a unique and invaluable asset not found at other companies.

These intangible assets, a wellspring for value creation at the JFE Group, are being combined with cutting-edge technologies, such as AI, IoT, and data science. We are focusing our efforts on innovatively improving productivity, deepening existing businesses, and creating new businesses.

Meanwhile, it is becoming increasingly important to address cyberattacks and the risk of information leaks. It is therefore vital that we strengthen Group security and governance while advancing our DX strategy.

Furthermore, securing and developing the human resources who will be the driving force behind DX is key to the advancement of DX. Across the entire JFE Group and at various levels within the Group, we are progressing with the hiring and training of personnel who are well-versed in each business and capable of advancing DX.

We will proactively advance DX to improve profitability,

achieve growth strategies, and increase the sophistication of our business model.



Source: "DX Stock Selection 2023 Report," Secretariat of DX Survey, Ministry of Economy, Trade and Industry

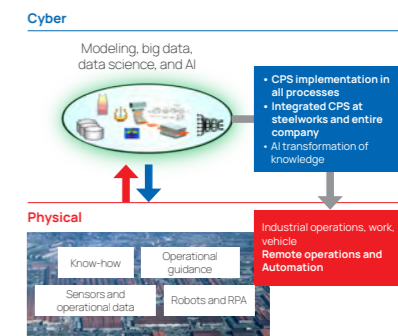
Business Strategies and Initiatives

JFE Steel Strategy: Establish Competitive Advantages through Advanced Data Utilization

Aiming for complete openness in core systems and intelligent steelworks

At JFE Steel, one of the pillars supporting the advancement of DX is structural reforms in IT that integrate and transition aging legacy systems to open platforms. We finished the transition to open core systems at our head office in fiscal 2021 and our Sendai site in fiscal 2022, making steady progress toward completely open systems across the company.

At our steelworks, we aim to realize Intelligent Steel Plants by advancing the CPS conversion of all processes, including blast furnaces, sintering, and hot rolling. Additionally, we are also working on automation and autonomous driving, such as the autonomous operation of trailers.



JFE Engineering Strategy: Sweeping Business Reforms with Further Data Utilization and Provision of Digital Services

RODAS® DX service for boiler power plants

JFE Engineering is committed to creating new services that leverage DX technologies. RODAS® is a DX service that contributes to the optimal (energy-saving) and stable operation of biomass power plants by managing and analyzing plant data, offering remote support, and applying advanced control technologies. This DX service won the Minister of Economy, Trade and Industry Award in the Product and Business Model Category of the Fiscal 2022 Energy Conservation Awards.

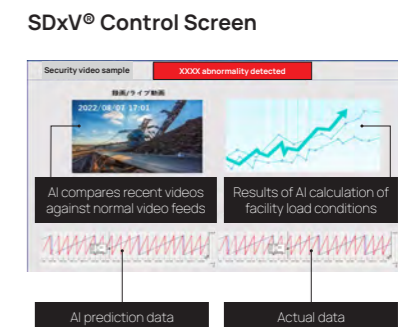
Going forward, JFE Engineering will continue to contribute to the expansion of renewable energy use through the promotion of DX and optimal operation of plants.



JFE Shoji Strategy: Create Businesses through External Sales and Intra-Group Utilization of DX Solutions

Enabling integrated management of steelworks data (temperature, pressure, etc.) and surveillance camera footage

Accurately and promptly understanding and making decisions based on the conditions at production sites can be a significant challenge for operators. JFE Shoji Electronics offers the remote monitoring system SDxV® that enables the consolidated management of plant information and surveillance camera footage. With the implementation of SDxV®, it becomes possible not only to visualize the situation on-site but also to detect anomalies and anticipate maintenance needs through AI-augmented video.



Securing and Training Diverse Talent

In a rapidly changing business environment of increasing complexity, the abilities of each and every employee are a key supporting factor for the JFE Group to continuously enhance corporate value into the future. We have established the JFE Group's Basic Policy on Human Resource Management to guide our efforts to implement measures that bring out the maximum abilities and vitality of employees through investments in human capital.

Basic Policy on Human Resource Management

The Basic Policy on Human Resource Management serves as an overall guideline for the JFE Group in securing and developing diverse talent. Each Group company implements specific measures based on this policy.

JFE Group's Basic Policy on Human Resource Management

(Full text: <https://www.jfe-holdings.co.jp/en/csr/social/diversity/>)

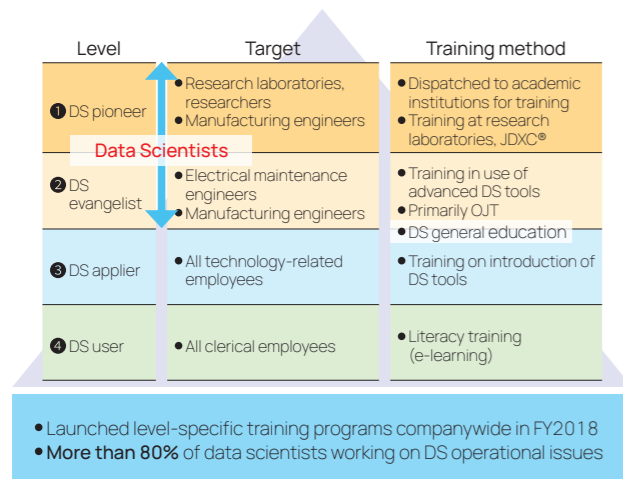
- 1 Respect human rights and facilitate fair management of human resources
- 2 Foster a corporate culture that nurtures people and promotes satisfying workplaces
- 3 Diversify human resources
- 4 Recruit and steadily nurture excellent human resources

DX Human Resource Development

We aim to enhance our training and education systems to improve the abilities of each and every employee, while placing emphasis on the training of global human resources for expanding overseas businesses. In recent years, the JFE Group has been focused on securing and developing the human resources necessary to pursue DX strategy, which is one of its management strategies.

Data science (hereinafter, "DS") technology is being applied in industry at a rapid pace. In order to incorporate DS technology into its business processes, JFE Steel has established a system to independently foster data scientists in-house. Having knowledge unique to the field of the steel industry is essential to applying DS in actual manufacturing and on R&D front lines. With the aim of fostering in-house data scientists and human resources that can harness DS, the Company established a pyramid-shaped rank-based training system according to the required level.

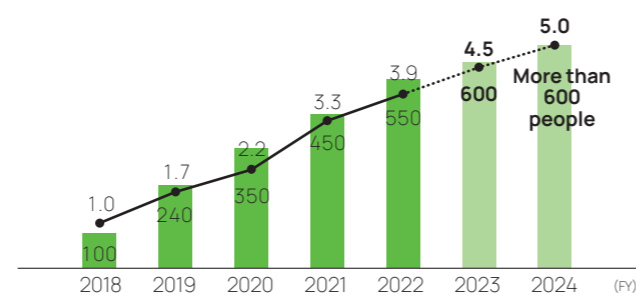
Educational programs by level (JFE Steel)



As of the end of fiscal 2022, we have trained 550 in-house data scientists, increasing by 3.9 times the number of DS-related initiatives compared with fiscal 2018. By pursuing further training, we plan to increase our number of in-house data scientists to 600 by the end of fiscal 2023 and more than 600 by the end of fiscal 2024. Starting in fiscal 2023, we aim to advance these initiatives further by instilling our vision and changing mindsets through training on DX literacy for all employees, in addition to mindset training for executive officers and managers.

At JFE Engineering, we are holding data scientist training courses where employees can gain expert knowledge about data analysis and visualization, as well as machine learning. We aim to have a total of 170 employees take this course by the end of fiscal 2023.

Training of data scientists (JFE Steel)



We have trained about 550 data scientists as of the end of fiscal 2022. We aim to increase this to 600 people by the end of fiscal 2023 and even more by the end of fiscal 2024.



Diversity and Inclusion

Positioning D&I as an important management issue, the JFE Group must be committed to diversity to see it flourish. Working in unison, we are formulating and rolling out Companywide policies that include setting up D&I promotion committees chaired by the presidents of each operating company. We also have an ongoing effort to raise awareness of diversity through training tailored to managers.

The Board of Directors discussed policies and targets related to the empowerment of women, and in fiscal 2022 raised its target for the ratio of female hires and set a target for women qualified as section managers or above to be at least 10% by 2030 (at least 20% in management and sales divisions). At each operating company, management is advancing various measures related to recruitment, retention, and placement and development. In recruitment, for example, JFE Steel missed its target for the ratio of female hires in fiscal 2022, but intends to achieve this target by proactively participating in seminars and augmenting advertising activities so that women can more easily envision a career working at JFE Steel. In terms of retention, we are focusing efforts on hosting networking events for female employees and actively dispatching them to external training programs at Keidanren (Japan Business Federation) and Japan Women's Innovative Network (J-Win), in order to promote networking both inside and outside the Company and create role models for others to follow. Regarding placement and development, we are formulating individual placement and development plans for female employees and carrying out systematic training aimed at management

positions. JFE Engineering has introduced a mentoring program for female managers led by executive officers. JFE Shoji is also conducting training for supervisors and their female employees aimed at cultivating an awareness of career options for women and a career-supporting mindset among managers.

We are also focusing efforts on helping male employees participate in childrearing, and have set as a common target for all operating companies the goal of getting all male employees whose partner has given birth time off for childrearing and also days off as needed for childcare. In addition to disseminating information about in-house systems, we are working to cultivate a culture in which more male employees can take paternity leave, by conveying messages aimed at encouraging men to take paternity leave and sharing examples of employees who have availed themselves of this leave.

Good examples from each operating company are regularly shared among Group companies, and joint initiatives across operating companies are also underway. In fiscal 2022, with the aim of further cultivating a mindset for management roles, we held a roundtable discussion involving JFE Holdings' Director Yoshiko Ando and female managers from both JFE Holdings and other operating companies. Through such efforts, we aim to further promote diversity across the entire JFE Group.



Roundtable discussion

Engagement

We believe that establishing an internal environment where employees find value in their work is essential for diverse talent to fully demonstrate their abilities. Each operating company conducts an engagement survey once a year to regularly grasp employee sentiment. As a key performance indicator (KPI), we have set a target of "over 75% affirmative responses to questions related to job satisfaction," and this KPI helps us identify issues related to job satisfaction and consider measures for improving the work environment. We have implemented various measures, such as instituting an in-house open recruitment system that offers opportunities for new career challenges through voluntary actions, and holding one-on-one meetings to support employee growth. Moving forward, we aim to further improve work motivation through discussions with management and other initiatives.

Creating a comfortable workplace is also a critical element for employees to find their work fulfilling. Therefore, at the JFE Group, we are promoting initiatives for a new way of working aimed at allowing diverse employees to choose flexible working styles based on their individual circumstances. This is to ensure that they find motivation and job satisfaction while helping to improve the Company's productivity. For example, we have expanded remote work systems, introduced coreless

flextime systems, implemented chat and web conferencing tools, advanced RPA, and have moved toward paperless operations. Through these initiatives, we aim for higher-value-added work styles. We are also cultivating a culture that makes it easier to take time off, for instance by setting recommended annual leave days, to enhance work-life balance.

Advertising Activities (Sus-tetsu-nable)

サス鉄ナブル!

Sus-tetsu-nable!*

* A term unique to our Company, it combines steel and sustainability, both of which are essential to society

In 2022, JFE Holdings celebrated its 20th anniversary, and JFE Steel, JFE Engineering, as well as Group companies are similarly marking their 20th anniversaries in 2023. In conjunction with these milestones, we produced corporate commercials aimed at introducing our stakeholders to our efforts toward realizing a sustainable future for the JFE Group. The objective is to get stakeholders to feel more closely connected with us.

We actively engage in these efforts in anticipation that they are broadening awareness through advertising and promotional activities, and will also contribute to enhancing employee engagement and strengthening our hiring capabilities.