

Strategy to Create Value

The JFE Group aims to ensure environmental, social, and economic sustainability through its Seventh Medium-term Business Plan and the JFE Group Environmental Vision for 2050. In this section, we introduce our strategies to create further value by providing solutions for sustainability.

- 35 Message from the CFO
- 37 Progress on Seventh Medium-term Business Plan (Fiscal 2021–2024)
- 39 DX Strategy
- 41 Business Strategies
 - 41 Steel Business
 - 44 Engineering Business
 - 47 Trading Business
 - 49 Shipbuilding Business
- 50 Annual Highlights
- 51 Special Feature: The JFE Group's Challenge (1)
Advancing the Commercialization of the Wind Power Generation Business
Offering a Full Lineup Supply Structure
- 55 Special Feature: The JFE Group's Challenge (2)
Contributions to Resolving Climate Change
—Aiming for carbon neutrality by 2050
- 61 Human Capital
 - 61 Securing and Training Diverse Human Resources
 - 63 Ensuring Occupational Safety and Health



JFE Engineering

Foundation of Life

Our mission is to create the foundation for abundance in life by supporting industry and the lives of people in the fields of energy, the environment, and social infrastructure. For future generations and all the people on this planet, we will continue to provide optimal solutions for society.

Message from the CFO

With an eye on becoming carbon neutral, JFE aims to balance financial soundness with the efficient execution of investments, while bringing in ESG money.

Masashi Terahata

Executive Vice President and CFO
JFE Holdings, Inc.



Review of Fiscal 2021

In fiscal 2021, the global economy largely recovered from the impact of the COVID-19 pandemic, with some disparities in the recovery by country and region. In Japan, production activities in several industries were adversely affected by parts supply shortages, but the recovery trend continued.

Against this backdrop, the JFE Group increased selling prices through efforts to rapidly reflect changes in constantly rising primary raw material costs into product prices, and improved productivity while cutting costs through steady capital investments. As a result, business profit totaled 416.4 billion yen and profit attributable to owners of parent was 288.0 billion yen, for strong year-on-year growth as demand for steel rebounded and steel prices rose.

JFE needs to establish a solid financial position that will allow management to go on the offensive and achieve medium- to long-term growth. As of March 31, 2022, the balance of interest-bearing debt outstanding had increased by 43.3 billion yen compared with a year earlier, to 1,849.4 billion yen, as the increase in primary raw material costs had a major impact on growth in operating capital. Investment outlays of 322.5 billion yen and dividend payments of 40.4 billion yen were covered by net income of 288.0 billion yen

and depreciation of 252.2 billion yen, and the Company reduced assets by 41.0 billion yen. As a result, the financial targets in the Seventh Medium-term Business Plan, the debt/EBITDA ratio was 2.8x and the D/E ratio was 80.8%, both markedly better than a year ago.

Our initiatives to become carbon neutral will require considerable sums of capital for capital investments and R&D for a long time to come. In January 2022, JFE was the first domestic manufacturer to be selected by the Ministry of Economy, Trade and Industry as a model example for the 2021 Climate Transition Finance Model Projects. A third party has certified that JFE is in compliance with various guidelines, and that the Company's carbon-neutral strategy and green/transition bond framework, a part of the governance structure, conforms with the Paris Agreement. With this certification, JFE issued a 30 billion yen transition bond in June. The funds raised from this bond will be used for capital investments, operating capital, and R&D related to initiatives to conserve energy and increase efficiency, manufacture eco-products, develop ultra-innovative steelmaking processes, and expand renewable energy.

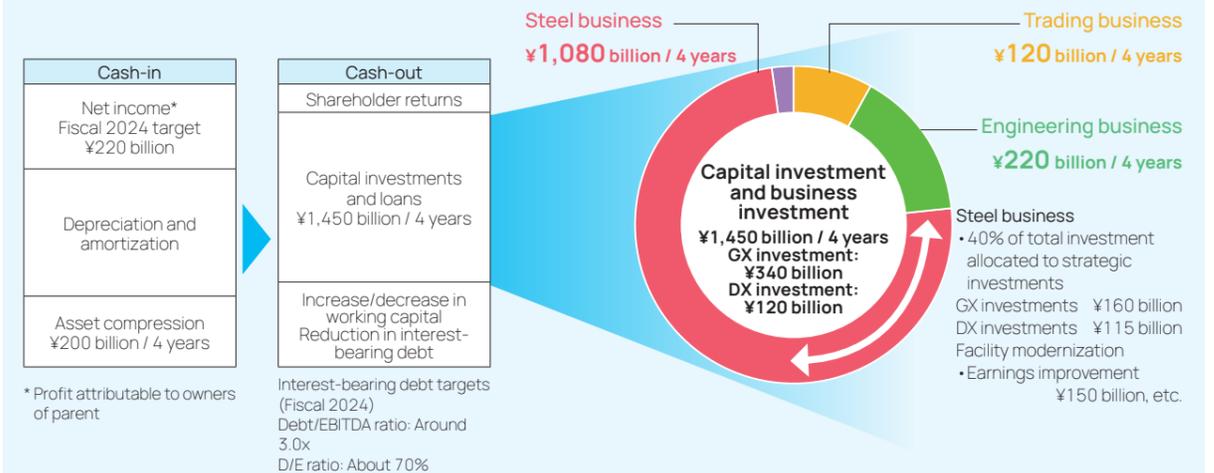
We believe this bond will also lead to the diversification of future fundraising means (i.e., bring in ESG money).

FY2021 Consolidated Cash Flow

Cash-in		Cash-out	
Profit attributable to owners of parent	288.0	Dividend payment	40.4
Depreciation and amortization	252.2	CAPEX & investments	322.5
Asset compression	41.0	Working capital, etc.	261.6
Debt	43.3		

	FY2020	FY2021	Targets in the Seventh Medium-term Business Plan FY2024
Business profit	(12.9)	416.4	320.0
Profit attributable to owners of parent	(21.8)	288.0	220.0
ROE	(1.3)%	15.7%	10%
Debt/EBITDA ratio	8.1x	2.8x	Around 3x
D/E ratio	93.2%	80.8%	About 70%
Interest-bearing debt outstanding	1,806.1	1,849.4	—
Segment profit targets			
Steel business	(65.4)	323.7	230.0
Engineering business	24.0	26.0	35.0
Trading business	20.0	55.9	40.0

Capital Allocation and Investment Plans under the Seventh Medium-term Business Plan



JFE's financial policy under the Seventh Medium-term Business Plan is to make efficient investments based on selection and concentration while maintaining a healthy financial foundation.

By the final year of the business plan (fiscal 2024), JFE targets 220 billion yen in profit attributable to owners of parent. Adding depreciation to this amount, the Company plans to use these financial resources to fund capital investments and loans (decision-making basis: 1,450 billion yen over four years). Furthermore, JFE will ensure that it has a sound financial foundation by reducing cross-shareholdings and reducing assets by reassessing businesses and assets that contribute little to earnings (200 billion yen over four years). Accordingly, JFE intends to improve the debt/EBITDA ratio to around 3x and the D/E ratio to about 70% by fiscal 2024.

Regarding capital investments and loans, JFE has budgeted 1,080 billion yen for the steel business and a combined

340 billion yen for the engineering and trading businesses. In the steel business, JFE will invest 160 billion yen in green transformation (GX) projects, such as expanding electrical steel production capacity and taking steps toward carbon neutrality, and 115 billion yen in digital transformation (DX) projects to conserve electricity and automate. We have set aside 150 billion yen for modernizing facilities and improving earnings, about 40% of strategic investments. The entire JFE Group intends to spend roughly 340 billion yen on GX investments toward becoming carbon neutral, and approximately 120 billion yen for DX investments.

At JFE, management believes one of its highest priorities is to return profits to shareholders. The Company's basic policy is to target a dividend payout ratio of around 30%. Management is keen to actively pay out dividends while also ensuring a sustainable financial foundation for the entire group.

Outlook for Fiscal 2022

So far in fiscal 2022, the business environment has already deteriorated sharply compared with last year, owing to China's zero-COVID policy and an uncertain outlook for the global economy due in part to the prolonged conflict in Ukraine. In the steel business, we anticipate a moderate recovery in demand for steel in the second half of the fiscal year, as economies around the world recover from the pandemic and the Chinese government moves to stimulate the economy, spurring demand for steel in China. For the full year, JFE estimates profit in the steel business will amount to 150 billion yen, a year-on-year decline that owes to an impact from foreign exchange rates with the yen's rapid depreciation, and valuation differences on inventories, despite management's ongoing measures to improve earnings power, centered on hikes in selling prices in Japan. JFE also forecasts profit of 20 billion yen in the engineering business and 55 billion yen in the trading business. For fiscal 2022, JFE aims for consolidated business profit of 235

billion yen and net income of 140 billion yen. In the steel business, management is strongly pushing forward with initiatives to increase selling prices in order to achieve its medium-term targets (profit of 10,000 yen per ton of steel), despite the tough conditions.

Turning to cash flows, management is keen to secure cash by improving the cash conversion cycle (CCC) through reductions in inventories, in addition to thoroughly reducing assets by reassessing businesses and assets that contribute little to earnings. JFE aims to balance its sound financial position with a flexible and precise approach to making the necessary investments in medium- to long-term growth.

JFE plans to distribute an interim dividend of 40 yen per share in fiscal 2022. It has not decided the annual dividend yet (as of August 2022), and will consider a year-end dividend while monitoring trends in earnings.

Progress on Seventh Medium-term Business Plan (Fiscal 2021-2024)



Ensure Environmental and Social Sustainability

Strategies

FY2021 Results

1 Promotion of the JFE Group Environmental Vision for 2050

In May 2021, we formulated the JFE Group Environmental Vision for 2050, positioning initiatives to address climate change problems as the most important management priority. We have taken specific measures to achieve the goals set forth in this vision. We are now taking a multi-pronged approach to developing ultra-innovative technologies to realize carbon neutrality.

- Review of CO₂ emissions reduction target for fiscal 2030 and results in fiscal 2021
 - Changed the previous target of at least 20% to 30% or more (compared with the fiscal 2013 level), and aim to achieve it by expanding the application of existing technologies, amassing new items for emissions reduction, and building a rapid and efficient promotion structure
 - Made steady progress fiscal 2021 toward our medium-term target in fiscal 2024, reducing CO₂ emissions by 9% (compared with the fiscal 2013 level) in the steel business and by 10.56 million t-CO₂ in the engineering business
- Progress on roadmap to becoming carbon neutral (see page 56 for details)
- Built a promotion structure for becoming carbon neutral (see page 57 for details)
- Selected by NEDO's Green Innovation Fund
- Decided to issue transition bonds (first Japanese manufacturer to be chosen by the Ministry of Economy, Trade and Industry as a model example of a Climate Transition Finance Model Project in fiscal 2021)

	FY2021 results	End of FY2024	FY2030	FY2050
CO ₂ emissions reduction (Steel business) (vs. fiscal 2013)	9%	18%	30% or more	Carbon neutrality
Contributions to CO ₂ emissions reduction in society (Engineering business)	10.56 million t-CO ₂	12.00 million t-CO ₂	25.00 million t-CO ₂	-

2 Resolve issues impacting society

Safety/health management

- Prioritize investment in safety measures: 10 billion yen annually Groupwide
- Promote multifaceted occupational safety management (supervision, detection, etc.) using advanced IT

Safety/health management (see pages 63-64 for details)

Focused efforts on ensuring safety by increasing investment in making equipment truly safer with DX and other new technologies, with the aim of having zero serious injuries

- Investing 10 billion yen annually in safety measures Groupwide, in tandem with the medium-term business plan
- Built a framework to prevent injuries involving equipment by using the latest technologies, such as ICT, AI, and data science, in addition to efforts to enhance activities to prevent various injuries

Facilitate employee participation

- Diversity and inclusion: Maximize the abilities of employees with diverse backgrounds
- Personnel training: Improve the skills of each employee and foster global talent
- Work-style reforms: Maintain work environments and internal systems so that employees can work safely and securely while applying their abilities

Facilitate employee participation (see pages 61-62 for details)

Built an environment where diverse employees can utilize their abilities to their utmost and realize our growth strategies while improving competitiveness

- Set a target for at least 10% of management positions filled by women for section head and above by 2030 (at least 20% in management and sales departments)
- Trained 450 data scientists as of the end of fiscal 2021 (aim for 600 by end of fiscal 2024)

Respect human rights throughout the supply chain

Respect human rights throughout the supply chain (see pages 85-86 for details)

In addition to the JFE Group's supply chain, we engage in initiatives to ensure that human rights are respected in all global supply chains. The JFE Group has performed due diligence into human rights since fiscal 2021.

3 Enhance corporate governance

- The JFE Group will examine the use of non-financial indicators related to the environment and society as management targets, and refer to various indicators when making investment decisions and setting director remuneration.
- We will reinforce the Groupwide risk management structure, and appropriately deal with various risks that arise in a changing business environment.
- Further strengthen Group governance

- Introduced indicators for employee safety to determine annual bonuses of executive officers from fiscal 2022
- Plan to introduce indicators related to climate change in the medium-term business plan
- Continued to examine other indicators



Establish Economic Sustainability

Strategies

FY2021 Results

1 Pursue world-class earnings capabilities in transition from quantity to quality in the domestic steel business

Measure	Medium-term Business Plan (FY2024)	FY2021 Results
Cost reductions	¥120 billion	¥30 billion achieved
Ratio of high-value-added products	50%	45% (FY2020: 40%)
Increase selling prices	<ul style="list-style-type: none"> • Quickly reflect cost of main raw materials in selling prices • Started extra improvement activities, revised some prices 	Executed as planned
Finish restructuring	Major cuts in fixed costs, increase labor productivity, improve product mix	<ul style="list-style-type: none"> ● Consolidated equipment as planned ● Started to examine collaboration in hydrogen and ammonia supply businesses based along Keihin coastline
Per-ton profit	10,000 yen/ton	14,000 yen/ton (actually* 6,000 yen/ton)

* Excluding inventory valuation differences, raw material carryover, and foreign exchange translation differences

2 Promote growth strategies

▶ (see pages 41-49 for details)

Steel business

- Examine establishment of a joint company with JSW Steel in India for the production and sales of grain-oriented electrical steel sheet
- Expand solutions business (increase earnings three-fold by fiscal 2024 vs. fiscal 2020)

Steel business

- Deepened business strategy with more local production, including evaluation of business viability for joint establishment of grain-oriented electrical steel sheet production and sales company with JSW Steel in India
- Focused on order activities and won first contract in maintenance technology provision field. Commenced detailed negotiations with customers for first project after commercializing solutions model for providing data science technologies via the cloud

Engineering business

Expand sales revenue to the level of one trillion yen by fiscal 2030

Engineering business

Expanded recycling business bases nationwide and launched plants, constructed a new plant to manufacture bottom-fixed foundation structures (a first in Japan) for offshore wind power generation, and commercialized one of Japan's largest wood biomass power generation plants

Trading business

Create No. 1 global distribution and processing structure for high-performance electrical steel sheet

Trading business

Advanced initiatives to tap into demand in Japan and overseas by investing in an EV motor development company in North America

3 Execution of GX and DX investments, advancement of DX strategy

Investment	Medium-term Business Plan (FY2024)	FY2021 Results
GX investment	¥340.0 billion	<ul style="list-style-type: none"> Investment adoption under 40% Initiatives in offshore wind power generation business • Monopile foundations New plant construction (¥40 billion) • Expansion of production capacity for extra-heavy steel sheet (¥13 billion) Increased production capacity for grain-oriented electrical steel sheet (¥46 billion)
DX investment	¥120.0 billion	<ul style="list-style-type: none"> Investment adoption over 30% Updated systems at steelworks (Kurashiki district)

Progress on DX strategy

- Steel business** Increase productivity and strengthen manufacturing base with cyber physical systems (CPS) / roll out of equipment abnormality detection system with data science technology for hot-rolled steel plants in all districts / developed training simulator using MR technology
- Engineering business** Advanced digital twin initiatives (sophisticated 3D designs and visualization of plants) / developed AI smoke detection system
- Security measures** Took steps to counter increasingly advanced and sophisticated cyberattacks and risk of information leaks / created cybersecurity department in steel business

4 Balance financial soundness with effective investment based on a "select and concentrate" approach

Consolidated	FY2024 Plan	FY2021 Results	Operating companies	FY2024 Plan	FY2021 Results
Business profit	¥320.0 billion	¥416.4 billion	Steel business		
Profit attributable to owners of the parent	¥220.0 billion	¥288.0 billion	Profit per ton*2	10,000 yen/ton	14,000 yen/ton*3
ROE	10%	15.7%	Segment profit	¥230.0 billion	¥323.7 billion
Debt/EBITDA	About 3x	2.8x	Engineering business		
D/E ratio*1	About 70%	80.8%	Segment profit	¥35.0 billion	¥26.0 billion
Payout ratio (DPS)	About 30%	28% (¥140)	Revenue	¥650.0 billion	¥508.2 billion
			Trading business		
			Segment profit	¥40.0 billion	¥55.9 billion

*1 For liabilities with equity subject to credit ratings, these equities reflect the evaluations of rating agencies
 *2 Steel business profit per ton (consolidated segment profit / non-consolidated sales volume)
 *3 Actually 6,000 yen/ton

DX Strategy



DX Strategy as Key to Transformation

Challenging the Next Step: Transformation of Existing Businesses, Creation of New Businesses, and Innovation of Groundbreaking Improvements in Productivity

Our DX strategy in the Seventh Medium-Term Business Plan (hereinafter "the current business plan") is one of the most important strategies that will determine the outcome of our largest transformation since our founding. The data, knowhow and technologies that the Group has accumulated over the years are a source of value creation, precious assets that cannot be imitated by other companies. By combining these DX initiatives, we aim to further improve

productivity by increasing production efficiency and strengthening competitiveness, and also **focus efforts on the transformation of existing businesses and the creation of new businesses.**

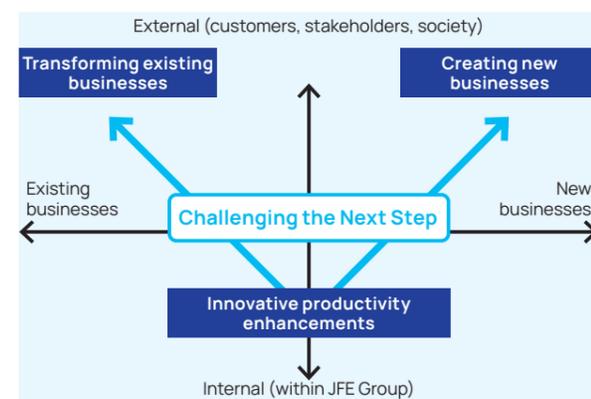
Meanwhile, it is becoming increasingly important to address cyberattacks and the risk of information leaks. It is therefore vital that we strengthen security and governance while advancing our DX strategy.

Groupwide

- Aggressive DX to lead to improve earnings power, realize growth strategy and advance business model
- DX investments: ¥120 billion over four years
→ Fiscal 2021 results
Over 30% of investments selected

Strategy for Each Business

JFE Steel	Establish competitive advantage through advanced use of data
JFE Engineering	Provide digital services and execute business process re-engineering by using data better
JFE Shoji	Sell DX solutions externally and create businesses by using DX solutions internally



Source: "Digital Transformation Stock Selection (DX Stock) 2020," Secretariat of DX Survey, Ministry of Economy, Trade and Industry

DX Initiatives in Each Business

JFE Group companies are advancing DX strategies. Here, we introduce some leading DX initiatives in each business.

JFE Steel Initiative to Implement CPS in All Processes during the Seventh Medium-term Business Plan

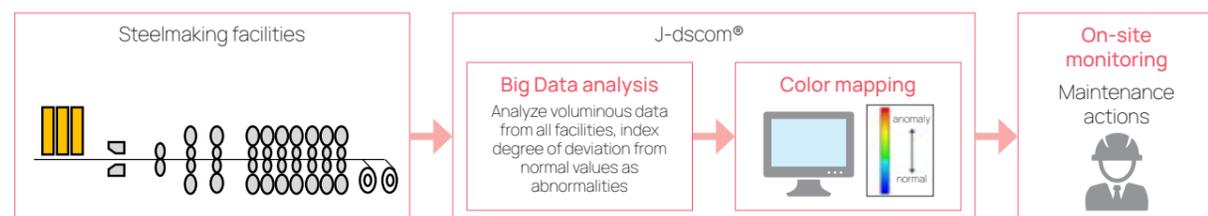
Rollout of System for Detecting Signs of Equipment Anomalies Based on Data Science Technology to All Hot Strip Mills

JFE Steel aims to **create Intelligent Steelworks with an optimal level of autonomy** and implement Cyber Physical Systems (CPS) that encompass steelworks. By the end of the Seventh Medium-Term Business Plan, JFE Steel targets an annual boost of ¥30.0 billion to earnings and at least 20% to labor productivity as a result of remote and automated operations of plants, work and vehicles. We will improve equipment productivity, stabilize operations, and increase quality assurance and control.

As a part of these efforts, JFE Steel is rolling out the J-dscom® system for detecting signs of equipment anomalies at steelworks for its Hot Strip Mills in all districts. Using Big Data analysis technology, this system efficiently and comprehensively analyzes voluminous

data on the state of operations. The system maps out the size of changes in abnormalities over time, and quickly identifies the equipment and parts where the abnormality is occurring, thereby facilitating appropriate maintenance actions.

At the Hot Strip Mills at West Japan Works (Kurashiki district), where this system was first introduced in fiscal 2018, we have verified that the system has reduced problems equivalent to more than 50 hours per year (equivalent to more than 30,000 tons of output). JFE Steel aims to improve **productivity further by preventing equipment troubles beforehand** through the rollout of the system to other manufacturing processes.



JFE Steel Enhancing an Information System Platform for DX Promotion

Transition of all Head Office Mission-critical Systems to an Open Platform Completed

In fiscal 2021, our company completed the transition of all head office mission-critical systems, including the J-Smile® system for sales and orders, to an open platform. This is **the first case in Japan of a complete migration of a large-scale mission-critical system** over 40 million STEP to an open platform. The head office has accumulated a vast amount of data assets, including data on orders and deliveries of steel products, as well as information on the manufacturing history and

quality of individual steel products. Based on a flexible IT platform, we will be able to further **accelerate business reforms using data assets**, such as increasing the efficiency of the entire supply chain through comprehensive analysis of these big data. By making the most of the knowledge gained from this project, we will continue to reform the system at each steelworks in order to complete the transition of the systems at all sites in our company to an open platform.

JFE Steel News Release
Transition of all Head Office Mission-critical Systems to Open Platform Completed: Restructuring IT Platforms to Promote DX
<https://www.jfe-steel.co.jp/release/2022/03/220315.html>
(in Japanese only)

JFE Engineering Opening of 5G Innovation Plant with High-speed Wireless Communications Environment

Start of Verification of Cutting-Edge Technologies, Accelerating Plant DX

In the construction, operation and maintenance of plants, handing down expertise to the next generation and maintaining stable and safe operations has become an issue amid a decline in veteran workers. To solve these issues, JFE Engineering is building remote control systems and automated operation systems. In order to make further advancements on this front, high-speed wireless communications will play a key role because new technologies such as drones need reliable high-speed communications. In March 2022, JFE Engineering opened **the 5G Innovation Plant at the Yokohama Head Office**

as an experimental plant with the latest 5G communications technologies. This facility can be used to demonstrate and promote developed products, and allows venture firms to conduct experiments with technologies related to automation and labor-saving measures for plants. Leveraging our accumulated system building technologies and operational know-how in various kinds of plants, we are keen to accelerate the development of solutions for the remote control, automation and labor-saving measures for plants. We are **developing businesses to provide new one-stop digital services.**

Example solutions



Remote assistance using smart eyeglasses



Safety monitoring with AI-implemented equipment (helmet)

JFE Shoji Non-destructive Inspection with Radar-equipped Drones

Enables Visualization of Risks Unseen with Naked Eye, Enhances Safety of Inspection Work

In recent years, the drone inspection market has grown, mainly for inspecting equipment that is hard for people to inspect, such as aging infrastructure and equipment in high places. With Osaka University, JFE Shoji Electronics is advancing R&D in radar systems that can be installed on drones. Radar waves can be used in phase detection by alternating frequency bands adapted to various objects being inspected, enabling the diagnosis of conditions in the object in a contact-less and non-destructive manner. **shedding light on risks that cannot be seen by the naked eye.** Drones can be used to inspect and maintain equipment in high places

inside plants, as well as in a wide range of fields, including construction and infrastructure. We expect drones to help improve efficiency and safety, while helping to solve issues related to worker shortages and the cost of inspections and maintenance. There are some forecasts that the market for inspections with drones will expand from 28 billion yen in 2020 to 170 billion yen in 2025. We will accelerate the development of smaller drones with better accuracy to further commercialize this technology, with the aim of **creating a business for externally selling this solution and using it at Group companies.**



Radar-equipped drones (compatible with 1GHz-1,000GHz frequencies and bands) enable remote inspections of inside objects by exposing its properties





Transformation toward carbon neutrality while shifting from quantity to quality

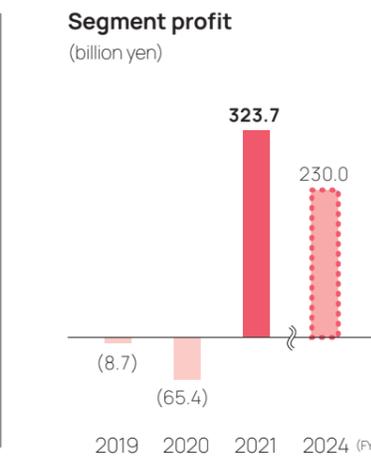
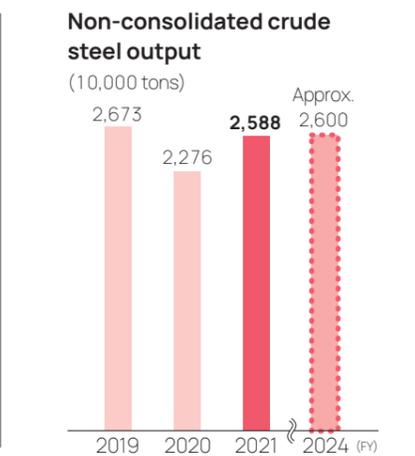
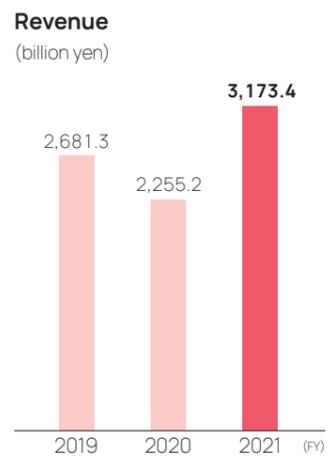
JFE Steel is accelerating the development of technologies for becoming carbon neutral and adapting to structural changes in the business environment. The company is establishing a solid yet lean business structure while shifting from quantity to quality. In order to remain essential to society, JFE Steel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



Yoshihisa Kitano
President and CEO
JFE Steel Corporation

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 World-leading R&D capabilities Abundant technologies and operational/research know-how Strong alliances forged with steelmakers around the world Cutting-edge AI, IoT, and data science technologies to evolve the company through digital transformation Extensive customer base built up over the decades 	<ul style="list-style-type: none"> Increasing demands for worldwide reduction of CO₂ emissions Tougher global competition from new rivals in China 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 U.S.-China trade friction Impact on the global economy from Russia's invasion of Ukraine High commodity prices, including for key raw materials Sharp swings in foreign exchange rates Another wave of COVID-19 infections 	<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 of ships Demand for operational and environmental support technologies from steelmakers in emerging countries Increasing demand for steel materials due to medium- and long-term growth in emerging countries Increasing demand for infrastructure for natural disaster prevention and replacement to make Japan more resilient Top global runner in zero-carbon manufacturing processes

Fiscal 2021 results



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*
10,000 yen/ton
(Target segment profit of 230.0 billion yen)
* Segment profit / unconsolidated sales volume in tons

Initiatives in Fiscal 2021

In fiscal 2021, segment profit totaled 323.7 billion yen, a year-on-year improvement of 389.1 billion yen. Profit was 14,000 yen per ton of steel, higher than our fiscal 2024 target of 10,000 yen per ton. Excluding inventory valuation differences and other factors, however underlying profit was 6,000 yen per ton. JFE Steel will continue activities to improve earnings, such as increasing selling prices and reducing costs. In fiscal 2021, the business environment saw major fluctuations in demand with automakers cutting production volume due to shortages of semiconductors and other parts in the second half, while the global economy recovered from the impact of the COVID-19 pandemic. Costs increased as prices rose for primary raw materials, such as metals, and scrap prices and freight rates also rose. In response, the company increased selling prices to rapidly reflect the rise in primary raw material costs and shored up the

earnings foundation further by reducing other costs by 30 billion yen annually. Furthermore, earnings expanded at Group companies within and outside Japan, resulting in higher profits overall. Regarding capital investments, the company steadily implemented major measures that included starting operations of the No. 7 continuous casting machine and renovating the No. 4 blast furnace in the Kurashiki district.



No. 7 continuous casting machine in the Kurashiki district

Medium- to Long-term Strategy and Future Initiatives

In fiscal 2022, the business environment remained challenging in the first half of the year, as domestic automakers continued to restrict production volumes due to semiconductor and other parts shortages, and overseas market conditions remained weak. As the end of the fiscal year approaches, JFE Steel expects supply-demand conditions to tighten again as the automobile industry gradually recovers and business activities in other sectors stay strong while the economy stages a comeback. Global demand for steel is also likely to bounce back. On the other hand, the impact on the global economy from a prolonged Russia-Ukraine war is a major concern. Volatility in prices for key raw materials and rising commodity prices in particular have had a major impact. It is unknown how demand will be affected by turmoil in global supply chains caused by the sharp weakening of the yen and a resurgence in COVID-19 cases. In addition to efforts to rapidly reflect in selling prices the increase in costs for key raw materials, which gained traction in fiscal 2021, JFE Steel is stepping up efforts at reflecting in selling prices the increase in other commodity prices, adding extra surcharges, and working to move prices to sustainable levels.

In 2023, the company will commence construction on various prototype furnaces, including a carbon-recycling blast furnace, a direct reduction furnace, and an electric arc furnace, that will be facilities for testing the use of hydrogen in the steelmaking process, a project that has been designated by the New Energy and Industrial Technology Development Organization (NEDO) as a Green Innovation Fund project. We will continue to advance R&D into ultra-innovative technologies like these.

Regarding initiatives to become carbon neutral, JFE Steel aims to reduce CO₂ emissions by 30% or more by fiscal 2030, compared with the fiscal 2013 level, and is making steady progress on the development and expanded application of low-carbon technologies. For example, JFE Steel has cut CO₂ emissions by introducing at all of its steelworks districts the eco-friendly Double-slag Refining Process (DRP®), a converter-type, molten-iron pretreatment process that makes existing steelmaking processes more environmentally friendly by allowing extra scrap to be used in converters. We are keen to establish a supply structure for green steel by continuing to slash CO₂ emissions.

In our initiative to transition from quantity to quality, we are steadily implementing structural reforms through selective concentration in a bid to sharpen competitiveness, including the halting of operations at facilities in the Chiba district in fiscal 2022 in order to consolidate operations in steel for cans in the Fukuyama district and the halting of upstream processes and hot-rolled steel facilities in the Keihin district in fiscal 2023. As a result of these moves, management anticipates benefits from a major reduction in fixed costs. While continuing to significantly revise selling prices, the company will improve the product mix. JFE Steel made good progress toward its target for a high-value-added product sales ratio of 45% in fiscal 2021, up from 40% in fiscal 2020 (aiming for 50% in fiscal 2024). With the objective of increasing management efficiency, management decided to integrate JFE Mineral Company, Ltd., JFE Material Co., Ltd., and Mizushima Ferroalloy Co., Ltd. and turn JFE Container Co., Ltd. into a wholly owned subsidiary in fiscal 2022.

In order to become carbon neutral by 2050, JFE Steel is taking a multifaceted approach to developing ultra-innovative technologies, such as carbon-recycling blast furnaces, a proprietary technology.

Moreover, the company has been steadily implementing DX initiatives to reinforce the manufacturing base. The company decided to update systems at steelworks in the Kurashiki district, detect signs of equipment anomalies at hot-rolled steel sheet plants in all districts, and restructure IT platforms, including the transformation of all head office mission-critical systems to an open platform. The company aims to expand the solutions business that offers its advanced manufacturing technologies and research know-how.

Progress on restructuring and major capital investment plans

Facilities	FY2021	FY2022	FY2023	FY2024-
Blast furnace (BF) revamp	Kurashiki Revamp No. 4 BF (-Dec. 2021)	Chiba Revamp No. 6 BF (Sep. 2022-Jan. 2023)		
Shutdown of tin mills in Chiba		To be shut down (-Sep. 2022) (No. 2 Tandem Mill, No. 4 CAL, TFL)		
Shut down of upstream facilities in Keihin			To be shut down (-Sep. 2023)	
Shutdown of hot rolling facilities in Keihin			To be shut down (-Sep. 2023)	
CAPEX related to improvements of high-value-added product ratio	Kurashiki No. 7 continuous casting machine operations (Jun. 2021-)		At Kurashiki, reinforce extra-heavy steel plate production line for offshore wind power application (Nov. 2023)	At Kurashiki, reinforce non-oriented electrical steel sheet production line (2024-)

TOPICS

Progress on Our Transformation

Initiatives to Realize Carbon Neutrality by 2050

JFE Steel is taking multiple approaches to becoming carbon neutral by 2050, including the development of ultra-innovative technologies. The company has set a target for reducing CO₂ emissions by 18% as of the end of fiscal 2024 and by 30% or more by fiscal 2030, compared with the fiscal 2013 level. The company has defined the period to 2030 as a transition period and the period after 2030 as an innovation period. During the transition period, JFE Steel intends to steadily move toward its targets for reducing CO₂ emissions by fiscal 2030 through the broader application of low-carbon technologies with a focus on ways to reduce emissions. In preparation for the switchover

to the innovation period, the company will accelerate R&D in ultra-innovative technologies. During the innovation period, JFE Steel will focus on cleverly deploying carbon-recycling blast furnaces that feature its proprietary carbon-recycling technologies, quickly implementing the direct-reduction steelmaking method, and expanding the application of CCU technology. Moreover, the company intends to fixate CO₂ through CCS with an eye on building a carbon-neutral society in collaboration with local communities and conglomerates. JFE Steel aims to become carbon neutral through these initiatives.

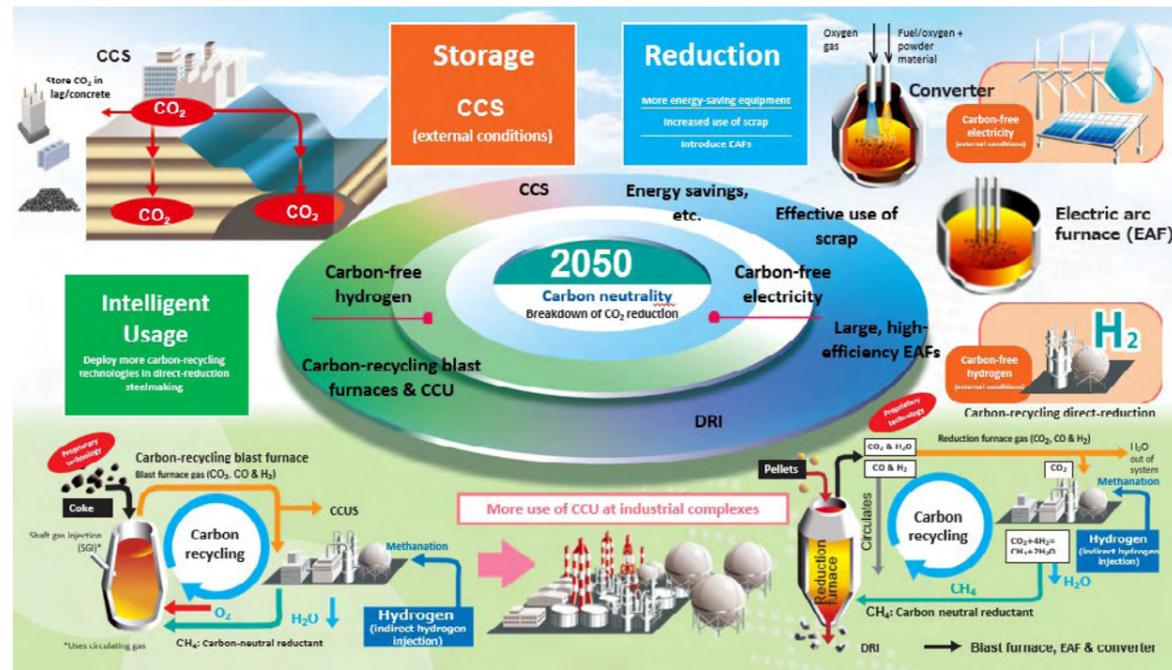
Low-carbon technologies for reducing CO₂ emissions by 30% or more by fiscal 2030

Energy savings and high efficiency	<ul style="list-style-type: none"> Upgrade to high-efficiency coke ovens <Fukuyama district (2025)> Improve efficiency of power-demand facilities (Electrify blast-furnace blowers, raise efficiency of oxygen plants, etc.) <All districts (under way)> Leverage AI & DS (companywide CPS, etc.) for energy savings <All districts (under way)>
Low-carbon feed-stock & fuel	<ul style="list-style-type: none"> Expand use of scrap in converter furnaces, use reduced iron (HBI) <All districts (under way)> Securing Scrap and HBI, reinforcing storage depots <All districts (under way)> Bolster LNG supply network
Low-carbon processes	<ul style="list-style-type: none"> Upgrade existing EAFs <Sendai Works (2024)> Introduce large, high-efficiency EAFs <Kurashiki district (2027-2030)> Commercialize ferro coke (1,200-ton-per-day plant) <Fukuyama district>

Develop ultra-innovative technologies

<ul style="list-style-type: none"> Prototype carbon-recycling blast furnace <Chiba district, operational in 2025> Direct-reduction compact bench prototype furnace <Chiba district, operational in 2024> Prototype electric arc furnace to develop impurity removal technologies with direct reduction iron <Chiba district, operational in 2024>
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See page 56 for our roadmap to becoming carbon neutral by 2050.
See page 57 for information about our approach to becoming carbon neutral.



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.

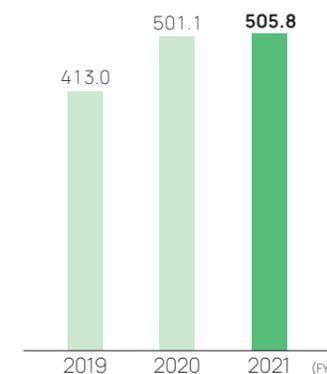


Hajime Oshita
President and CEO
JFE Engineering Corporation

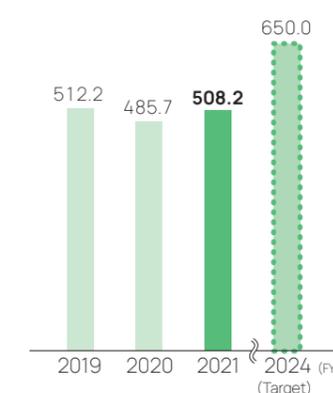
Strengths	Threats and risks	Opportunities
<ul style="list-style-type: none"> Track record and technological capabilities in the broader infrastructure business Track record and technological prowess in the environmental, recycling, and renewable energy fields Stable earnings foundation thanks to expansion in the operation & maintenance 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 Loss of business opportunities due to COVID-19 and uncertainty in the global economy from 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 2021 results

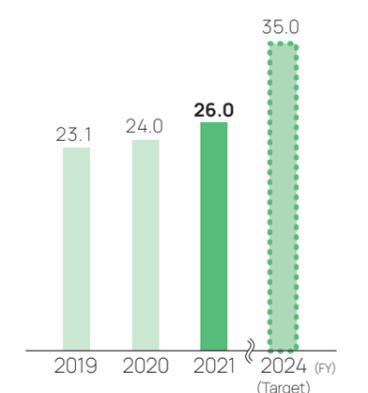
Orders received (billion yen)



Revenue (billion yen)



Segment profit (billion yen)



Development of Recycled Steel Cups

As a newly developed application for steel sheet for cans, JFE Steel has been promoting a recycled steel cup for beverages project since October 2021 with the aim of reducing plastic waste. This project is an attempt to propose a new lifestyle through the development of new products, with steelmakers on the "production side" collaborating with consumers on the "user side" to tackle the problem of single-use plastic cups. We intend to roll out various initiatives for using steel cups as a way to eliminate single-use container waste that is generated in large volumes at events. Using the excellent 94% recyclability of steel cans, we will contribute to the attainment of the SDGs while sustaining growth.



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 2021

JFE Engineering expanded the operation & maintenance 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, JFE Engineering received orders for major projects, mainly in its fields of expertise: waste-to-energy power plants, pipelines, bridges, and other public works projects, marking steady progress in the "creation" business of the foundation of life.

In operation & maintenance businesses, JFE Engineering participates in biomass power generation private finance initiative (PFI) projects and concessions in the water field. In April 2022, operations commenced at a new gas and waterworks project that the company comprehensively manages, a first in Japan. In the electric power field, we expanded our bases in areas where energy is produced for local consumption through regional new electric power companies with connections to local governments. J&T

Recycling Corporation, which is in charge of the recycling business, has focused on expanding its food recycling bases while managing projects to recycle PET bottles, demand for which has been growing each year. By expanding our operation & maintenance businesses, we aim to establish a corporate structure with earnings that are less susceptible to fluctuations in orders for projects.

In overseas operations, we are aggressively advancing efforts to set up operation & maintenance businesses with local partners and carry out EPC projects with a focus on Europe and Southeast Asia. We participated in an industrial waste processing project in Malaysia, and a large-scale waste-to-energy power generation project in Vietnam.

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 the previous fiscal year.

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 operation & maintenance 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 works for 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 operation & maintenance 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

Waste to Resources

Commencement of Commercial Operations at West Japan PET Bottle MR Center

Kyoei J&T Recycling Corporation was established in April 2020 as a joint venture of Kyoei Industry Co., Ltd. and J&T Recycling Corporation, a Group company of JFE Engineering. After partial operations were started up in October 2021, the West Japan PET Bottle MR Center, a PET bottle recycling and material production plant that was constructed by Kyoei J&T Recycling Corporation, began full-scale commercial operations in April 2022. This plant features the first bottle-to-bottle integrated production system in the Chubu and Tokai regions with sufficient production capacity to cover demand across these regions. This puts into place a structure for reliably supplying recycled materials.



Carbon Neutral

Decision to Commercialize One of Japan's Largest Woody Biomass Combustion Power Plants

In October 2021, JFE Engineering decided to commercialize one of Japan's largest woody biomass combustion power plants with a rated output of 112,000 kW in Tahara City, Aichi Prefecture. In December 2021, JFE Engineering received an EPC order for this plant. Backed by investors JFE Engineering, Chubu Electric Power Co., Inc., Toho Gas Co., Ltd., and Tokyo Century Corporation, Tahara Biomass Power LLC is in charge of commercializing the power plant, and plans to commence operations in September 2025. The company contributes to the realization of a carbon-neutral and sustainable society through renewable energy power generation projects.



DX

Opening of 5G Innovation Plant

In March 2022, as part of DX initiatives, JFE Engineering opened the 5G Innovation Plant at its Yokohama Head Office. It is featuring actual plant facilities and next-generation high-speed wireless communications in order to facilitate real-world testing. Venture firms, companies, research groups, and others can bring their cutting-edge technologies and business ideas to the 5G Innovation Plant to test out their innovations. In this way, we contribute to the creation of new value, products, and services for the future of workplace automation and labor-saving technologies in plant construction, operation, and maintenance.





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.

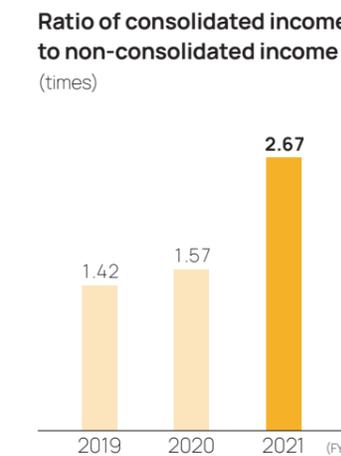
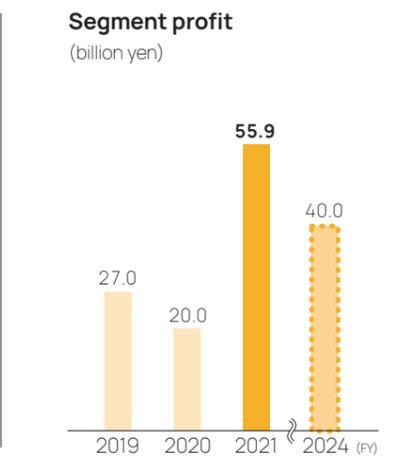
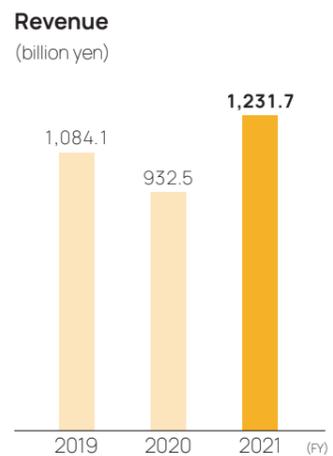
The company contributes to the realization of a sustainable society by providing eco-products via its corporate activities and initiatives for the global recycling of resources.



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 tensions between the United States and China Negative impact on corporate activities and supply chains from restrictions on economic activities caused by the COVID-19 pandemic 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"> Revision of customers' supply chains and procurement strategies, in line with changes in the external environment, such as U.S.-China trade friction and the impact of COVID-19 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 2021 results



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

- 1. Initiatives in priority field**
 - 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 the 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)

Initiatives in Fiscal 2021

Global demand for steel, having weakened during the COVID-19 pandemic, returned in fiscal 2021. Amid tight supply-demand conditions for steel, prices for steel increased and have remained at high levels, owing to rising raw material costs. Serious supply chain problems caused by shortages of semiconductors and other parts have been a drag on the pace of recovery in demand, but overall demand is rebounding from its bottom during the pandemic.

In this environment, under its Seventh Medium-term Business Plan that began in fiscal 2021, JFE Shoji worked to strengthen its supply chain in its four-pronged global structure, based on the basic policy of "solidifying its footing while moving toward the next stage of growth" in its previous medium-term business plan.

In the steel business, earnings expanded considerably owing to higher prices and stronger demand for steel, in addition to measures implemented to reinforce the earnings foundation in the North America business that had been underway since the previous business plan. As measures to stimulate growth, JFE Shoji invested in a North American company developing motors for EVs, and accelerated initiatives to tap into demand for electrical steel used in EV motors. In the automotive steel fields, in addition to launching a new steel processing center in Mexico, JFE Shoji expanded capacity at its steel processing facility in China. JFE Shoji made an additional investment in a major plated and colored steel producer in Vietnam in a bid to expand its procurement and sales capabilities in the steel sheet construction materials field.

In the raw materials & machinery business, JFE Shoji entered into a long-term wooden pallet supply agreement for Tahara Biomass Power LLC at JFE Engineering, in order to ensure a supply of biomass fuel to expand the business, which helps resolve environmental

issues. In response to growing demand for steel scrap, we also updated scrap yards and increased sales of blast furnace slag.

In the increasingly important field of DX, Group company JFE Shoji Electronics Corporation collaborated with Osaka University on the development of a system to remotely perform non-destructive inspections inside various objects by attaching radars to drones.

Once commercialized, this system will be useful in a wide range of fields, such as inspections of plants, buildings, and infrastructure.

The JFE Shoji Group continues to provide new value added and services to customers through the creation of new businesses and efforts to evolve existing businesses with DX.



Steel Processing Center in Mexico

TOPICS

Environmental Initiatives

Creation of a New Organization

JFE Shoji created the Environmental Resources Division in a reorganization of the former raw materials departments with the aim of reinforcing the sales structure for environmental resources, such as biomass fuels, including palm kernel shells (PKS) and wooden pallets, blast furnace slag, and iron scrap, in response to global changes in the environment and economy, including the movement toward carbon neutrality. At the same time, JFE Shoji established the Business Development Center for the purpose of exploring and developing new business related to the environment. While coordinating with the Environmental Resource Department, we will accelerate the create of new businesses for the next generation.

Declaration of Support for the UN Global Compact

With operations around the world, through its bases and supply chains in Japan and other countries, JFE Shoji is in a position to become involved in resolutions for social issues in each region. With the aim of realizing a sustainable society, JFE Shoji plans to step up its initiatives after becoming a signatory to the United Nations (UN) Global Compact, the world's largest sustainability initiative.



In April 2021, JFE Shoji became a signatory to the UN Global Compact, declaring its support for these principles. JFE Shoji will comply with the Ten Principles of the Global Compact and endeavor to achieve the SDGs.

United Nations Global Compact
<https://www.unglobalcompact.org>

Shipbuilding Business

Japan Marine United Corporation (equity-method affiliate)

Contributing to the sustainable development of society and industry through the finest products and services in the ship and offshore field

As a leading company in Japan's shipbuilding industry, Japan Marine United, in its business fields of merchant ships, naval/ government ships, and offshore structures, aims to be a competitive shipyard that drives the maritime industry to realize a decarbonized society on the seas, leveraging its world-class environmental and energy-saving technologies. We also contribute to ensuring maritime defense and marine safety.



Kotaro Chiba
President and CEO
Japan Marine United Corporation

Strengths	Threats and risks	Opportunities
<ul style="list-style-type: none"> Advanced environmental and energy-saving technologies Marshalling of engineering and marketing resources through capital and business alliance with Imabari Shipbuilding Co., Ltd. Human resources and facilities in R&D that supports only one / No. 1 technologies in ice navigation and fuel saving High productivity that leverages the unique features of each shipyard 	<ul style="list-style-type: none"> Tougher international competition against shipbuilders become larger in China and South Korea Higher prices for raw materials and equipment Foreign exchange fluctuations 	<ul style="list-style-type: none"> Progress toward a decarbonized society <ul style="list-style-type: none"> Stronger environmental regulations Faster momentum in new fuel adoption and research Innovation of offshore wind power generation markets National moves in shipbuilding industry <ul style="list-style-type: none"> Enactment of Maritime Industry Reinforcement Act (shipbuilding, marine transportation) Passage of Economic Protection Act

Initiatives in Fiscal 2021

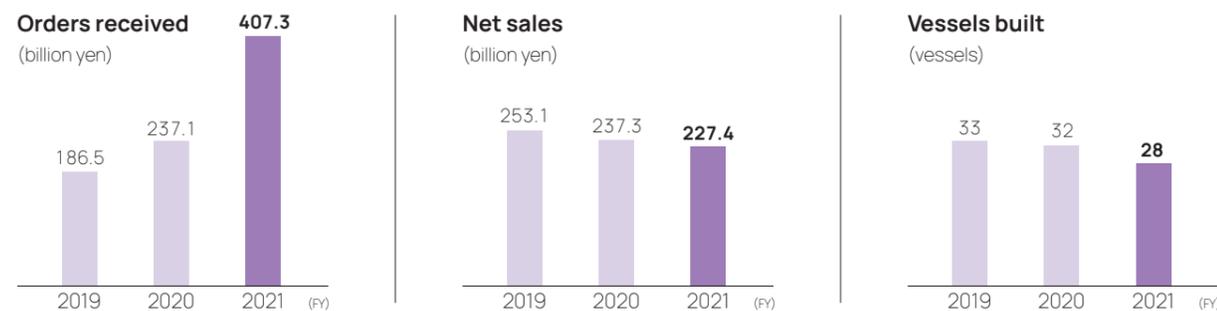
In fiscal 2020, Japan Marine United created a business plan for the next five years, laying out a vision for where it wants to be in that time, which is to be a core player that guides a maritime cluster with world-leading technologies combining the engineering strengths of shipbuilding in Japan.

In the core merchant ships business, Japan Marine United saw results from its measures to improve productivity through DX projects and improvement activities recommended by external consultants. In January 2021, Nihon Shipyard Co., Ltd. (NSY) was established as a sales and design joint venture between Japan Marine United and Imabari Shipbuilding, one of the top two shipbuilders in Japan. NSY has launched full-scale business activities and secured a sufficient amount of orders (Japan Marine United and Imabari Shipbuilding have a 50% market share in Japan). In cooperation with NSY and Imabari Shipbuilding,

JMU participated in major projects, collaborating on the construction of ships, including an ammonia-fueled ship, and advancing R&D in technologies to comply with environmental regulations. In the naval ships business, to help maintain and upgrade Japan's naval fleet, Japan Marine United is reinforcing maintenance operations with a focus on naval ships at its five bases at four business locations throughout Japan, the largest in the country. In the marine engineering business, in addition to building SEP* vessels, Japan Marine United is putting more effort into businesses related to offshore wind power generation, a growth field, and a floating offshore wind power generation project in which it participates has been selected by the Green Innovation Fund.

* SEP (self-elevating platform): These work vessels are deployed to construct offshore wind power generation facilities anchored to the seabed.

Fiscal 2021 results



Annual Highlights

JFE Holdings	
2021	
May	Formulated the JFE Group's Seventh Medium-term Business Plan
May	Held a briefing for the JFE Group Environmental Vision for 2050
June	Selected as Digital Transformation Stock (DX Stock) 2021
June	Held the 19th Ordinary General Meeting of Shareholders
July	Selected for inclusion again in FTSE4Good Index Series and FTSE Blossom Japan Index
Aug.	Held JFE Group DX Strategy briefing
Oct.	Issued JFE Group Report 2021 (integrated report)
Oct.	Issued JFE Group CSR Report 2021
2022	
Jan.	Decided to issue transition bonds
Feb.	Raised CO ₂ emissions reduction target for the JFE Group
Feb.	Issued JFE Group DX Report 2021
Mar.	Selected as Environmentally Sustainable Company in the 3rd ESG Finance Awards Japan
Mar.	Selected as Health & Productivity Stocks 2022
Mar.	Co-sponsored the 16th All-China Japanese Speech Contest

JFE Steel (Steel Business)	
2021	
Apr.	Decided to expand production facilities for electrical steel sheet at West Japan Works (Kurashiki district)
Apr.	Won 2021 Commendation for Science and Technology from Minister of Education, Culture, Sports, Science and Technology, Awards for Science and Technology (Development Category) for developing hot dip galvanizing thin steel sheet production technology with novel atmosphere controls
Apr.	Won World Steel Association's 2020 Steel Sustainability Champions Award
Apr.	Received 53rd Chiumura Industry Award for chrome ore smelting reduction process using hydrocarbon fuel burner
May	Developed world's first continuous hot-rolling high-tensile steel production technology
May	Began feasibility study for established of production and sales company for grain-oriented electrical steel sheet in India
June	Won Japan Society for Technology of Plasticity's Academic Conference Award in Fiscal 2021 for the development of the world's fastest intelligent temper rolling control technology
June	Won Special Award for 22nd Logistics Environment Awards for modal shift of steel product transportation from Hiroshima Prefecture to Chiba Prefecture
June	Started operations of No. 7 continuous casting machine in Kurashiki district
June	Won National Commendation for Invention for an eighth year in a row for structural arrest for welded structures that improves safety of ships
July	Developed system for analyzing steel sheet surface textures
July	Ship Carbon Recycling Working Group within Carbon Capture & Reuse (CCR) Study Group verified potential of zero-emission ship fuel based on carbon-recycled methane
July	Signed long-term charter agreement for three LNG-fueled ships to transport steel raw materials
July	Developed low-carbon concrete that can be used in cold climates
July	Participated in conference about ammonia fuel for ships
Aug.	Expanded joint research classes at Hiroshima University for using steel slag onshore and offshore implementing related technologies in society
Aug.	Developed system for optimizing raw material logistics plans
Sep.	Obtained ministry certification for HBL®630 thick steel plate with 780 N/mm ² and a low yield ratio for building structures
Sep.	Expanded manufacturing bases for HBL®385B-L high-strength thick steel plate for building structures
Sep.	Launched Better Recycle Shonan project to help solve the problem of plastic waste by developing steel beverage containers
Sep.	Obtained ISO 45001 certification for occupational health and safety management systems at Chita Works
Sep.	Installed system for detecting signs of equipment anomalies using data science technology at all hot-rolled steel plants
Oct.	Won Ministry of Economy, Trade and Industry's Industrial Science and Technology Policy and Environment Bureau Director-General Award for Resource Recycling Technologies and Systems in Fiscal 2021 for the establishment of closed-loop recycling technologies for used refractory material
Oct.	Novel processes for manufacturing valuable materials using coal-derived CO ₂ selected for NEDO projects
Oct.	Stress Reverse Forming™ process adopted for production of automobile parts using 1.5GPa-grade ultra-high-strength cold-rolled steel
Nov.	Developed FM1300S nickel-free alloyed steel powder
Nov.	JFE Topology Optimization Technology used in battery protection chassis structures
Dec.	Initiated operations at a plant for battery materials (anodes) via a joint venture in China
Dec.	Collaborated with Nucor and CSI in the U.S.
Dec.	Fired up No. 4 blast furnace (fourth operating cycle) in Kurashiki district
Dec.	Obtained ISO 45001 certification for occupational health and safety management systems at Fukuyama
Dec.	Won 56th Machinery Promotion Award, Japan Society for the Promotion of Machine Industry Chairman's Prize for the development of high-efficiency, ultra-narrow gap welding system
2022	
Jan.	Use of hydrogen in steelmaking process adopted as NEDO Green Innovation Fund Project
Jan.	Introduced training simulator at Fukuyama district that uses mixed-reality technology
Jan.	Developed Denjiro™ insulation-coated pure-iron powder for soft magnetic composites
Feb.	JFE Steel and Tohoku University set up the Collaborative Research Laboratory for Green Steel
Mar.	Finished transition to open environment for core systems at head office
Mar.	Won 68th (fiscal 2021) Okochi Memorial Foundation Technology Award for HBL® Series of high-strength thick steel plate with low yield ratio for building structures
Mar.	Endorsed the Ministry of Economy, Trade and Industry GX League Basic Concept for Green Transformation

JFE Engineering (Engineering Business)	
2021	
Apr.	Inaugurated JFE Environment Technology Co., Ltd.
Apr.	Finished construction and launched operations of the Onahama Biomass Power Plant with world-leading power generation efficiency
June	Established and started operations at Mori Binary Power LLC, a geothermal power generation company
July	Entered waste processing business in Malaysia
Aug.	Established Myoko Green Energy Co., Ltd. to comprehensively operate gas and water utilities
Oct.	Started commercial operations of West Japan PET Bottle MR Center (J&T Recycling Corporation)
Oct.	Decided to commercialize a 112,000kW woody biomass single-fuel combustion power plant, one of the largest in Japan, in Tahara, Aichi Prefecture
Nov.	Developed three new types of construction robot
Nov.	Entered into agreement with NTT Docomo, Inc. to jointly study the creation and commercialization of DX solutions
Nov.	Finished construction on the Kelani Bridge in Sri Lanka
Dec.	Establishment of a Promotion Council for Electric Garbage Trucks and Battery Exchange Stations
Dec.	Participated in large-scale waste to energy plant business in Vietnam
2022	
Jan.	Entered into business alliance with Ishii Iron Works Co., Ltd.
Feb.	Successfully produced methanol from waste, a first in Japan
Mar.	Opened 5G Innovation Plant testing facility with high-speed wireless communications environment inside an actual large plant
Mar.	Finished new office building at Tsu Works

JFE Shoji (Trading Business)	
2021	
May	Started operations of JFE Shoji Steel Service Center Bajio, S.A.P.I. de C.V., an automobile service center in Mexico
June	Entered into strategic partnership with Enedym Inc. in Canada
July	Received highest "Eruboshi" certification (three stars) for a company that promotes women's participation and advancement in the workplace
2022	
Jan.	Decided to expand processing functions at Kyushu-Tech Corporation
Mar.	Made an additional investment in Ton Dong A Corporation, a steel sheet manufacturer in Vietnam

Japan Marine United (Shipbuilding Business)	
2021	
June	Obtained Statement of Feasibility from DNV for newly-developed semi-submersible floating platform design for large wind turbines
Aug.	Received order for the Arctic Research Vessel
Sep.	Obtained certification from the Minister of Land, Infrastructure, Transport and Tourism for a new plan to enhance JMU's business foundation based on the Act on Strengthening Maritime Industrial Base
2022	
Jan.	NEDO's Green Innovation Fund is granted for the Joint Project for Mass Production and Reduction of Costs of Floating Offshore Wind Farms
Mar.	Successfully demonstrated navigation of automated vessel for the Nippon Foundation MEGURI2040 Autonomous Ship Program (DFAS) in which Japan Marine United participates
Mar.	Received order for special modification work on the Helicopter Destroyer "Kaga"

Special Feature: The JFE Group's Challenge (1)

1 Advancing the Commercialization of the Wind Power Generation Business Offering a Full Lineup Supply Structure

The Japanese government has positioned wind power generation as a key part of its Green Growth Strategy on the way to becoming carbon neutral by 2050. The JFE Group is working to commercialize the offshore wind power generation business by leveraging its comprehensive capabilities, centered on the engineering business.



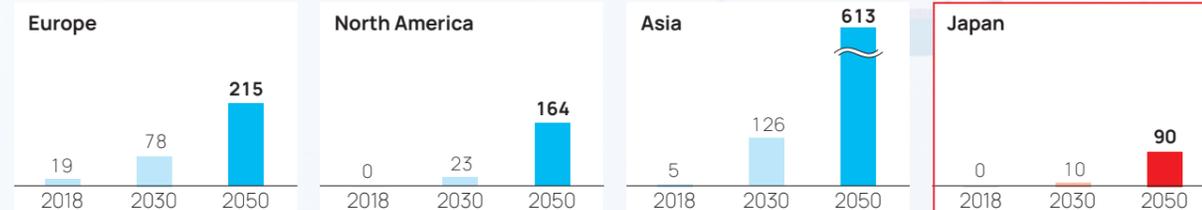
Market Trends in Offshore Wind Power Generation and Position in Japan

Offshore Wind Power Generation Gaining Momentum in Japan and Globally

Offshore wind power generation has mainly been developed in Europe and China thus far, but is poised to expand in Japan, other Asian countries, and North America. In Japan, the government is targeting projects for offshore wind power generation capacity of 10 million kW (10 GW) by 2030 and 30-45 million kW (30-45 GW) by 2040, signaling strong growth ahead. Bottom-fixed offshore

wind power is taking priority over floating platforms, and in the market for bottom-fixed monopiles, demand for steel materials is set to expand to 100,000 tons per year by 2025 and over 200,000 tons per year by the 2030s. There is also strong potential for growth in floating platforms, where technologies are being developed to enable a broad scope of installations.

Offshore wind power generation Total installed capacity forecast (GW)



Source: IRENA "Future of Wind" (2019), Japan Wind Power Association

Outlook for monopile steel demand in Japan (JFE's own forecast)



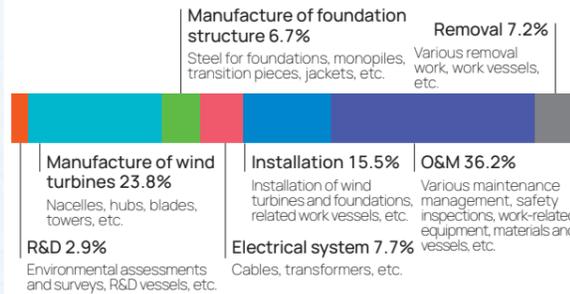
Issues Preventing Expansion of Offshore Wind Power Generation in Japan

Need for Competitive Robust Supply Chains in Japan

As offshore wind power gains traction in Japan, it is likely to have significant economic ripple effects on related industries and boost regional revitalization, considering the tens of thousands of parts required in power generation equipment and business scale on the order of several hundreds of billions of yen. However, a majority of the offshore wind power industry is currently located in foreign countries.

Forming a competitive and robust supply chain in Japan is an extremely important issue from the standpoint of economic security and energy security, including energy self-sufficiency and ensuring a reliable supply of electricity. In order to encourage the formation of this supply chain, the government is encouraging capital investment with subsidies and tax incentives for companies and setting goals for public-private coordination that includes industry players.

Overview of offshore wind power supply chain (for bottom-fixed platforms): Involves a large number of parts across broad swaths of the industry



Three Targets in Government's Vision for Offshore Wind Power Industry (First)

Rollout target	Create projects for 10 million kW by 2030 and 30-45 million kW, including floating-type wind power generation, by 2040
Domestic procurement ratio target	60% domestic procurement ratio by 2040
Cost target	Bottom-fixed wind power generation cost of ¥8-9/kWh by 2030-35

The JFE Group's Initiatives (Functions Only JFE Can Provide)

Provision of Full Lineup Supply Structure That Maximizes Group Business Know-How

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 helping 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.

Material production	JFE Steel	Manufacture of high-quality, extra-heavy steel plates for the fabrication of foundations (establishment of a mass production system in fiscal 2023)
Manufacture of foundation structure	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)
Installation	JMU	Construction of work vessels, including self-elevating platform (SEP) vessels
O&M	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
Total	JFE Shoji	Creation of supply chains with know-how accumulated in steel, raw materials, and equipment businesses

Synergies from Diverse Businesses and Group Collaboration

The JFE Group's businesses



Maximize use of Group's business know-how

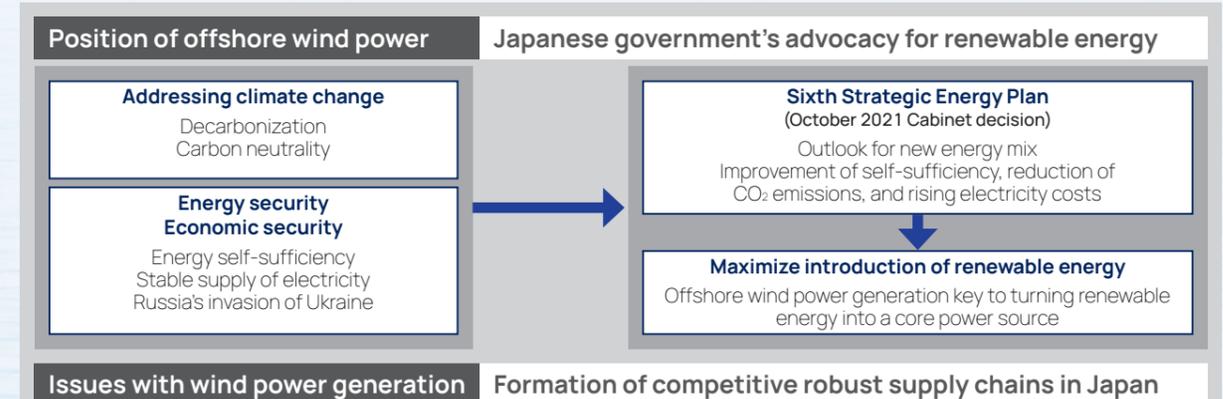
Provide full lineup supply structure for offshore wind power generation



Commercialization of Offshore Wind Power Generation Business

Greater contribution to reducing CO₂ in society and solving climate change issues
⇒ Increase corporate value by tapping into business opportunities

Realization of Carbon Neutrality by 2050



Special Feature: The JFE Group's Challenge (1)

1 Advancing the Commercialization of the Wind Power Generation Business
Offering a Full Lineup Supply Structure

JFE Group companies are generating synergies through collaborative initiatives to commercialize the offshore wind power generation business. Below, we introduce the strengths and initiatives at each company.

JFE Engineering **Bottom-fixed foundation structure manufacturing business**

Aiming to build a full lineup supply structure for bottom-fixed foundations

Offshore wind power generation is a promising source of green energy, and offshore wind power projects are ramping up in Japan. Foundation structures that support wind turbines are broadly divided into bottom-fixed type and floating type. Monopiles (MP), one of the bottom-fixed foundations, are economical where sea floors are at shallow depths of up to 30 meters, and jacket foundations can be used on sea floors at depths of up to 60 meters.

JFE Engineering began construction on Japan's first monopile fabrication plant in June 2022. The construction site is located on JFE Steel's West Japan Works (Fukuyama district), and the new plant will be supplied with extra-heavy steel plate from JFE Steel (Kurashiki district). The monopile plant will be able to produce 100,000 tons annually (equivalent to around 50 foundations for 12-MW-class offshore wind turbines) while aiming to increase efficiency in welding volume and assembly processes. The new plant is to be completed by the end of December 2023 and will start full-scale operation from April 2024 after three months of trial operations.

Tsu Works has extensive experience in large-scale steel structures, such as steel bridges and jackets for runway D at Haneda Airport. Tsu Works plans to manufacture and supply jacket foundations and transition pieces, a part that connects monopiles to wind turbine towers.

Using our extensive experience and manufacturing technologies accumulated over more than 50 years, JFE Engineering is carving out a solid position in the foundation structure field for offshore wind power generation and is ready to contribute to Japan's effort to become carbon neutral.




Tetsuo Takahashi
Offshore Wind Power Project Team
Head of Foundation Unit

JFE Engineering **O&M for offshore wind power generation**

Entry into O&M business for offshore wind farms with backing of experience and Group resources

For more than 25 years, since 1996, JFE Engineering has engaged in EPC, equipment supply and maintenance business for onshore wind farms (131 wind turbines at 25 sites). Backed by its extensive experience and knowledge of onshore wind power generation and maximizing the technologies at JFE Group companies, JFE Engineering is developing technologies and alliances to enter O&M field for offshore wind farms.

One of the issues in offshore wind farm maintenance is marine transportation to the offshore site. To further reduce the maintenance cost, it is important to be able to minimize the number of marine accesses. To achieve this, in addition to planned preventive maintenance, it is imperative to establish predictive detection technology through the analysis and management of data from various sensors such as image, vibration, and sound, as well as remote monitoring technology that enables fault diagnosis from far away. Moreover, it is necessary to reduce the work performed by people offshore and underwater through the use of drones and autonomous underwater vehicles (ROV/AUV). The development of inexpensive maintenance equipment is also needed for on-site repairs without carrying back to port. The development of these technologies and equipment can be accomplished through collaboration between external companies and JFE Group companies that have knowledge and expertise in the steel-making business, which could lead to greater business opportunities.




Satoru Aoki
Offshore Wind Power Project Team
Head of O&M Unit

JFE Steel **Production of extra-heavy plates**

Extra-heavy steel plates support tomorrow's green energy

JFE Steel has been preparing to manufacture extra-heavy steel plates using its No. 7 continuous casting machine (7CCM), which began operating in Kurashiki. In recent years, the size of offshore wind turbines has been increasing, and the foundation structures that support them have also grown larger. When fabricating these large foundation structures, manufacturing efficiency needs to be increased by reducing the amount of welding work on large steel plates. JFE Steel is making capital investment in the steel plate plant (Asia's largest class) in order to supply large volumes of high-quality, extra-heavy steel plate using ultra-large slab produced in 7CCM.

We look forward to the day that the extra-heavy steel plates manufactured by JFE Steel will be used in offshore wind turbines, supporting Japan's future energy demand in the near future.



Naoto Hirata
General Manager,
Plate Business Planning
Department

JFE Shoji **Building a supply chain to contribute to the offshore wind power industry**

Helping reduce costs and maximize regional economic ripple effects in Japan

Offshore wind power generation is a final resort to turn renewable energy into a core power supply, and the government's Vision for Offshore Wind Power Industry targets a 60% domestic procurement ratio by 2040 as Industry's target, in a bid to spur the creation of a supply chain in Japan.

JFE Shoji aims to maximize the ripple effects on national and regional economies by proposing optimal solutions to customers and building a supply chain centered on the resources of JFE Group companies and existing partners, which are potential suppliers, while leveraging its accumulated business acumen in the sale of steel, processed products, raw materials, and machinery.

JFE Shoji will contribute to the realization of carbon neutrality and the development of the offshore wind power industry by offering choices from a number of suppliers (including global suppliers) that can help reduce costs.



Akira Satoh
Staff Manager of Business
Development Center, Business
Collaborating Promotion Team

Japan Marine United **EPCI* of floating platform system for wind turbine and construction/maintenance support vessels for wind farms**

Developing floating platform system while using the Green Innovation (GI) Fund

Japan Marine United Corporation (JMU) has finished obtaining feasibility certification from Det Norske Veritas (DNV) for the development of next-generation, semi-submersible platform ideal for sea condition around Japan, while leveraging its experience from participating in a floating offshore wind farm research project off Fukushima. Since March 2022, as a leading member of the consortium, JMU has been awarded to use NEDO's Green Innovation (GI) Fund to advance R&D toward commercialization. JMU aims to establish mass production and lower the overall costs of floating platform system, including mooring and installation work, in addition to engineering and construction of the floating platform itself. Recently, using GI Fund, JMU finished construction at its Maizuru Works on a one-ninth scale model of a floating platform for the purpose of testing a hybrid mooring system off Akita. JMU is also currently constructing its second and third SEP vessels and is considering the construction of cable-laying vessels, anchor handlers, and service operation vessels for use in construction and O&M of wind farms.




Masaki Iwamoto
Head of Offshore & Engineering Project Department, Offshore & Engineering Division

Special Feature: The JFE Group's Challenge (2)

2 Contributions to Resolving Climate Change

—Aiming for carbon neutrality by 2050

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.



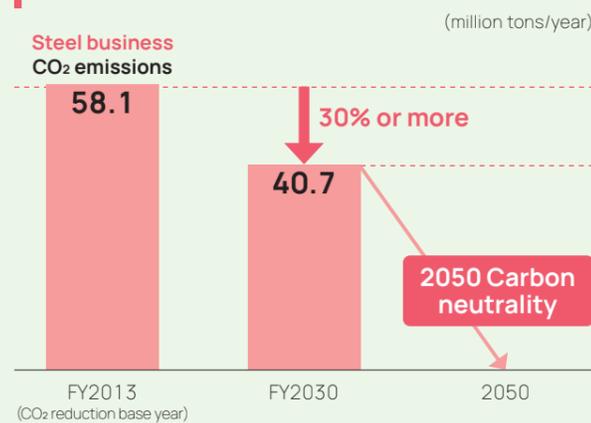
JFE Group Environmental Vision for 2050

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.

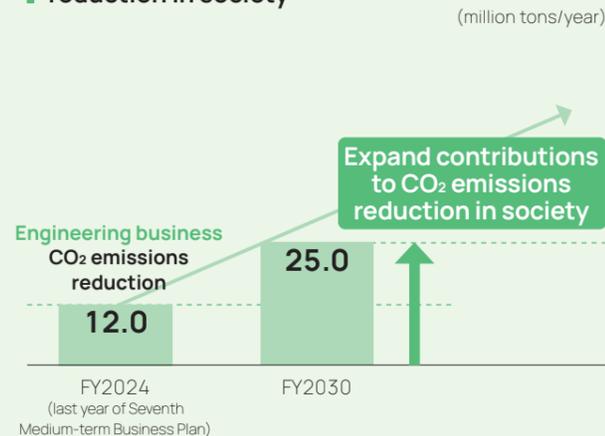
In the steel business, we aim to cut CO₂ emissions by at least 18% by the end of fiscal 2024 compared with the fiscal 2013 level. The JFE Group targets a reduction of more than 30% in CO₂ emissions by the end of fiscal 2030, compared with the fiscal 2013 level. To explore all possibilities for realizing

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 in society as a whole by expanding and advancing renewable power generation and carbon-recycling technologies, by supplying high-performance steel products, and through other initiatives. Furthermore, we will accelerate commercialization of our offshore wind power business by applying the strengths of the Group.

Steel business Carbon neutrality by 2050



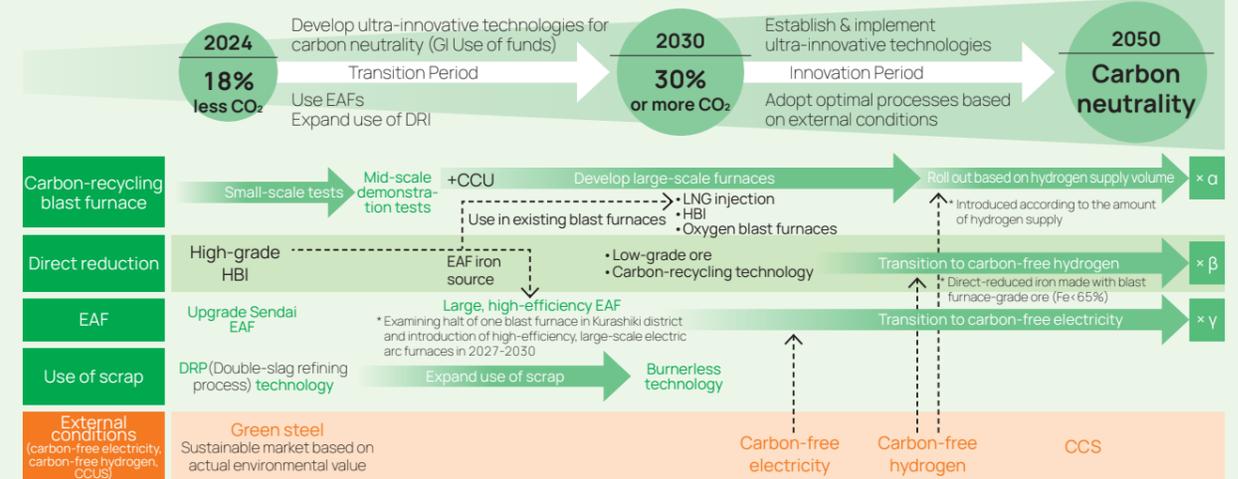
Engineering business Expand contributions to CO₂ emissions reduction in society



Outline of Process Conversion to Become Carbon Neutral

- Introduce the most proven technologies while pursuing multilayered technology development
- Aim to become carbon neutral by 2050 by applying optimized processes to steelworks

Roadmap to carbon neutrality



Development of Ultra-Innovative Technologies

Experiments related to the project of using hydrogen in ironmaking commissioned and subsidized by NEDO in order to become carbon neutral

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 the New Energy and Industrial Technology Development Organization (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 by constructing development facilities in the same district.

Details of Plan for Experiments

- Carbon-recycling blast furnace (150 m³ 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

Issuance of Transition Bonds

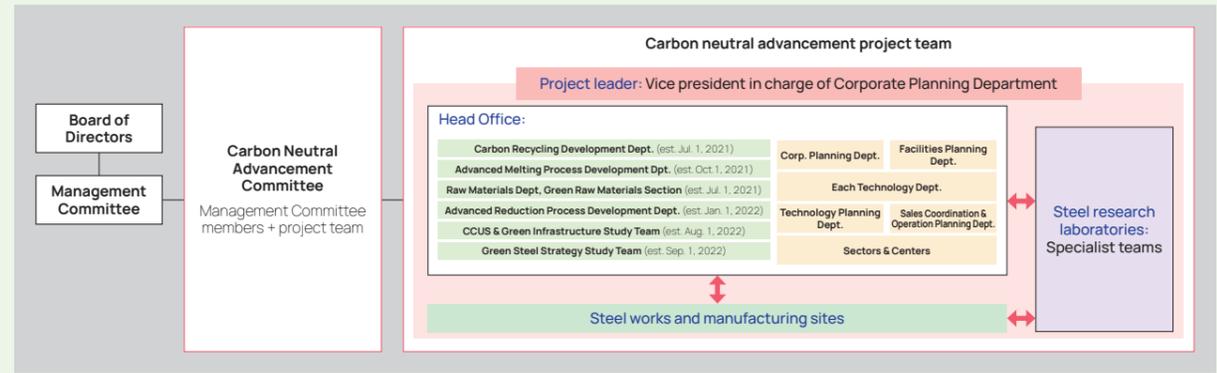
The JFE Group's Environmental Vision for 2050 requires significant funds for capital investments and R&D. In fiscal 2022, the JFE Group publicly issued 30 billion yen in transition bonds. These bonds were selected as a model example for the Ministry of Economy, Trade and Industry's Climate Transition Finance Model Project for 2021—a first in Japan's manufacturing industry. The raised funds will be allocated to capital

investments, operating capital and R&D for initiatives related to conserving energy and increasing efficiency, producing eco-products, developing ultra-innovative ironmaking processes, and promoting renewable energy. We believe these bonds will also lead to the diversification of fundraising methods, and we will pursue the optimal procurement of funds through various means.

2 Contributions to Resolving Climate Change –Aiming for carbon neutrality by 2050

Carbon Neutral Promotion Structure for Steel Business

In October 2020, JFE Steel created a companywide project team that reports directly to the president to guide efforts toward becoming carbon neutral by 2050, including by developing innovative technologies and working to realize practical application. Additional units set up from July 2021 are now helping to reform internal structures and accelerate initiatives to advance toward carbon neutrality.





Takashi Watanabe
Manager, Technology Planning Dept.

Moving from every angle to become carbon neutral

The JFE Group creates and manages short- and medium-term plans for reducing CO₂ emissions, and also creates longer-term roadmaps for becoming carbon neutral by 2050. In the Green Innovation Fund Project, the JFE Group is working closely with NEDO and consortium members to efficiently engage in R&D in carbon neutrality from various perspectives. The challenge of becoming carbon neutral will require painstaking efforts to gradually create new and change existing ironmaking processes. The cost will be sizable, and with no clear solution in sight, we must consider a way forward that includes policy assistance from the national government. Although the issues are daunting, with the cooperation of everyone in relevant departments, I believe we can make steady progress toward becoming carbon neutral in the future.

Aiming to create world's first carbon-recycling blast furnace

Carbon recycling entails the capture of CO₂ as a carbon resource and reusing it in various carbon compounds. To incorporate this initiative in blast furnaces, we are developing carbon-recycling blast furnaces, but face many hurdles because this technology has not been proven anywhere else in the world. In coordination with the ironmaking research department, which is researching technologies for controlling reactions within the carbon-recycling blast furnace, we will move steadily toward the commercialization of carbon-recycling blast furnaces. First, we plan to construct a small-scale pilot blast furnace in the Chiba district and commence trials with the aim of sorting out technical issues. We will develop technologies with the intention of delivering to customers steel produced in carbon-recycling blast furnaces.



Hajime Wakai
Manager, Carbon Recycling Development Dept.

Information Disclosure Based on the TCFD Recommendations



TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

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 steelmaking 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 CSR 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 the end of fiscal 2030

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 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, which has a major impact on the environment, 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 CSR 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 CSR 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 CSR, 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.

Special Feature: The JFE Group's Challenge (2)

2 Contributions to Resolving Climate Change –Aiming for carbon neutrality by 2050

Methods of monitoring issues relating to climate change

The JFE Group CSR Council, the Group Management Strategy Committee, and the Management Committee monitor issues 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.

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 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 the end of 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 end of fiscal 2030 CO₂ emissions reduction target to a 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.

TCFD Content Index

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

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.

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

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 newly evaluated, 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.

	Societal changes and responses to changes	Expectations and concerns of stakeholders towards the JFE Group	Evaluation results
1.5°C /2°C scenario Important factor 1 Decarbonization in steel production processes	Rising societal demands for decarbonization towards steel production processes Implementation of innovative technologies that achieve large-scale decarbonization Implementation of carbon pricing	<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 	Opportunities <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 Risks <ul style="list-style-type: none"> 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)
1.5°C /2°C scenario Important factor 2 Increase in demand for the effective use of steel scraps	Increased focus on electric arc furnace method, which emits low levels of carbon Rising expectations toward electric arc furnace steel Increase in scrap generation	<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 	Opportunities <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
1.5°C /2°C scenario Important factor 3 Change in demand for steel for automobiles and others	Change in automobile needs Increase of EV motors Decrease of internal combustion engines Reduction of weight and the increased use of multi-materials Rising demands for eco-friendly raw materials Demand for decarbonization and recyclability	<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 	Opportunities <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 Risks <ul style="list-style-type: none"> Limited impact of the increased use of multi-materials
1.5°C /2°C scenario Important factor 4 Increase in demand for solutions promoting decarbonization	Shifting to decarbonization Increase in demand for solutions promoting transition toward decarbonization Overseas development of energy conservation technologies	<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 	Opportunities <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
4°C scenario Important factor 5 Procurement of raw materials becomes unstable due to increased frequency in climate disasters	Intensifying climate disasters alongside rising temperatures Procurement of raw materials becomes unstable	<ul style="list-style-type: none"> Procurement of raw materials becomes unstable 	Risks <ul style="list-style-type: none"> Undergoing concrete measures "Alternative procurement methods and source distribution" and "Strengthen capabilities of facilities"
4°C scenario Important factor 6 Damages to business bases due to climate disasters	Intensifying climate disasters alongside rising temperatures	<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 	Risks <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
4°C scenario Important factor 7 National resilience	Intensifying climate disasters alongside rising temperatures Increase in importance of strengthening infrastructure Increased demand for disaster prevention products	<ul style="list-style-type: none"> Contribution with steel and related products that help strengthen infrastructure 	Opportunities <ul style="list-style-type: none"> Strengthening infrastructure with steel and related products

Human Capital

The JFE Group proactively engages in human capital management and aims to enhance corporate value over the medium and long terms by investing in human resources and drawing out the best of their abilities and vitality. In particular, the JFE Group is focusing efforts on ensuring occupational safety and health, the basis for its diverse human resources to work with motivation, and on securing and training diverse human resources through initiatives to hire and train personnel and create workplaces that motivate workers.

Securing and Training Diverse Human Resources

Basic Stance

The JFE Group views the securing and training of diverse human resources as one of its materialities. In order to beat global rivals in an increasingly complex, diversifying and changing business environment, we believe it is essential to invest in human capital. We are updating workplaces so that all personnel can utilize their abilities to their fullest and endeavoring to accumulate and pass down to the next generation the technologies and skills of veterans.

Diversity and inclusion

Positioning the promotion of diversity as an important management issue, the JFE Group is advancing initiatives to draw out all the abilities of its employees of diverse backgrounds, such as gender, nationality, value systems, and varying lifestyles, in order to rapidly and properly respond to quickly changing business conditions.

Management must be committed to diversity to see it flourish. Working in unison, we are formulating and rolling out Companywide policies that include setting up diversity 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 starting in fiscal 2022, set a new target for women to be in at least 10% of management positions (section manager or up) by 2030 (at least 20% in management and sales divisions). At each operating company, we are working to train and promote women to management positions by holding networking events inside and outside their companies, such as social events for female employees, mentoring programs and external training opportunities. At JFE Shoji, for example, we hold joint training for female employees and their managers, and aim to nurture a career support mindset among managers and career development mindset among women.

We strive to employ women at manufacturing sites. Since 2012, JFE Steel has targeted a hiring ratio of at least 10% women for regular positions, and many female employees currently work at

steelmaking sites Companywide. JFE Steel has made work environments better for female employees, such as by updating infrastructure in shower and locker rooms, and by enhancing training for entry-level positions. JFE Steel also focuses on measures to balance work with life events, enhancing systems for achieving work-life balance and creating childcare centers at major business locations, so women can pursue careers without worrying about life events.

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.

JFE Group proactively hires and promotes diverse personnel, including experienced workers from different sectors, and its mid-career hires represent one-fourth the total number of hires. At JFE Engineering, approximately 80 local employees of overseas Group companies are constantly rotated to Japan in order to nurture a corporate culture of mutual understanding that bridges differences in cultures and customs. Moreover, we continue to promote cultural reforms inside companies by organizing teams of diverse employees to work across organization boundaries.

Noteworthy examples of successful efforts are shared among operating companies, encouraging further advances in diversity across the entire JFE Group.

Advancement of personnel training

The JFE Group is unified in its efforts to improve the abilities of each and every employee, while placing emphasis on the training of global human resources for expanding overseas businesses.

Accumulation and passing down of technical knowledge and skills

At JFE Steel, we believe improving the technical knowledge and skills of all employees at manufacturing sites is a source of competitiveness for supplying high-quality products. Through our

personnel training system, we quantitatively measure, analyze, and deploy the skill levels of each employee. As generations of employees change at worksites, it is important to raise the skill

levels of young employees in particular. By training young employees based on technical data stored in systems, we are able to quickly raise their skillsets to higher levels.

Using mixed reality (MR) and other IT tools, we are training

Training of data scientists

The JFE Group is active in securing and developing the human resources necessary to pursue a DX strategy in each business domain.

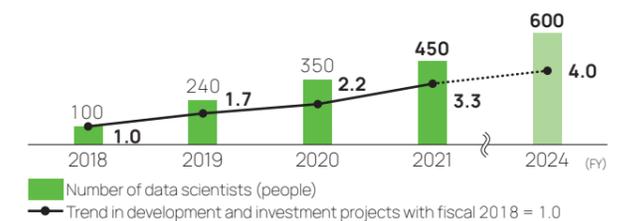
Data science (hereinafter "DS") technology is being applied in industry at a rapid pace. In order to incorporate DS technology into its business processes, JFE Steel has established a system to independently foster data scientists in-house. Having knowledge unique to the field of the steel industry is essential to applying DS in actual manufacturing and 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.

As of the end of fiscal 2021, we have trained about 450 in-house data scientists, increasing by 3.3 times the number of DS-related

employees with simulations that cannot be experienced in the classroom for a more effective and efficient curriculum. We are thus making improvements toward a more in-depth approach to training even higher-quality personnel.

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 2024.

Training of data scientists (JFE Steel)



Securing and developing global human resources

It is essential for the JFE Group to secure and develop global human resources to enhance its competitive strength in the global market.

JFE Steel provides overseas training opportunities for its young clerical employees to work at local offices and subsidiaries, for young engineers to give technical guidance at overseas affiliates, for mid-career employees to obtain MBAs overseas, and for managers to study foreign languages overseas, in order to develop the assets required for leading a global business. JFE Steel has provided opportunities for global human resources development to approximately 330 employees since 2014.

JFE Engineering provides training programs for human resources involved in overseas projects according to the skills necessary for each position. Project managers learn quality control, process

control, and other project management skills, and administrators learn tax, legal, trade and transportation, personnel administration, risk management, and other skills, both of which are designed to gain the comprehensive skills required to carry out overseas projects.

JFE Shoji creates opportunities for young employees to take training, in addition to dispatching them overseas for training and studying abroad. Talented overseas employees hired at overseas local affiliates and operating companies are provided with overseas staff management training at the head office in Japan, in addition to extended-stay training in Japan to eventually promote them as executives. Through these and other efforts, JFE Shoji is promoting bilateral globalization with overseas Group companies.

Creation of rewarding workplaces

In order to sustain development, the JFE Group is conducting a sweeping review of work styles with the understanding that it is essential to establish work styles where all employees feel proud and motivated about their work, while creating new value with high productivity.

When responding to the state of emergency during the COVID19 pandemic, new lifestyles and work styles became entrenched throughout society. Eyeing these changes, the JFE Group has updated its work environments and internal systems so that its employees can work safely and without worry, while maximizing their abilities.

JFE Steel is promoting a new work style that helps increase employee productivity, maximizes output, and improves engagement. As specific measures, JFE Steel is promoting telework by expanding its work-at-home system, introducing a core-less flex-time system, moving to unassigned desks at the head office, rolling out online chat and web conference tools, advancing robotic

process automation (RPA), promoting paperless workflows, and removing the use of seals with workflows. Through these initiatives, JFE Steel is shifting to a high-value-added work style while furthering changes in the corporate culture. The company also conducts an employee engagement survey once per year in order to periodically understand employee awareness, identify issues related to work motivation, and examine related measures. These measures are also being undertaken at operating companies.

JFE Engineering has created flexible work styles through a remote work system introduced in fiscal 2021, which allows employees to choose to work at home or at shared office spaces in approximately 400 locations across Japan, in addition to initiatives in steel centered on the Smart Work Promotion Office.

JFE Shoji is examining what the new office will look like in the future with a robust communications environment, launching a project team to examine new work styles with the aim of realizing more efficient and flexible ways to work.

Ensuring Occupational Safety and Health



Basic Stance

The JFE Group has identified ensuring occupational health and safety as a material issue. In order to sustain business activities, our basic stance is to prioritize safety above all else and help employees and their families maintain their mental and physical health. Working together with Group companies and our partners, we aim to create safe and healthy workplaces.

Prevention of workplace accidents

In its varied business activities, the JFE Group has worksites where work carries with it a relatively high risk of accidents and injuries, such as work performed in high places, under high temperatures, and with heavy objects being carried around. With diverse employees working on-site, including older people and women, our basic requirement is that each and every employee can work without worrying about their health and safety, by maintaining safe work environments and preventing workplace accidents.

Management structure for health and safety

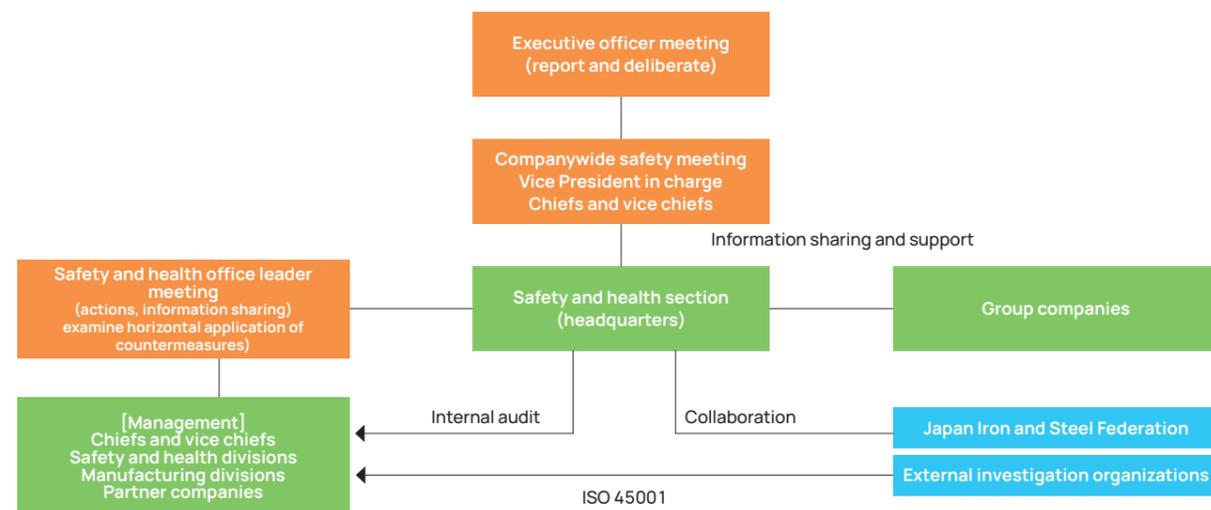
JFE Steel conducts risk assessments as an activity to reduce the risk of accidents. By assessing risks at the planning stages of equipment installations and before scheduled and unscheduled equipment maintenance, JFE Steel prevents and reduces the risk of accidents. We aim to lower the risk of injury caused by the actions of workers by pursuing the safest measures for operating equipment.

In the event that an occupational injury occurs despite these efforts, JFE Steel spares no effort in investigating the cause of the accident and preventing a reoccurrence. A committee to investigate the accident is rapidly established to delve into the causes of the accident in the relevant department and proposes countermeasures, following through until completion of the process. The results of the investigation are shared by the committee with the relevant department and the labor union, while steps are taken to

prevent a similar accident from occurring. Moreover, for serious accidents, countermeasures are applied horizontally across the entire company, and the Board of Directors is kept abreast of progress until the countermeasures are fully implemented across the Company. This framework is described and thoroughly operated in accordance with Companywide rules.

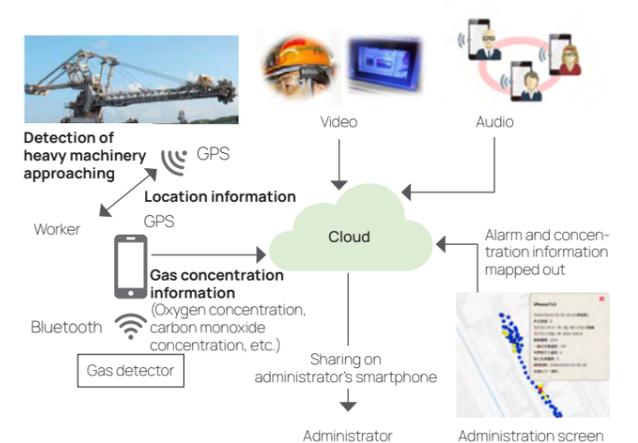
When an occupational injury occurs, the Company immediately reports it to the JISF. After the cause of the accident is determined and countermeasures are decided, the Company follows up with another report. When a serious accident occurs, the Company immediately submits a report on safety, disaster preparedness, and environmental conditions to the Ministry of Economy, Trade and Industry, the Ministry of Health, Labour and Welfare, and the JISF. The JFE Group also endeavors to prevent accidents throughout the entire steel industry.

JFE Steel's Management Structure for Health and Safety



Securing the safety of employees using AI

In the steel business, we ensure the safety of workers at manufacturing sites by utilizing the latest ICT, AI, and data science to pursue the development and commercialization of further advanced technologies. One example is the use of the safety support system. This system has communications functions such as audio and video sharing within the Group, and also allows the sharing of information including the locations and status of workers, detection of approaching heavy machinery, and operational environment such as the presence of gas, to ensure the safety of workers. This information is also shared to administrators through smartphones and the cloud. We will continue to strive to secure the safety of workers using the latest technology.



Activities of Group companies

JFE Steel	JFE Engineering	JFE Shoji
JFE Steel has set the objective of achieving an industry-leading safety record, and is putting into practice self-guided safety activities. Management is also creating an occupational health and safety management system based on the ISO 45001 international standard. Four business sites have already obtained this certification, and JFE Steel is working toward getting all domestic business sites certified during fiscal 2022.	JFE Engineering has set shared Company-wide priorities that must be adhered to by all of its employees and the employees of its partner companies. Focusing on eradicating work injuries, management promotes safety measures while identifying the sources of risks through risk assessments that take into account the uniqueness of operations in each business division. As a new initiative, JFE Engineering is taking a multi-faceted approach to occupational health and safety management with the use of IT for the surveillance and detection of risks.	JFE Shoji aims to achieve zero serious injuries at coil centers and other processing bases, and has set the goal of eliminating unsafe work that could result in serious injuries. Patrolling worksites to identify unsafe work conditions, JFE Shoji is taking steps to improve facilities. Management aims to enhance the level of occupational health and safety activities at each company by sharing knowledge and information through safety managers assigned to each Group company.
Lost-work injuries rate (FY2021) KPI: -0.10 Results: 0.10	Lost-work injuries rate (FY2021) KPI: -0.25 Results: 0.10	Lost-work injuries rate (FY2021) KPI: -0.45 Results: 0.60

Ensuring the health of employees and their families

In order to realize safe and highly attractive workplaces that provide motivation to workers and to powerfully promote the development of environments where diverse human resources can demonstrate their full potential, the JFE Group has formulated the JFE Group Health Declaration and collaborates with its health insurance union and industrial health staff to strengthen employee

health. We are focusing our efforts on helping employees and their families maintain and improve their health, such as preventing passive smoking by reducing the ratio of smokers at work. In fiscal 2021, the JFE Group achieved its KPI target of reducing the percentage of smokers (total at operating companies) by 1.5% annually.

External recognition

We believe that health and productivity management will be greatly facilitated not only by the individual actions of Group companies but also by recognition from outside. Accordingly, we actively cooperate with outside surveys.

Name of SRI index, etc.	Description of selection criteria, etc.	Evaluation, etc.
Health & Productivity Stock Selection Program	JFE Holdings was designated as a Health & Productivity Stock 2022 by the Ministry of Economy, Trade and Industry and the Tokyo Stock Exchange. The Health & Productivity Stock Selection Program chooses companies from among stocks listed on the Tokyo Stock Exchange that have excelled at strategically implementing employee health management from a business management viewpoint. These stocks are presented as attractive companies to investors that emphasize improvements in corporate value over the long term. Additionally, JFE Holdings and Group companies (JFE Steel and JFE Engineering) were selected in 2022 for the Certified Health & Productivity Management Outstanding Organizations Recognition Program (White 500), which certifies organizations that implement outstanding health management in collaboration with health insurance society members. This marks the second time, after a four year hiatus, that JFE Holdings has been selected as both a Health & Productivity Stock and a Health & Productivity Management Outstanding Organization.	
DBJ Employees' Health Management Rated Loan Program	This is the first financing option in the world to incorporate special health management ratings, which uses the unique screening system developed by the Development Bank of Japan (DBJ) to evaluate and select companies with excellent health management initiatives for employees, whereby setting financing terms and conditions according to the evaluation result. The Company was rated as a top-ranking company with excellent advanced initiatives for employees' health management in 2018 in recognition of our advanced health management so far.	