

STEEL  
ENGINEERING  
SHOJI TRADE



JFE Group  
**CSR REPORT 2019**



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## Editorial Policy

This report provides stakeholders with information about the JFE Group's CSR activities and elicits feedback to support further enhancement of the company's activities and information disclosure. The 2019 report includes:

- Social issues, risks, opportunities, and initiatives associated with our value chain for each business category
- Evaluation of KPIs for material CSR issues based on performance results for FY2018 and the use of those results to review KPIs for FY2019
- Presenting the Group's long-term vision on climate change issues and disclosing information on climate change risks and opportunities in line with TCFD recommendations such as scenario analysis

## CSR Report Composition and Format

### CSR Report

(This report Booklet or PDF on website)

Reader-friendly summary of CSR initiatives

A detailed report on corporate governance can be found in the integrated report.



### Environmental Data Book (PDF on website)

Detailed environment data

## Scope of Report

### Reporting Period

FY2018 (April 1, 2018 to March 31, 2019)

Reports on some activities undertaken before or after this period are included.

### Organizations Covered

The report mainly covers the activities of JFE Holdings, Inc. and its three operating companies: JFE Steel Corporation, JFE Engineering Corporation, and JFE Shoji Trade Corporation, but also includes reports on activities of other companies in the JFE Group (383 companies, of which 313 are consolidated subsidiaries and 70 are equity-method affiliates).

Quantitative information includes data from the following JFE Group's operating companies (see Environmental Data Book for a complete list of companies).

- JFE Steel group  
"Environment and CO<sub>2</sub> Emissions" section: JFE Steel and 30 consolidated domestic and overseas subsidiaries  
Other environmental data: JFE Steel and 25 consolidated domestic subsidiaries
- JFE Engineering group  
"Environment" section: JFE Engineering and 10 consolidated domestic subsidiaries
- JFE Shoji Trade group  
"Environment" section: JFE Shoji Trade and 33 consolidated domestic and overseas subsidiaries

## Reference Guidelines

GRI Sustainability Reporting Standards 2016 and 2018

Ministry of the Environment (Japan): Environmental Reporting Guidelines 2018

Ministry of the Environment (Japan): Environmental Accounting Guidelines 2005

## Publication Date

Website: September 2019; booklet: October 2019

(previous issue: October 2018; next issue: scheduled for October 2020)

## Related Reports

The following information is available at <http://www.jfe-holdings.co.jp/en/>

### CSR (Society and Environment)

CSR reports (CSR Report and Environmental Data Book) in PDF format providing the latest information on CSR initiatives.

### Company Profile

Outline of the JFE Group, corporate governance, etc.

### Investor Information

JFE Group business information, financial data, stock and rating information, etc.

### JFE GROUP Report (Integrated Report)

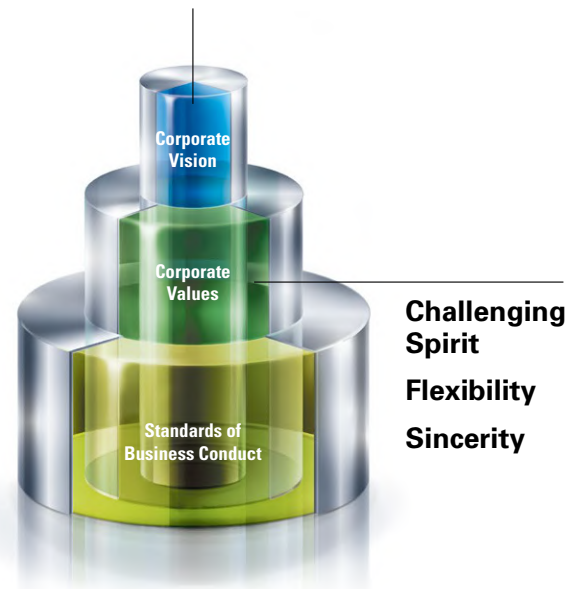
Financial information including the JFE Group's mid- to long-term business strategies, business performance, management strategies and non-financial information, including CSR activities, corporate governance, etc.

# JFE Group's CSR

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

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

**Contributing to society  
with the world's most  
innovative technology**



## JFE Group Standards of Business Conduct

All JFE Group personnel are required to faithfully adhere to the following Standards of Conduct in all corporate activities. These standards embody the JFE Group's Corporate Vision and go hand in hand with its Corporate Values.

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

Senior managers are also responsible for measures to prevent the recurrence of any violation of these standards. Additionally, they must report violations promptly and accurately to internal and external stakeholders, determine the persons of relevant authority and accountability, and resolve matters rigorously.

### 1. Provide quality products and services

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

### 2. Be open to society

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

### 3. Work with communities

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

### 4. Globalize

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

### 5. Exist harmoniously with the global environment

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

### 6. Maintain proper relations with governments and political authorities

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

### 7. Maintain crisis readiness

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

### 8. Respect human rights

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

### 9. Provide challenging work environments

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

### 10. Comply with laws and ordinances

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

# Leveraging the World's Most Innovative Technologies and the Group's Collective Strength to Contribute to the Creation of a Sustainable Society

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## Pursuing the JFE Group's Sustainable Growth and Contributing to Society's Sustainable Development

I was appointed as president and CEO of JFE Holdings in April 2019.

The JFE Group has strived to enhance its corporate value to satisfy all of its stakeholders by committing to the corporate vision, "contributing to society with the world's most innovative technology." Amid a rapidly changing business environment, we have leveraged our comprehensive strengths gained through our broad range of businesses centered on iron and extending to steel, engineering, and trade in order to provide solutions that contribute to society's sustainable development.

Uncertainty is increasing across the globe and for the business environment in which we operate due to intensifying trade friction caused by protectionist policies, downside risks to emerging economies including China, and problems surrounding Britain's withdrawal from the EU. Although the Japanese economy is currently in a moderate recovery backed by rising capital expenditures and other factors, we cannot be too optimistic from a long-term perspective because domestic demand is likely to decline slowly due to the population decrease and aging of society. As for international society, concerns for the environment, particularly climate change, have significantly increased, and the concept of creating a virtuous cycle of environmental protection and economic growth was discussed at the Group of 20 summit in Osaka in June 2019.

Amid these circumstances, the JFE Group has formulated the Sixth Medium-term Business Plan to guide our business operations for FY2018 to FY2020. Under the plan, we are taking full advantage of our state-of-the-art technologies, advanced information technologies, Group coordination, and diverse workforce to push ahead with our growth strategy, to reinforce production capabilities, and to promote overseas business. Furthermore, as part of our plan to strengthen the business structure for sustainable growth, we have placed high priority on contributing to the establishment of a sustainable society and are thereby dedicating our efforts to continuously addressing ESG issues.

## Sustainable Society Supported by the Value of Steel

Iron makes up approximately 30% of the Earth's mass, while iron ore reserves represent 85% the planet's metal resources. The abundance of this resource has enabled mass production of steel at low cost. In addition, Japan's steel industry demonstrates excellent energy efficiency, which contributes to the production of steel with the lowest environmental impact in the world. The JFE Group is committed to the development of a sustainable society by responding to the increasing demand for steel that accompanies the development of the world's economy and by producing steel at low cost and with low environmental impact. Moreover, the content of steel can be adjusted to develop high-quality, high-functioning material for various social needs. Steel is also a highly recyclable material that can be easily collected and separated using magnetic force. Therefore, it can be recycled endlessly and into an infinite variety of products.

The JFE Group seeks to support the development of a sustainable society and economy by providing steel and continuing to work on advancing the material and further reducing its environmental impact. I hope this report will help all of our stakeholders more clearly appreciate the value of steel.

## Addressing Climate Change and ESG Issues

Addressing climate change issues is critical for realizing a sustainable society. The JFE Group regards reducing environmental impact and addressing climate change as particularly key management concerns and directly faces them to achieve sustainable growth for the company. Japan's steel industry has led the way in technological progress. Energy consumption in Japan per tonne of steel produced using blast furnaces is the lowest in the world. To reduce environmental impact further, we are taking part in the Japan Iron and Steel Federation's "Commitment to a Low Carbon Society," an initiative for reducing CO<sub>2</sub> emissions by 2030 by promoting energy conservation and developing innovative technologies. With an eye toward the year 2100, JISF's long-term vision for climate change



## Koji Kakigi

Representative Director, President  
and CEO of JFE Holdings, Inc.

mitigation was formulated in 2018 to address global warming. This represents our willingness to develop super-innovative technology that contributes to zero CO<sub>2</sub> emissions in the steel production process. The JFE group will use the initiative to leverage the development of breakthrough technologies in the process of achieving zero-carbon steel. We are now focusing on the research and development of epoch-making technologies, including the use of new types of raw materials such as ferro coke, hydrogen reduction iron making, and technology for CO<sub>2</sub> capture, utilization, and storage (CCUS).

As for ESG issues, we are continuing our initiatives related to the environment and society as well as efforts to enhance governance, and we disclose our progress in these areas as necessary. One environment-related topic is the move to promote disclosure of financial data pertaining to climate change. The JFE group declared its support for the Task Force on Climate-Related Financial Disclosure (TCFD) Recommendations in May 2019, and the JFE Group CSR Report 2019 discloses information in line with TCFD guidelines. By conducting forward-looking scenario analysis, we have confirmed the JFE Group's strategy to achieve resilience in the face of climate-related risks and opportunities. Looking ahead, we will make every effort to implement and deepen these strategies.

### Follow-up on KPIs to Resolve Material CSR/ESG Issues

In order to maintain the sustainability of the Group as a whole, it is extremely important to recognize the CSR

and ESG challenges of the Group's global business and respond to the associated risks and opportunities. In this report, we treat our steel, engineering, and trading companies as well as all of our stakeholders including suppliers and clients as a single value chain and present CSR and ESG challenges associated with each of them and how they are currently being managed.

Looking at the needs of diverse stakeholders, the JFE Group has identified material CSR issues in the Group's business activities and set up KPIs for each operating company as a means of evaluating each of their initiatives. In the 2019 report, we disclosed our initiatives for FY2018 as well as their results and evaluation. We also partially revised our KPIs for FY2019. We will continue responding to each issue, reinforce measures for CSR management, and enhance Group resilience and sustainability.

### Maintaining Public Trust

Under the JFE group's corporate vision of contributing to society with the world's most innovative technology, we will deliver solutions that leverage our comprehensive strength and thereby strive to maintain the Group's sustainable growth, increase our corporate value, and ensure the development of a sustainable society.

# Businesses to Ensure Sustainable Societies

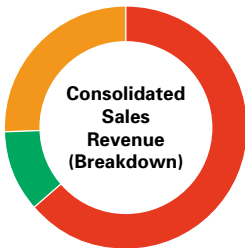
## JFE Group in Society

### Maximizing Corporate Value

JFE Holdings sets JFE Group strategies and procures funding as the holding company of the Group. It also is responsible for disclosing information to the public as a listed company. Each operating company, having developed systems suited specifically to its respective business, helps to maximize corporate value by emphasizing competitiveness and profitability aimed at sustainable growth.

#### Corporate Profile (as of March 31, 2019)

<b>Company Name</b>	JFE Holdings, Inc.
<b>Head Office</b>	2-2-3 Uchisaiwaicho, Chiyoda-ku, Tokyo 100-0011, Japan
<b>Established</b>	September 27, 2002
<b>Capital</b>	147.1 billion yen
<b>Employees (consolidated)</b>	62,083
<b>URL</b>	<a href="http://www.jfe-holdings.co.jp/en/">www.jfe-holdings.co.jp/en/</a>



**3,873.6** billion yen

- Steel Business  
63.7% (2,830.6 billion yen)
- Engineering Business  
10.9% (485.8 billion yen)
- Trading Business  
25.4% (1,125.8 billion yen)

Adjustments for intra-Group transactions totaled 568.6 billion yen, including internal sales revenue between segments amounting to 388.9 billion yen in steel business, 14.1 billion yen in engineering business, and 165.5 billion yen in trading business.

The JFE Group changed its accounting standards from JGAAP to IFRS in FY2018.

### Steel Business

- JFE Steel Corporation
- Head Office: Chiyoda-ku, Tokyo
- Sales Revenue (consolidated): 2,803.6 billion yen
- Segment Profit (consolidated): 161.3 billion yen
- Employees (consolidated): 44,975

### High-performance Products that Respond to Customer Needs

JFE Steel, one of the world's leading integrated steel producers, operates a highly competitive production system consisting of two major steelworks, one each in eastern and western Japan. The company's value-added products reflect JFE Steel's sophisticated technologies and development.

### Examples of Contributions to Sustainability

- S-1** Development of high-performance steel materials that reduce environmental impact and energy-saving products
- S-2** Development and global deployment of energy-saving technologies for manufacturing
- S-3** Steel scrap recycling and effective utilization of iron and steel slag



JFE technologies developed mainly for steel are being used worldwide for new applications in energy, resource recycling and more. JFE is now leveraging innovative world-class technologies from its three core businesses of steel, engineering, and trading to advance sustainable societies worldwide.

## Engineering Business

- JFE Engineering Corporation
- Head Offices: Chiyoda-ku, Tokyo and Yokohama, Kanagawa Prefecture
- Sales Revenue (consolidated): 485.8 billion yen
- Segment Profit (consolidated): 20.1 billion yen
- Employees (consolidated): 9,569



### Innovative Technologies for Energy and the Environment

JFE Engineering's core businesses in urban infrastructure and energy are underpinned by advanced technologies for resource conservation and clean energy. JFE Engineering develops infrastructure by leveraging its specialized expertise in industrial machinery and steel structures such as bridges.

## Trading Business

- JFE Shoji Trade Corporation
- Head Office: Chiyoda-ku, Tokyo
- Sales Revenue (consolidated): 1,125.8 billion yen
- Segment Profit (consolidated): 35.7 billion yen
- Employees (consolidated): 7,498



### Creating Value as a Core Trading Company of the JFE Group

JFE Shoji Trade engages in trading in Japan and the import/export of steel materials as well as steel raw materials, non-ferrous metals, chemicals, fuels, materials and machinery, and marine vessels. The company also operates businesses in the food and electronics fields.

### Examples of Contributions to Sustainability

- E-1** Use of renewable energies
- E-2** Expansion of waste recycling
- E-3** Construction of waste-to-energy plants and infrastructure
- E-4** Protection of marine ecosystems

### Examples of Contributions to Sustainability

- T-1** Products that reduce both environmental impact and energy consumption
- T-2** Energy-saving transport solutions
- T-3** Resource recycling on a global scale

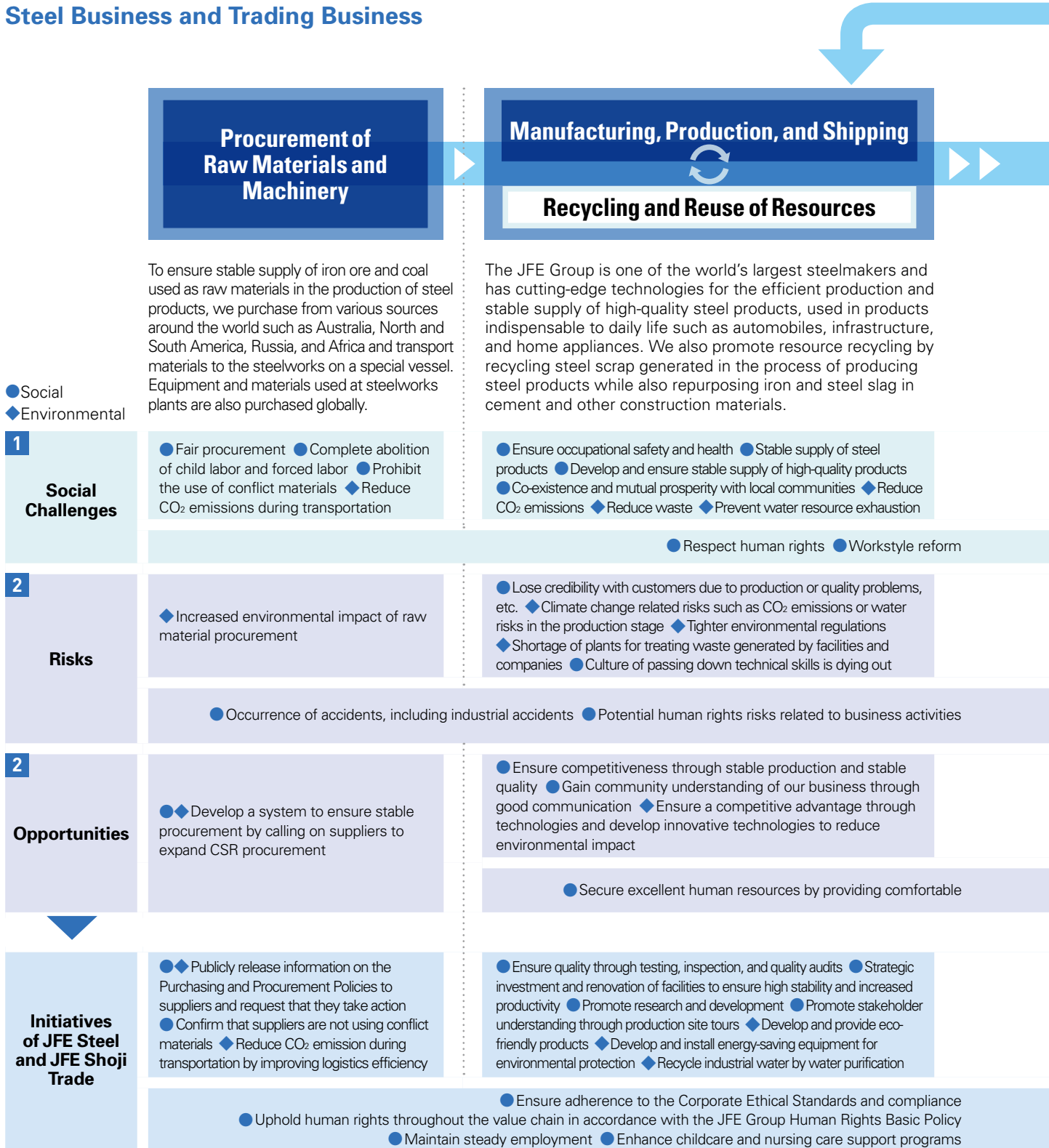


# JFE Group Value Chain

The JFE Group's value chain encompasses upstream and downstream activities across the globe. In conducting business, we seek to accurately identify and steadily respond to **1** the social challenges that the Group needs to address, and **2** the risks and opportunities that the Group must resolve through its business operations.

We will continue to implement further countermeasures throughout our value chain and strengthen the sustainability of the entire Group.

## Steel Business and Trading Business



Note: Climate change-related risks and opportunities in line with TCFD recommendations and the JFE Group's responses are introduced in "JFE's Climate Change Initiatives" (pages 25-32).



## Recycle

### Sales and Usage

The JFE Group is committed to developing eco-friendly products such as high tensile strength steel sheets that help reduce the weight of automobiles as well as electromagnetic steel plates used in electric vehicles. We support the frontier of production by responding to the diverse needs of different industries through research and development and by improving production technologies.

- Compete fairly
- ◆ Reduce CO<sub>2</sub> emissions during product transportation
- ◆ Reduce CO<sub>2</sub> emissions during product use

- Ensure information security

- Legal risks such as violations of antitrust law or competition law
- ◆ Increased environmental impact during product use

- Labor risks pertaining to workstyles
- Labor shortage
- Cyber security risks

- ◆ Contribute to reduced CO<sub>2</sub> emissions by providing high-performance steel such as high tensile strength steel sheets and electromagnetic steel plates

workplaces, boosting motivation, and reinforcing competitiveness

- Conduct compliance training on antitrust law, prohibition of bribery, etc.
- ◆ Actively promote a shift in transportation modes
- ◆ Reduce CO<sub>2</sub> emissions during product use by reducing the weight of steel, realized as a result of increasing steel strength

- Carry out initiatives to maintain and enhance the health of employees and their families
- Implement safety initiatives in collaboration with business associates
- Actively hire and develop diverse human resources including women and foreign nationals
- ◆ Enhance labor saving and increase productivity by utilizing AI and IoT

### Collecting Steel Scrap

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

- ◆ Prevent resource depletion
- ◆ Increase the volume of scrap generated

- ◆ Decline in the grade of scrap

- ◆ Increased use of scrap
- ◆ Expand the scrap distribution business

- ◆ Efficient transportation for collecting steel scrap
- ◆ Efficient use of resources by increasing steel production using scrap

# JFE Group Value Chain

## Engineering Business



- Social
- ◆ Environmental

1

### Social Challenges

- Maintenance of social infrastructures, aging of facilities
- Disaster prevention and mitigation, national resilience
- ◆ Reduce energy and CO<sub>2</sub> emissions during operations
- ◆ Resource restriction

- Fair procurement

- Respect human rights
- Workstyle reform

2

### Risks

- Lose credibility with customers due to problems with product operation or quality, etc.
- ◆ Tighter environmental regulations

- ◆ Increased environmental impact of raw material procurement

- Potential human rights risks relating to business activities
- Labor risks pertaining to workstyles

2

### Opportunities

- Expand ESG investment
- ◆ Implement requested functions
- Need for cost reduction and energy saving
- ◆ More sophisticated needs in the energy-environment area
- ◆ Increased need for renewable energy solutions
- ◆ Increased response to climate change related disasters (disaster prevention and mitigation, disaster waste processing)

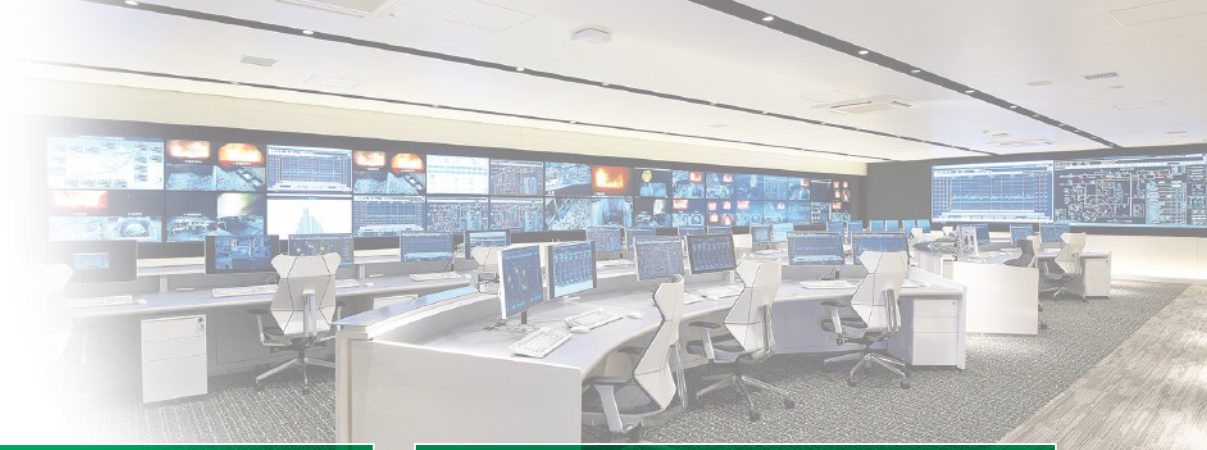
- ◆ Develop a system to ensure stable procurement by calling on suppliers to expand CSR procurement

### Initiatives of JFE Engineering

- Deliver solutions that meet customer needs
- Secure competitiveness by creating a new business model that contributes to addressing social problems
- Use big data and AI in design
- ◆ Promote research and development (especially solutions for reducing environmental impact such as energy-saving and resource-saving technologies)
- ◆ Design products that meet quality requirements, regulations, cost reduction, and energy-saving requirements
- ◆ Plan for construction and operation of a power plant that utilizes renewable energy as well as the sales of electricity

- ◆ Making public the procurement policy and requesting the commitment of suppliers
- ◆ Requesting suppliers to take action in CSR initiatives
- ◆ Promote green procurement

- Uphold human rights throughout the value chain in accordance with the JFE Group Human Rights Basic Policy
- Establish a business continuity plan
- Promote workstyle reform and the work-life balance
- Use data collected from customer surveys to enhance customer satisfaction



## Production/Construction

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

### Maintenance

### Operation



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

- Ensure product quality
- ◆ Preserve living environments
- ◆ Issues regarding waste reduction

- Improve productivity
- Disaster prevention and mitigation
- ◆ Reduce CO<sub>2</sub> emissions
- ◆ Issues regarding waste treatment

- Occupational safety and health

- Ensure information security

- ◆ Pollution of the environment, environmental accidents
- ◆ Effects of meteorological disasters

- Cyber attack risks such as malware
- ◆ Environmental accidents during operations or maintenance
- ◆ Meteorological disasters affecting operations

- Culture of passing down technical skills is dying out
- Occurrence of accidents, including industrial accidents
- ◆ Violation of environmental regulations and laws

- Labor shortage
- Cyber security risks

- Saving labor through new technology

- Expand the business scale through privatization of public services
- Need for remote monitoring and automation due to labor shortage and shortage of skilled technicians
- ◆ Need for improving operational efficiency and reducing environmental impact

- Introduce a labor-saving construction method
- ◆ Promote waste recycling

- Use AI and IoT to develop technologies for remote monitoring and automation of operations as well as to prevent mechanical breakdowns
- ◆ Optimize operations by analyzing incinerator combustion conditions, reduce environmental impact

- Prevent industrial accidents by introducing a labor safety management system
- ◆ Environmental management, energy saving activities, and legal compliance by each construction site and company
- ◆ Co-existence with the local community

- Implement safety initiatives in collaboration with business associates
- Hire and develop diverse human resources, including women and foreign nationals
- Develop and educate human resources
- ◆ Improve environmental performance by introducing an environmental management system

# Value of Steel

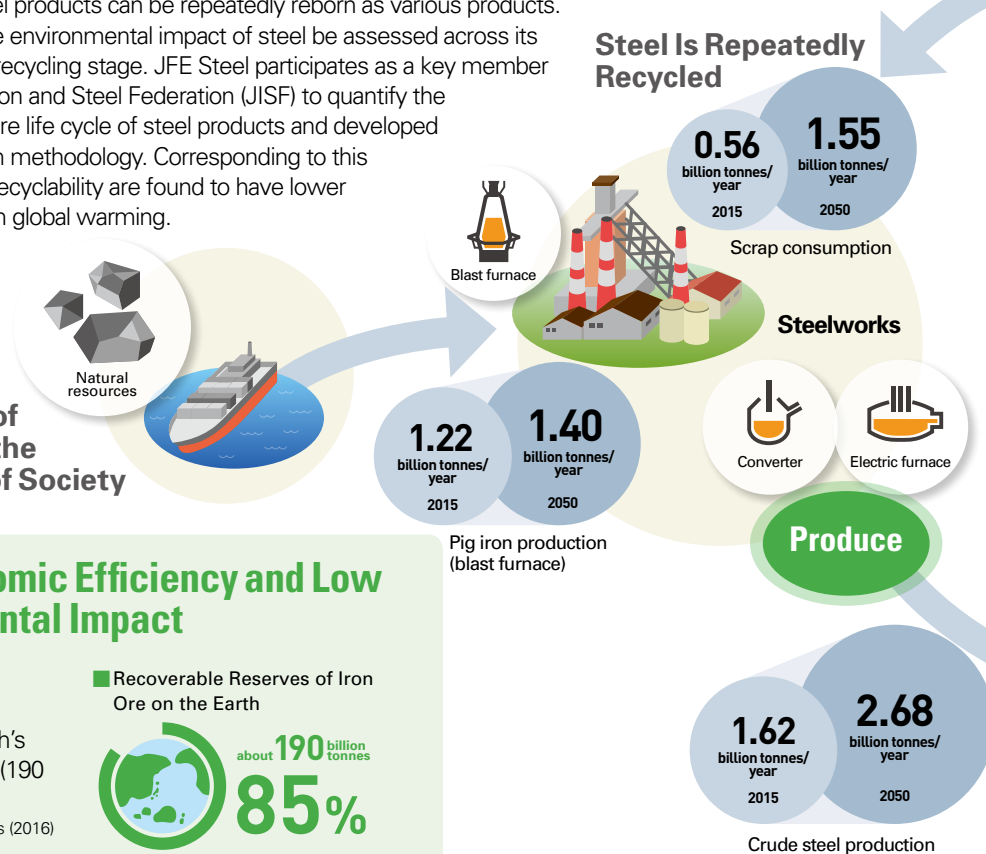
Iron makes up approximately 30% of the Earth's mass. Because of its rich reserves, steel can be mass produced at very low cost. Compared to other materials, the environmental impact of its production is extremely low and it has excellent recyclability. Steel can be recycled repeatedly and reborn as various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

## Life Cycle Assessment of Steel

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

\*ISO 20915: Life cycle inventory calculation methodology for steel products (2018.11)  
JIS Q 20915: Life cycle inventory calculation methodology for steel products (2019.6)

**Rich Reserves of Steel Support the Development of Society**



### Produce

## High Economic Efficiency and Low Environmental Impact

### Earth, a Planet of Iron (Abundant Resources)

As much as 85% of the Earth's metal resources are iron ore (190 billion tonnes).

Source: Mineral Commodity Summaries (2016)

### Recoverable Reserves of Iron Ore on the Earth



### Mass Production at Low Cost

Iron is a material with rich reserves and a long history of development. It can be mass produced at reasonable price and supplied stably, thereby contribute to the sustainable growth of society.



Created by JFE Holdings with documents from Mizuho Bank Industry Research Division and economic forecasts by Fuji Keizai Co., Ltd.

Research: JFE Holdings  
\*Cost of producing one unite weight of iron is indexed at 1 for comparison with other materials.

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

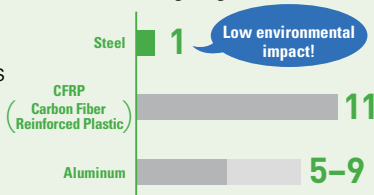
Greenhouse gas (GHG) emissions of steel at the manufacturing stage\*<sup>1</sup> is 1/5 to 1/9 of that of aluminum and approximately 1/11 of that of carbon fiber.

Source: Steel Recycling Institute

\*<sup>1</sup> From mining raw materials to factory shipment.

\*<sup>2</sup> Comparison with other materials' GHG emissions per unit weight, with steel as 1.

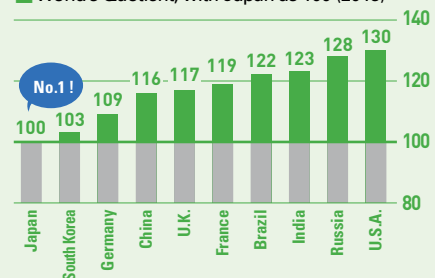
### GHG Emissions at the Manufacturing Stage\*<sup>2</sup>



### Japan's Steel Industry Keeps the Top Energy Efficiency in the World

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

### World's Quotient, with Japan as 100 (2015)



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

## Recycle

**Steel Is Efficiently Recovered and Separated Using Magnets**



Disassemble and collect

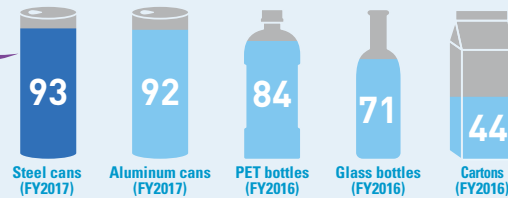
**Closed-loop recycling!**

## Recycle

### Excellent Recyclability

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

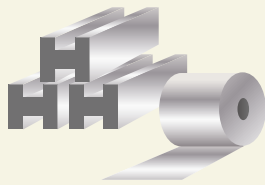
■ Recycling Rate by Material (%)



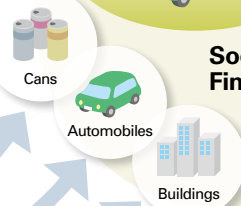
Source: Japan Steel Can Recycling Association

## Steel Is Repeatedly Reborn as Various Products

**Processing and producing different products**  
Automobiles and construction materials



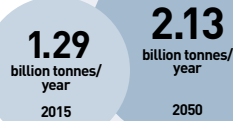
**Use**



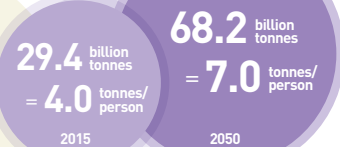
**Society Final product/use**

**Steel Is Reborn as Various Products**

**Contributing to the Sustainable Development of Daily Life and the Economy with the World's Top Energy-saving, Environmental Technologies**

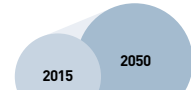


Steel demand



Steel stock volume

World Steel Use



The long-term vision for climate change mitigation by JISF

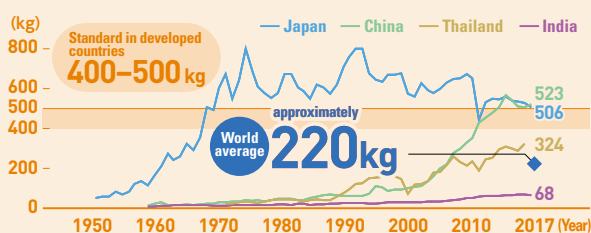
## Use

### Foundation of Daily Life and Society

#### The Potential to Grow on a Global Scale

Global average of annual consumption of steel is approximately 220 kg per capita. The long-term global demand for steel is expected to keep growing alongside the economic development of emerging countries.

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

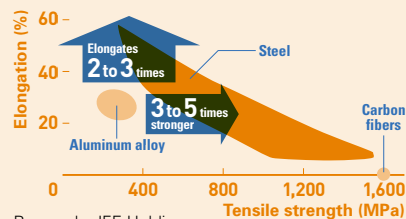


Source: World Steel Association

#### Potential for Evolution

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

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



Research: JFE Holdings

# Material CSR Issues of the JFE Group

In FY2016, the JFE Group identified material CSR issues that strongly impact where and how the company should invest its resources, making every effort to minimize negative societal impact and maximize the societal value as only the JFE Group can. In FY2017, the Group then set key performance indicators (KPIs).

Initiatives for addressing material CSR issues demonstrate the Group’s vision of “Contributing to society with the world’s most innovative technology” and will contribute to its sustainable growth as well as the sustainability of society.

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

Areas of Focus		Details	Scope of Influence	Material CSR Issues
Activity	Provide quality products (customer satisfaction)	<ul style="list-style-type: none"> <li>Provide products and services based on advanced technologies</li> <li>- Continue stable supply of safe, high-quality products</li> <li>- Solve customer problems</li> </ul>	JFE Group Customers Society	<b>Stably supply products</b> <b>Ensure quality</b> <b>Pursue research and development</b> <b>Respond to customer needs</b>
	Protect the global environment	<ul style="list-style-type: none"> <li>Mitigate environmental impact</li> <li>Contribute to the creation of a recycling-oriented society</li> <li>Utilize Group technologies to develop products that contribute to environmental protection</li> </ul>	JFE Group Local communities near manufacturing sites Customers Society	<b>Develop and provide eco-friendly products</b> <b>Mitigate climate change</b> <b>Protect the global atmosphere</b> <b>Pursue resource recycling</b>
	Ensure occupational safety and health	<ul style="list-style-type: none"> <li>Prioritize safety first</li> <li>Maintain the physical and mental health of employees and their families and create rewarding workplaces</li> </ul>	JFE Group Suppliers Business partners	<b>Prevent workplace accidents</b> <b>Ensure the health of employees and their families</b>
	Recruit and nurture diverse human resources	<ul style="list-style-type: none"> <li>Maintain work environments where all personnel can maximize their abilities</li> <li>Accumulate and hand down technologies and skills</li> </ul>	JFE Group Business associates	<b>Pursue diversity and inclusion</b> <b>Strengthen human resources development</b>
Basis of activity	Thoroughly enforce compliance		JFE Group Suppliers Political authorities Society	<b>Ensure adherence to corporate ethical standards and compliance</b>

**Corporate Governance (Ensure Fairness, Objectivity and Transparency)**

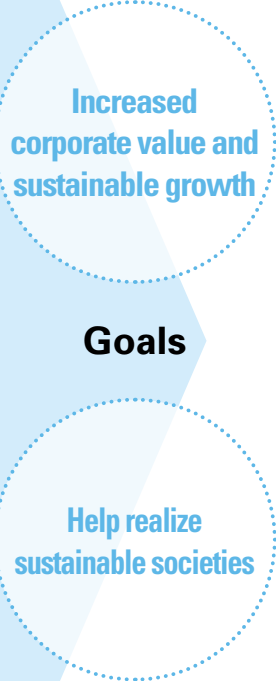
**Respect and Maintain Awareness of Human Rights**

## Contributing to the Sustainable Development Goals (SDGs)

In September 2015, a UN Summit adopted 17 SDGs to be addressed through worldwide efforts to achieve sustainable development. The JFE Group is responding to this call through contributions achieved by its business activities.



	Relevant SDGs
	7 9 10 11
	12 13 17
	6 7 9 12
	13 14
	3 8
	4 5 8 9
	10
	10 16



## Identifying Material CSR Issues in FY2016

### STEP 1 Identification

By measuring the businesses of the JFE Group against the following yardsticks, we identified 35 core issues for our CSR initiatives:

- GRI G4 Sustainability Reporting Guidelines
- ISO 26000
- Sustainability Development Goals (SDGs)
- ESG survey via external assessment
- Internal documents on employee satisfaction surveys, etc.
- Benchmark surveys conducted to the three business

### STEP 2 Prioritization (Group-wide Meeting)

We prioritized the issues using a matrix comprised of two axes, stakeholder expectations and relevance to business (societal impact), and identified 13 issues in five focus areas:

**Conduct a Group-wide Meeting**  
Managers from each operating company discussed the prioritization of the 35 core issues from the perspectives of group management and their respective operating companies' interests.

### STEP 3 Validation

Material CSR issues identified were validated by following process:

- Confirmation and examination by each operating company
  - Examination and approval by the JFE Group CSR Council\*
- \*Participants included the president of JFE Holdings (chairperson), executive vice president, corporate officers, full-time Audit & Supervisory Board members, the presidents of operating companies, etc.

## Setting KPIs in FY2017

### STEP 4 Review and Setting KPIs

- Review**
- Reviewed by the JFE Group CSR Council
  - Examined comments by third-party experts on the CSR report

- Setting KPIs**
- KPIs were set using the following process, and PDCA cycles are being implemented.
- Review at each operating company
  - Submit draft KPIs to the JFE Group Environmental Committee for deliberation
  - Examination and approval by the JFE Group CSR Council

## KPIs for Material CSR Issues

Results for FY2018 and Revision to be Applied on and after FY2019

The JFE Group has established KPIs to address the CSR issues identified in FY2016. The Group tackles these KPIs by focusing the power of the entire Group. Considering the initiatives and results achieved in FY2018, we partially reviewed the KPIs to be applied from FY2019 forward. The Group will efficiently implement PDCA cycles and promote effective CSR management by setting KPIs that take into consideration the business characteristics of each operating company.

Areas of Focus		Material CSR Issues	Operating Company	KPIs
Activity	Provide quality products (customer satisfaction)	Stably supply products	S	• Make steady progress on strengthening its manufacturing base to ensure stable supply
			E	• Secure a stable number of certificated managing engineers
			T	• Make consistent investment in processing and distribution operations
		Ensure quality	S	• Improve the level of quality assurance and product testing
			E	• No major quality problems
			T	• Conduct quality audits on group companies
		Pursue research and development	S	• Make consistent or increased investment in research and development
			E	• Make consistent or increased investment in research and development
			Respond to customer needs	S
	E	• Use data collected from customer surveys to enhance customer satisfaction		
	T	• Invest in the development of strong sales personnel		
	Protect the global environment	Develop and provide eco-friendly products	S	• Expand the eco-friendly products and technological offerings
Mitigate climate change		S	(1) CO <sub>2</sub> reduction target defined in the Japan Iron and Steel Federation's (JISF) "Commitment to a Low Carbon Society" (2) Continue to invest in energy conservation	



○ : Target achieved   △ : Target partially achieved   × : Target not achieved

	Initiatives and Results for FY2018	Assessment	KPIs for FY2019	Relevant Pages
	<ul style="list-style-type: none"> <li>Maintaining stable supply was not fully achieved due to equipment problems; steady progress was made, however, to capital investments for maintaining the manufacturing infrastructure centered on the upstream processes</li> </ul>	△	(1) Maintain stable operations to ensure stable product supply (2) Make steady progress on strengthening the manufacturing base, including measures to stabilize blast furnace operation	59
	<ul style="list-style-type: none"> <li>We managed to secure a stable number of managing engineers while achieving the highest sales revenue in FY2018</li> </ul>	○	<ul style="list-style-type: none"> <li>Secure a stable number of certificated managing engineers</li> </ul>	60
	<b>Details of Investments</b> <ul style="list-style-type: none"> <li>Reinforcement: 8.2 billion yen</li> <li>Renovation and security: 3.5 billion yen</li> <li>System: 3.1 billion yen</li> </ul>	○	<ul style="list-style-type: none"> <li>Make consistent investment in processing and distribution operations</li> </ul>	60
	<ul style="list-style-type: none"> <li>Capital investments to improve the level of quality assurance and product testing are proceeding as planned</li> </ul>	○	<ul style="list-style-type: none"> <li>Make steady progress on capital investments to improve the level of quality assurance and product testing in line with the Sixth Medium-term Business Plan</li> </ul>	59
	<ul style="list-style-type: none"> <li>No major quality problems</li> </ul>	○	<ul style="list-style-type: none"> <li>No major quality problems</li> </ul>	59
	<ul style="list-style-type: none"> <li>Quality audits were conducted at least once a year for the 30 group companies in Japan and overseas that engage in manufacturing</li> <li>Audit performance rate: 100% (16 companies in Japan, 14 overseas)</li> </ul>	○	<ul style="list-style-type: none"> <li>Continue conducting quality audits at least once a year for the 30 group companies in Japan and overseas that engage in manufacturing (maintain 100% audit performance rate)</li> </ul>	59
	<ul style="list-style-type: none"> <li>12% increase in research and development spending compared to FY2017</li> </ul>	○	<ul style="list-style-type: none"> <li>Make steady progress in research and development as set out in the Sixth Medium-term Business Plan</li> </ul>	61
	<ul style="list-style-type: none"> <li>Investment was maintained/increased FY2017: 3.8 billion yen* FY2018: 4.1 billion yen* (8% increase from FY2017)</li> </ul>	○	<ul style="list-style-type: none"> <li>Make consistent or increased investment in research and development</li> </ul>	61
	<b>Building Internal Infrastructure</b> <ul style="list-style-type: none"> <li>Promoted the implementation of a system to support approaches to and from customers</li> <li>Implemented a mobile viewing system for inventory and work-in-progress data</li> </ul> <b>Developing Sales Personnel</b> <ul style="list-style-type: none"> <li>Held rank-based training (newly appointed, mid-rank, manager, and office heads) within the sales department; additional training on QA was held in FY2018</li> </ul>	○	(1) All sales personnel are to take rank-based training for the sales department within two years of being posted to the department (2) Conduct a CS survey and ensure feedback of results	60
	<ul style="list-style-type: none"> <li>Feedback was provided using construction evaluation forms for public works and quality management system customer surveys for private work</li> </ul>	○	<ul style="list-style-type: none"> <li>Use data collected from customer surveys to enhance customer satisfaction</li> </ul>	61
	<ul style="list-style-type: none"> <li>Fully achieved the target of human resource development through skill training and the participation of overseas employees in joint training in Japan</li> </ul>	○	<ul style="list-style-type: none"> <li>All target employees are required to meet the goal of human resource development through skill training and participation of overseas employees in joint training held in Japan</li> </ul>	61
	<ul style="list-style-type: none"> <li>Developed EXPAL, a steel plate with extended painted life and topology optimization (reducing the weight of the part) technology</li> </ul>	○	<ul style="list-style-type: none"> <li>Make steady progress in developing new products and technologies, as set out in the Sixth Medium-term Business Plan</li> </ul>	45, 52, 54–55
	(1) Continuing to work to achieve the CO <sub>2</sub> reduction target defined in the JISF's "Commitment to a Low Carbon Society" (2) Made steady progress in energy conservation investment	○	(1) CO <sub>2</sub> reduction target defined in the JISF's "Commitment to a Low Carbon Society" (2) Continue to invest in energy conservation	41–42

\*Amount invested in research and development for the fiscal year

## Material CSR Issues of the JFE Group

Areas of Focus		Material CSR Issues	Operating Company	KPIs
Activity	Protect the global environment	Develop and provide eco-friendly products/ Mitigate climate change	<b>E</b>	<ul style="list-style-type: none"> <li>Contribute to climate change mitigation through our products and services</li> </ul>
		Protect the global atmosphere	<b>S</b>	(1) Continue to work on keeping NOx and SOx emissions at low levels (2) VOC emissions: maintain a low level (30% decrease compared to FY2000) (3) Benzene emissions: maintain a low level (80% decrease compared to FY1999) (4) Dichloromethane emissions: maintain a low level (40% decrease compared to FY1999) Note: Items (2) to (4) were added after the term began to reinforce the KPI.
			<b>E</b>	—
		Pursue resource recycling	<b>S</b>	(1) Maintain the efficient use of water Recirculated water usage rate: 90% or more (2) Recycling rate of co-products: 99% or more Note: Numerical target for items (1) and (2) was added after the term began to reinforce the KPI.
			<b>E</b>	<ul style="list-style-type: none"> <li>Recycle at least 99.5% of rubble</li> <li>Recycle at least 95.0% of sludge</li> <li>Recycle at least 85.0% of industrial waste</li> </ul>
			<b>T</b>	<ul style="list-style-type: none"> <li>Global recycling of steel scraps</li> </ul>
	Ensure occupational safety and health	Prevent workplace accidents	All Group	<ul style="list-style-type: none"> <li>Workplace fatalities: zero occurrences</li> </ul>
		Ensure the health of employees and their families	All Group	<ul style="list-style-type: none"> <li>Provision rates of health guidance (by 2020)  <b>S</b> 35% <b>E</b> 35% <b>T</b> 40%</li> </ul>
				<ul style="list-style-type: none"> <li>Rate of health examination for spouses: 60% (by 2020)</li> </ul>
	Recruit and nurture diverse human resources	Pursue diversity and inclusion	All Group	<ul style="list-style-type: none"> <li>Ratios for female recruits  <b>S</b> Career-track white-collar position: 35% or more            Career-track technical position: 10% or more            On-site position: 10% or more  <b>E</b> Career-track white-collar position: 20% or more            Production/construction position (technical): 5% or more  <b>T</b> Career-track white-collar position: 25% or more</li> </ul>
<ul style="list-style-type: none"> <li>Females in managerial positions: triple the 2014 August figure by 2020</li> </ul>				
Strengthen human resources development		All Group	<ul style="list-style-type: none"> <li>Improve technical skills and conduct high-quality training programs</li> <li>100% attendance from the target audience for human rights awareness training</li> </ul>	
Basis of activity	Thoroughly enforce compliance	Ensure adherence to corporate ethical standards and compliance	All Group	<ul style="list-style-type: none"> <li>Steady execution of training to foster and maintain a sense of compliance</li> <li>Improve employee awareness of ethics reflected in the Corporate Ethics Awareness Survey</li> </ul>

○ : Target achieved △ : Target partially achieved × : Target not achieved

	Initiatives and Results for FY2018	Assessment	KPIs for FY2019	Relevant Pages
	<ul style="list-style-type: none"> <li>CO<sub>2</sub> reduction achieved through our renewable energy power generation plants sold 4.12 million t-CO<sub>2</sub>/year</li> </ul>	○	(1) Contribute to climate change mitigation through our products and services <ul style="list-style-type: none"> <li>Promote waste-fueled power generation</li> <li>Promote biomass power generation</li> <li>Reduce energy use at water and sewage treatment plants</li> <li>Promote geothermal, solar photovoltaic, and wind power generation</li> <li>Promote sewage sludge power generation</li> <li>Distribute renewable energy-generated power</li> </ul> (2) Reduce the carbon footprint of factories and offices	46–47
	(1) Continue to maintain low emissions of NO <sub>x</sub> and SO <sub>x</sub> through thorough combustion management (2) VOC emissions: 51% decrease (3) Benzene emissions: 93% decrease (4) Dichloromethane emissions: 68% decrease	○	(1) Continue to work on keeping NO <sub>x</sub> and SO <sub>x</sub> emissions at low levels (2) VOC emissions: maintain a low level (30% decrease compared to FY2000) (3) Benzene emissions: maintain a low level (80% decrease compared to FY1999) (4) Dichloromethane emissions: maintain a low level (40% decrease compared to FY1999)	48–49
	—	—	<ul style="list-style-type: none"> <li>Continue to work on keeping NO<sub>x</sub> and SO<sub>x</sub> emissions at low levels</li> </ul>	48
	(1) Recirculated water usage rate: 93.5% (2) Recycling rate of co-products: 99.7%	○	(1) Maintain the efficient use of water Recirculated water usage rate: 90% or more (2) Recycling rate of co-products: 99% or more	53–54
	<ul style="list-style-type: none"> <li>Recycled 99.6% of rubble</li> <li>Recycled 98.8% of sludge</li> <li>Recycled 91.0% of industrial waste</li> </ul>	○	(1) Recycle at least 99.5% of rubble <ul style="list-style-type: none"> <li>Recycle at least 95.0% of sludge</li> <li>Recycle at least 85.0% of industrial waste</li> </ul> (2) Recycle at least 98% of recyclable wastes generated at the Yokohama head office (3) Promote recycling business (plastics, foods, home appliances, fluorescent lamps, etc.)	53–54
	<ul style="list-style-type: none"> <li>Carried out scrap transaction exceeding the volume for FY2017 (+1.4%)</li> <li>In addition to exports from Japan there was an increase in transactions between non-Japanese countries such as ASEAN nations in small lots using containers</li> </ul>	○	<ul style="list-style-type: none"> <li>Increase scrap transaction to exceed the volume for FY2017 (FY2020 target: +3% from FY2017)</li> </ul>	55
	<ul style="list-style-type: none"> <li>Number of workplace fatalities: 2</li> <li>Implemented an internal audit system</li> <li>Installed security monitors</li> </ul>	×	<ul style="list-style-type: none"> <li>Workplace fatalities: zero occurrences</li> </ul>	72–73
	<ul style="list-style-type: none"> <li>Provision rates of health guidance  <span style="color:red">■</span> 56.9% <span style="color:green">■</span> 22.1% <span style="color:orange">■</span> 45.2%</li> <li>Used a specialized organization for health guidance</li> <li>Encouraged employees who had not received health guidance to do so</li> </ul>	△	<ul style="list-style-type: none"> <li>Provision rates of health guidance (by 2020)  <span style="color:red">■</span> 35% <span style="color:green">■</span> 35% <span style="color:orange">■</span> 40%</li> </ul>	73–74
	<ul style="list-style-type: none"> <li>Rate of health examination for spouses  <span style="color:red">■</span> 52.3% <span style="color:green">■</span> 54.2% <span style="color:orange">■</span> 52.4%</li> <li>Made announcements internally and from health insurance association</li> </ul>	×	<ul style="list-style-type: none"> <li>Rate of health examination for spouses: 60% (by 2020)</li> </ul>	73–74
	<ul style="list-style-type: none"> <li>Ratios for female recruits  <span style="color:red">■</span> Career-track white-collar position: 43%            Career-track technical position: 12%            On-site position: 12%  <span style="color:green">■</span> Career-track white-collar position: 22%            Production/construction position (technical): 20%  <span style="color:orange">■</span> Career-track white-collar position: 28%</li> <li>Created a booklet and a recruiting page on the corporate website for female white-collar positions</li> </ul>	○	<ul style="list-style-type: none"> <li>Ratios for female recruits  <span style="color:red">■</span> Career-track white-collar position: 35% or more            Career-track technical position: 10% or more            On-site position: 10% or more  <span style="color:green">■</span> Career-track white-collar position: 20% or more            Production/construction position (technical): 5% or more  <span style="color:orange">■</span> Career-track white-collar position: 25% or more</li> </ul>	70
	<ul style="list-style-type: none"> <li>Actual number of females in managerial positions: 3.3 times the 2014 August figure</li> </ul>	○	<ul style="list-style-type: none"> <li>Females in managerial positions: five times the 2014 August figure by 2025</li> </ul>	69
	<ul style="list-style-type: none"> <li>Developed human resources through various training programs</li> </ul>	○	<ul style="list-style-type: none"> <li>Improve technical skills and conduct high-quality training programs</li> </ul>	71
	<ul style="list-style-type: none"> <li>Conducted rank-based training</li> </ul>	○	<ul style="list-style-type: none"> <li>100% attendance from the target audience for human rights awareness training</li> </ul>	71
	<ul style="list-style-type: none"> <li>Conducted rank-based compliance training</li> </ul>	○	<ul style="list-style-type: none"> <li>Steady execution of training to foster and maintain a sense of compliance (100% achievement)</li> </ul>	19
	<ul style="list-style-type: none"> <li>Addressed issues identified in the previous survey including:            (1) Establish an external hotline, revise regulations regarding whistleblowing            (2) Promote workstyle reform (remote working, encouraging employees to take paid leaves, etc.)</li> </ul>	—*	<ul style="list-style-type: none"> <li>Improve employee awareness of ethics reflected in the Corporate Ethics Awareness Survey</li> <li>Conduct the Corporate Ethics Awareness Survey for all employees</li> </ul>	—

\*Next awareness survey is planned for FY2019.

# CSR Management

## Corporate Governance System Outline

### Governance System

JFE Holdings and each operating company have their respective Audit & Supervisory Board members. The companies are crosschecked by the Board of Directors, which supervises operational execution, and the Audit & Supervisory Board members, which conducts audits. Also, a corporate officer system separates decision making and execution to clarify authority and responsibility as well as to accelerate execution.

JFE Holdings' Board of Directors is responsible for maintaining and enhancing management efficiency and passing resolutions as legally required, laying down key management policies and strategies and supervising operational execution. The Audit & Supervisory Board oversees management for the purpose of strengthening its soundness.

For more details regarding our corporate governance, please refer to the JFE GROUP REPORT (Integrated Report).

## JFE CSR System

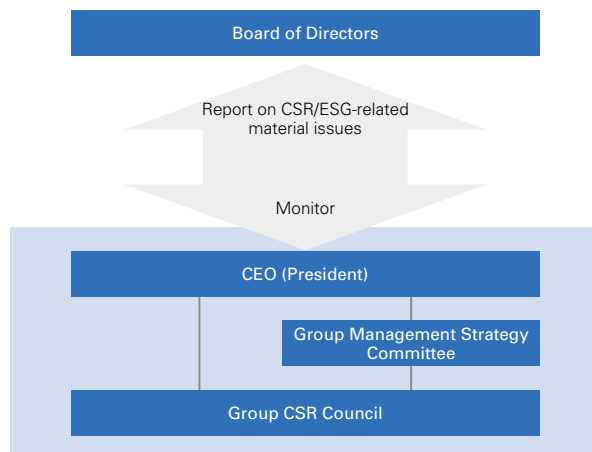
The JFE Group considers corporate social responsibility (CSR) to be the foundation of its business as it contributes to the realization of a better society. The JFE Group CSR Council is chaired by the company president and convenes quarterly. Through its Group-wide internal units, comprising the JFE Group Compliance Committee, JFE Group Environmental Committee and JFE Group Internal Control Committee, the council discusses each activity. Furthermore it monitors, guides and supervises the wide range of JFE Group CSR activities such as compliance, the environment, climate change, human resources, safety, disaster prevention, social contribution, regulations for addressing antisocial forces, and ESG-related risk. The Group Management Strategy Committee also deliberates important CSR activities of the company.

The Board of Directors monitors the Group's CSR activities by receiving reports on material issues and engaging in discussions about them.

### Topics Discussed at the Board Meeting

- Set key performance indicators (KPIs) for material CSR issues and the status of each initiative
- Climate change initiatives
- Employee ethics awareness survey results
- Operational status of the whistleblowing system
- Publishing the CSR report and integrated report

### Monitoring by the Board of Directors



## Compliance

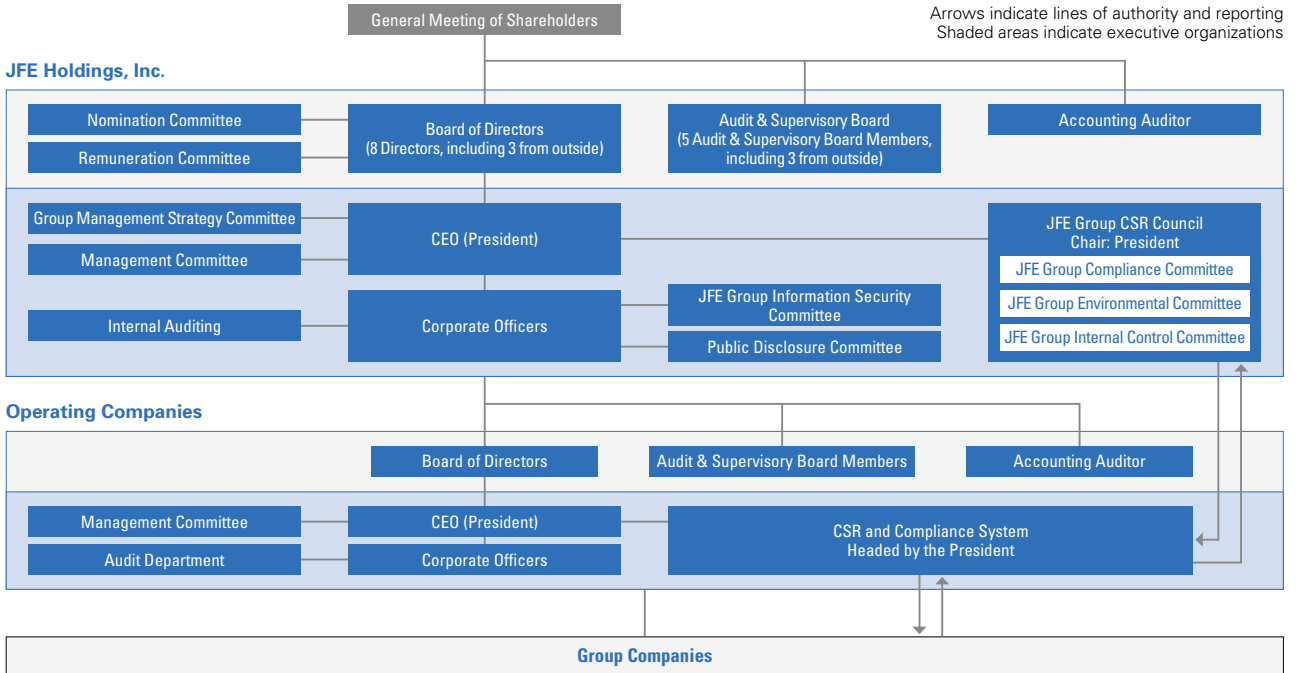
The JFE Group believes that ensuring thorough compliance is the foundation for creating and maintaining relationships of trust with all stakeholders, including its customers, shareholders, and local communities. Misconduct and scandals resulting from compliance violations can instantly shatter the trust that has taken many years to establish.

Of extreme importance to the Group is that all of its members deepen their knowledge and awareness of compliance and perform their jobs accordingly. It conducts training on various topics such as antimonopoly law and laws prohibiting bribery of public officials via e-learning, guidebooks, guidebook reading sessions, and other means.

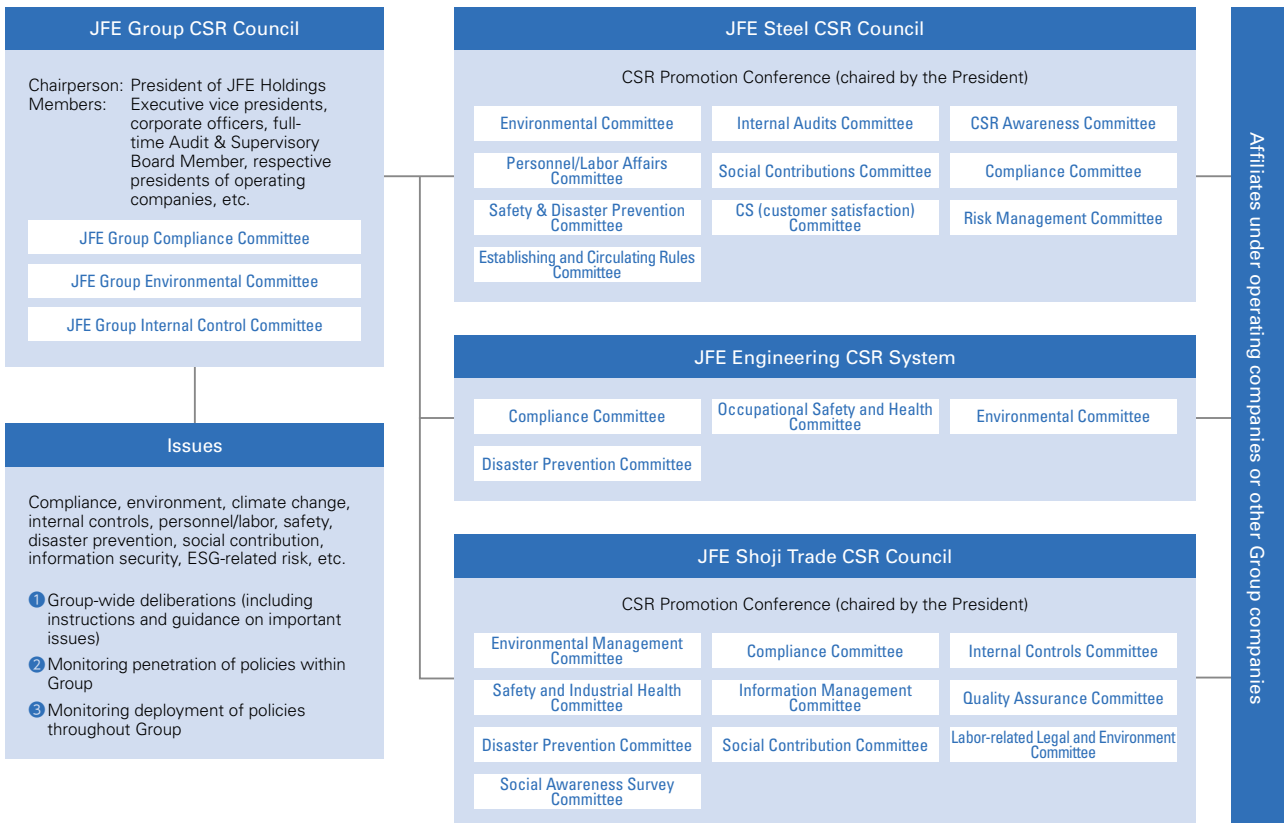
### Development of the Whistleblowing System

JFE's whistleblowing system helps to ensure that important compliance-related information, including Antitrust violation, bribery, or all kinds of workplace harassment, can be communicated from the frontlines to top management rapidly and accurately. A Corporate Ethics Hotline has been established in every operating company to maintain corporate ethics, comply with laws and regulations, and prevent corruption. In addition, an external hotline to a law firm is also provided to assure anonymity of internal whistleblowing system. We are promoting the use of the whistleblowing system through posters and have implemented regulations for ensuring confidentiality

■ Corporate Governance System (as of June 21, 2019)



■ CSR Structure

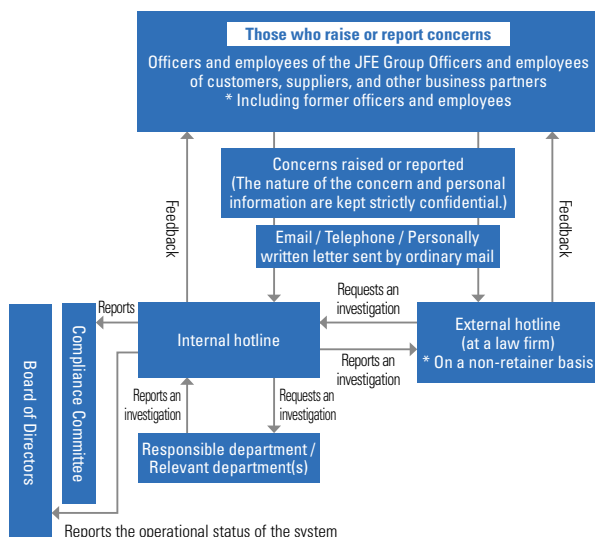


and protecting whistleblower. Furthermore, matters are regularly reported to the full-time Audit & Supervisory Board Members, and the operational status of the system is reviewed by the Board of Directors.

■ Number of Cases Reported to the Corporate Ethics Hotline

Company	FY2016	FY2017	FY2018
JFE Holdings and operating companies	62	89	80

■ Whistleblowing System



● Preventing Bribery

JFE does not tolerate any kind of illegal activity in Japan or any other country, including bribery, such as offering money or other benefits to public officials, and never resorts to these illegal activities to gain profit or resolve problems. Based on these thoughts, JFE established JFE Group's Basic Policy on Preventing Bribery of Public Officials and disseminate it throughout the JFE Group companies and also develops systems to avoid bribery of public officials.

**Web** JFE Group's Basic Policy on Preventing Bribery of Public Officials → <https://www.jfe-holdings.co.jp/en/company/philosophy/anti-bribery.html>

## Risk Management

JFE Holdings is responsible for comprehensive risk management in accordance with its Basic Policy for Building Internal Control Systems. The JFE Group CSR Council, which is independent of the Audit &

Supervisory Board and chaired by the President of JFE Holdings, collects specific information for the purpose of reducing the frequency and impact of risks. The executive officer responsible for risk works to identify potential risks associated with business activities, ethical and regulatory compliance, the disclosure of financial reports and information, and ESG risks, which have become increasingly important in risk management. If potential risks are identified, they are assessed to determine if there is a need for further examination or the deployment of countermeasures.

## Internal Controls

The JFE Group's internal control system, in accordance with the Basic Policy for Building Internal Control Systems, is maintained through various committee regulations, including the Rules of the Board of Directors, Regulations for Group Management Strategy Committee, Regulations for Management Committee, Regulations for the JFE Group CSR Council, Regulations for Organization and Operations, Regulations for Document Management, Regulations for Addressing Violence Directed at Companies, and the installation of the Corporate Ethics Hotline. The Basic Policy for Building Internal Control Systems is periodically revised and improved to boost sustainable corporate value.

## Internal Audits/CSR Audits

JFE Holdings, its operating companies, and key Group companies have established internal audit organizations, comprising 159 people as of April 1, 2019. The organizations conduct operational audits of each operating company and also share information to improve overall auditing within the Group.

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

## Respect for Human Rights

### ● JFE Group Human Rights Basic Policy

In response to the International Bill of Human Rights, the Universal Declaration of Human Rights, the International Covenant on Human Rights, and other international conventions, the JFE Group views respect for human rights as both a corporate social responsibility and a foundation of its business. We explicitly declared our determination in the Standards of Business Conduct to not engage in discrimination in our business activities and have upheld this policy throughout our actions. Furthermore, we established the JFE Group Human Rights Basic Policy to undertake a range of initiatives in line with the United Nations Guiding Principles on Business and Human Rights and are working to raise awareness of human rights among all employees.

**Web** [Human Rights Basic Policy →](https://www.jfe-holdings.co.jp/en/csr/society/human_rights_basic_policy/)  
[https://www.jfe-holdings.co.jp/en/csr/society/human\\_rights\\_basic\\_policy/](https://www.jfe-holdings.co.jp/en/csr/society/human_rights_basic_policy/)

### ● Promoting Human Rights

In order to steadily work on human rights initiatives, we established the JFE Group Human Rights Promotion Council, chaired by the executive officer in charge of general administration, under the JFE Group Compliance Committee, chaired by the president of JFE Holdings. This framework allows us to define Group-wide policies and share information with departments responsible for human rights issues that have been set up at each operating company. Additionally, we have set up hotlines for harassment and other human rights violations at every operating company.

#### ■ Governance Structure for Human Rights Awareness Promotion



### ● Human Rights Promoting Activities

Our initiatives include implementing human rights training courses, guaranteed employment opportunities and promotion of fair human-resource management, and preventing workplace harassment. Harassment of a sexual or power nature, or on any other basis, is prevented through measures including company regulations, training,

workplace posters and hotlines staffed by men and women at each business location. In addition, during the annual Human Rights Week, leaflets with messages from senior management are distributed and employees are encouraged to submit slogans. Furthermore, we actively support and take part in initiatives undertaken by human rights organizations, such as the Industrial Federation for Human Rights, Tokyo and the Corporate Federation for Dowa and Human Rights Issue, Osaka. By attending seminars and workshops of such organizations, we have become increasingly aware of human rights trends and challenges as well as issues specific to Japanese business. In turn we apply this knowledge in JFE human-rights-awareness training programs and related initiatives. In line with the ongoing globalization of the Group's business in recent years, these training programs now cover corporate responsibility for respecting human rights to meet the expectations of global society. In FY2019, we invited external experts to speak about business and human rights at an internal seminar so as to gain understanding of international trends. Across the JFE Group we are working to increase awareness of human rights.

In order to establish and maintain a sustainable system for purchasing raw materials, JFE Steel purchases them with full consideration of respect for human rights, legal compliance, and environmental preservation in accordance with the Raw Materials Purchasing Policy of the company. We also post our purchasing policy on our website to provide information about our policy throughout the supply chain and have begun exchanging opinions with suppliers. Raw materials are purchased after investigating a supplier to confirm that they are not using conflict minerals.

**Web** [Business Conduct Guidelines of the Raw Materials Purchasing Policy →](https://www.jfe-steel.co.jp/en/company/purchase_policy.html)  
[https://www.jfe-steel.co.jp/en/company/purchase\\_policy.html](https://www.jfe-steel.co.jp/en/company/purchase_policy.html)






### ● Respecting the Rights of Workers

The JFE Group adheres to the laws and regulations of various countries as well collective agreements. It also respects the rights to freedom of association as well as their right to collective bargaining.

Upper management, including the president and the representative of the union, meets regularly to discuss matters such as management issues, work-life-balance, working environments, and working conditions. By conducting earnest labor-management consultations, we strive to create a vigorous workplace while working to maintain healthy and sound labor-management relations.

# Initiatives and Relevant SDGs

The JFE Group is taking action to address CSR issues, even in non-material areas. The following chart summarizes all activities introduced in this report. Through these activities, the JFE Group intends to contribute to the achievement of the SDGs.

	Activities	Pages	Related SDGs	
Management	CSR Management	<ul style="list-style-type: none"> <li>Compliance</li> <li>Respect for Human Rights</li> </ul>	19–22	 
Protecting the Environment	Special Features	<ul style="list-style-type: none"> <li>JFE's Initiatives on Climate Change</li> </ul>	25–32	
	Environmental Management	<ul style="list-style-type: none"> <li>Environmental Management System</li> <li>Environmental Education</li> <li>Promoting Green Procurement</li> </ul>	33–36	 
	Climate Change Mitigation	<ul style="list-style-type: none"> <li>Initiatives of Operating Companies</li> </ul>	39–47	   
	Protect the Global Atmosphere and Water	<ul style="list-style-type: none"> <li>Controlling Air Emissions</li> <li>Preventing Water Pollution</li> <li>Management of Chemical Substances</li> </ul>	48–50	   
	Initiatives to Preserve Biodiversity	<ul style="list-style-type: none"> <li>Biodiversity Initiatives</li> <li>Commitments to External Initiatives</li> <li>Products and Technologies to Preserve Biodiversity</li> </ul>	51–52	 
	Resource Recycling	<ul style="list-style-type: none"> <li>Efficient Use of Water (Addressing Water Risk)</li> <li>Reducing Generation and Emission of Co-products and Reusing Co-products</li> <li>Resource Recycling Solution</li> </ul>	53–56	   
	Environmental Communication	<ul style="list-style-type: none"> <li>Disclosing Environmental Data</li> <li>Disclosure and Exchange of Information</li> </ul>	57	  
Contributing to Societal Development	Customers	<ul style="list-style-type: none"> <li>Quality Initiatives</li> <li>Quality Improvement and Enforcement of Quality Assurance Systems</li> <li>Improving Customer Satisfaction</li> <li>Responsible Export Practices</li> </ul>	59–61	      
	Suppliers	<ul style="list-style-type: none"> <li>Fair Competition and Trade</li> </ul>	62	  
	Shareholders and Investors	<ul style="list-style-type: none"> <li>Proactive Information Disclosure</li> </ul>	63	 
	Local Communities	<ul style="list-style-type: none"> <li>Local Activities</li> <li>Support for External Organizations</li> <li>Support for Youth Development</li> <li>JFE 21st Century Foundation</li> </ul>	64–66	          
	Employees	<ul style="list-style-type: none"> <li>Respecting Human Rights</li> <li>Workstyle Reform</li> <li>Operational Reform</li> <li>Workforce Diversity</li> <li>Employee Health and Safety</li> <li>Employee Health</li> <li>Developing Dynamic Work Environments</li> </ul>	67–74	     



# Protecting the Global Environment

JFE Group CSR Report 2019

Special Feature

# JFE's Initiatives on Climate Change

The JFE Group leverages its innovative technology to address climate change and is committed to creating a resilient, sustainable society.

Addressing Risks

CO<sub>2</sub> intensity index



**Ecological Processes and Innovative Technologies**

Ⓢ Coke dry quenching (CDQ) plant



Ⓢ Top pressure recovery turbine (TRT) power generation plant

Ⓢ Regenerative burner

Ⓢ Endless rolling



Ⓢ Waste plastics injection technology for blast furnace

Ⓢ Super-SINTER™



● **Basic Policy**

As an enterprise engaged in iron and steel manufacturing, which is associated with emitting massive volumes of CO<sub>2</sub>, the issue of climate change is a critical managerial concern from the perspective of business continuity. Our steel business, which emits 99.9% of the Group's total CO<sub>2</sub> emissions, has been developing various technologies for saving energy and reducing CO<sub>2</sub> emissions. Applying these to steel manufacturing has successfully reduced CO<sub>2</sub> emission intensity to the lowest level worldwide. We will continue to develop processes to reduce environmental impact further while at the same time seeking to turn this challenge into an opportunity for addressing climate change issues by deploying the technologies we have fostered across the globe.

▶ **Environmental Movements across the World**

- 1997 Kyoto Protocol adopted at COP3 in Kyoto
- 2008 JISF's Voluntary Action Plan launched
- 2013 JISF's Commitment to a Low Carbon Society launched

- 2015 Paris Agreement adopted at COP21
- 2018 JISF announced the Long-term Vision for Climate Change Mitigation

Seize the Opportunity

**Eco Products**

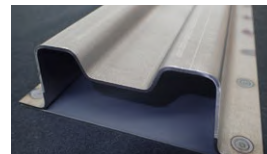
Ⓢ UNI HITEN™



Ⓢ Crack arrest technologies



Ⓢ 1.5 GPa-grade cold-rolled steel sheet for automobiles



Ⓢ JNP™ series electrical steel sheet



**Renewable Energies**

ⓔ Wind power generation



ⓔ Solar power generation



ⓔ Geothermal power generation



**Waste-to-energy Power Generation/ Biomass Utilization**

ⓔ Waste-to-energy power generation



ⓔ Digestion gas power generation



ⓔ Wood biomass power generation



**Climate Change Adaptation Products**

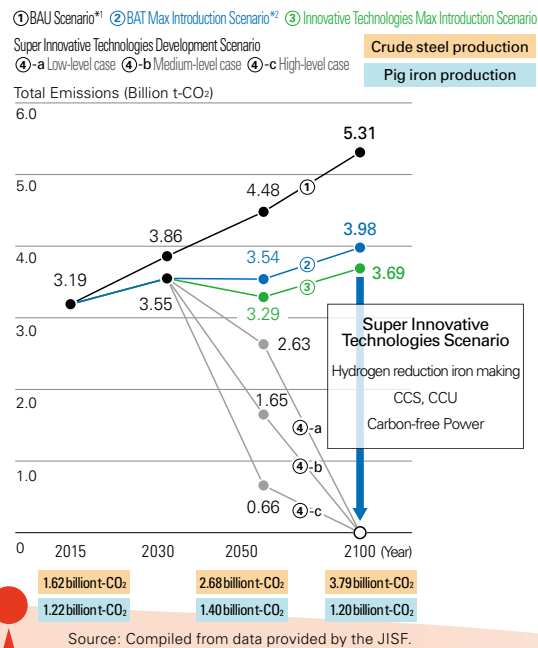
ⓔ Preventing and mitigating disasters



ⓔ Smart agriculture (climate-resilient farming)

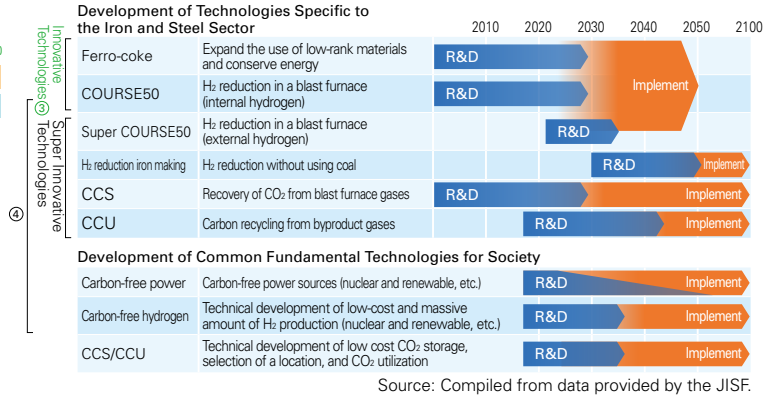


## CO<sub>2</sub> Emissions Based on Long-term Scenarios for Climate Change Mitigation



2018  
82

## Initiatives to Achieve the Long-term Vision for Climate Change Mitigation



### Long-term Vision and Policy

The JFE Group's steel business is led by its operating company, JFE Steel. JFE Steel is a member of the Japan Iron and Steel Federation (JISF), which has committed to the achievement of a low carbon society with the target year of 2030. In November 2018, JISF also formulated and published the Long-term Vision for Climate Change Mitigation for 2030 and beyond to realize zero-carbon steel. JFE Steel was a core member when the long-term vision was formulated.

The Group will continue to develop and disseminate the technologies for achieving the 2°C target stipulated in the Paris Agreement and contribute to the prevention of global warming.

2100  
0

Management  
Protecting the Global Environment  
Contributing to Societal Development

### Initiatives to Date

The JFE Group has developed and maintained a variety of eco-friendly products and technologies, including high-performance steel materials that help save energy when customers use them, as well as renewable energy power generation. We view the current challenges as an opportunity and are contributing to solving the climate change problem.

### Long-term Vision

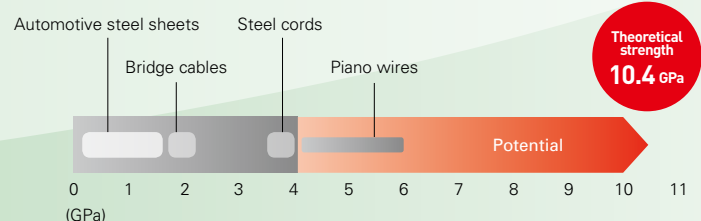
Automobiles are expected to become lighter in weight while the number of electric cars increases. We will support this by improving the functions of the JFE Group's high tensile strength steel sheets and electrical steel sheets. In addition, we will help reduce our carbon footprint by further disseminating renewable energies and implementing recycling initiatives as well as

energy conservation. We will also support national resilience by providing steel for social infrastructure and construction.

### Steel Materials will Continue to Evolve for a Prosperous Future

The mechanical and electromagnetic properties of steel have been significantly enhanced over the years. For example, since the 1970s, automotive steel sheets have been continuously developed to increase strength for various needs and changes in society. These high-strength steels have greatly contributed to reducing CO<sub>2</sub> by reducing the weight of cars leading to improved fuel efficiency. In terms of steel strength, however, we have been able to put into practical use only one-tenth to one-third of the theoretical threshold limits of steel. Japan's steel industry will strive to increase the strengths of steel products while also developing next-generation steel products to be used in the construction of the future hydrogen-oriented infrastructure. Through these initiatives, we will support the infrastructure of a future society and continue contributing to CO<sub>2</sub> reductions throughout steel's entire life cycle.

### Steel's Tensile Strength Achieved as of 2019 (GPa)



Source: Chart and text from the JISF

FY2017  
29.73 million t-CO<sub>2</sub>  
Contribute to CO<sub>2</sub> reduction by providing high-performance steel materials (to be achieved through an eco product)  
(data from JISF ▶ p. 42)

FY2018  
4.12 million t-CO<sub>2</sub>  
Amount equivalent to CO<sub>2</sub> reduction achieved through renewable energy-related plants  
(estimated by JFE Engineering ▶ p. 44)

\*1 BAU Scenario: A scenario based on the idea of "business as usual." \*2 BAT Max Introduction Scenario: A scenario based on maximum introduction of the best available technology.

# Scenario Analysis

The JFE Group will disclose information on how it will address climate change risks and opportunities in accordance with TCFD recommendations, including scenario analysis.

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

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



## Disclosure Consistent with TCFD Recommendations

### TCFD Recommendations

Climate-related risks and opportunities will significantly impact medium- to long-term corporate finance. To reduce the risk of instability in the financial market, the G20 called on the FSB to establish the TCFD.

The TCFD considers disclosure methodologies that can be used to appropriately assess climate-related risks and opportunities and releases its findings as a

final recommendations report.

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

	Overview of TCFD Recommendations	JFE Holdings Disclosure (Corresponding Sections in this CSR Report)	Pages in CSR Report 2019
<b>Governance</b> Disclose the organization's governance around climate-related risks and opportunities	a. Describe the board's oversight of climate-related risks and opportunities	Corporate Governance System Outline	19–21
	b. Describe management's role in assessing and managing climate-related risks and opportunities	Risk Management System	21
<b>Strategy</b> Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning where such information is material	a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	Results of scenario analysis	28–29
	b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	Results of scenario analysis	29–32
	c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario	Results of scenario analysis	29–32
<b>Risk Management</b> Disclose how the organization identifies, assesses, and manages climate-related risks	a. Describe the organization's processes for identifying and assessing climate-related risks	Risk Management System, Framework for Environmental Management	20, 33
	b. Describe the organization's processes for managing climate-related risks		
	c. Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management		
<b>Metrics and Targets</b> Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities	a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process	KPIs for Material CSR Issues	15–18
	b. Disclose Scopes 1 and 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions and related risks	CO <sub>2</sub> Emissions of the JFE Group/ Greenhouse Gas Emissions in the Value Chain	39
	c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets	KPIs for Material CSR Issues	15–18

## Scenario Selection

### ● Scenario Analysis

Scenario analysis is performed to provide an accurate understanding of climate-related risks and opportunities and assess implications to the current business strategy, thereby enabling the organization to establish business strategies that reflect this assessment. We selected the following two scenarios by considering the fact that our

business has potentially high exposure to the impacts of climate change.

Both scenarios are based on those developed by the International Energy Agency (IEA). Analysis is conducted under the assumption that a uniform carbon price is implemented in major emitting countries toward the realization of the 2°C target.

Selected Scenario		2°C Scenario	4°C Scenario
Reference Scenario	Transition Risks	Transition scenarios developed by the IEA <ul style="list-style-type: none"> <li>• Sustainable Development Scenario (SDS)*<sup>1</sup></li> <li>• 2°C Scenario (2DS)*<sup>2</sup></li> </ul>	Transition scenarios developed by the IEA <ul style="list-style-type: none"> <li>• New Policies Scenario (NPS)*<sup>1</sup></li> <li>• Reference Technology Scenario (RTS)*<sup>2</sup></li> </ul>
	Physical Risks	Climate change projection scenario developed by the Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathways (RCP) Scenario* <sup>3</sup>	
How Society will Look		Dynamic policies will be adopted and technical innovations will progress to limit the average temperature rise by the end of this century to 2°C and realize sustainable development. Assume a society in which our business is affected by social changes accompanying transition to a decarbonized society. <ul style="list-style-type: none"> <li>• World-wide/industry-wide uniform carbon pricing*<sup>4</sup></li> <li>• Increase in the ratio of sales of electric vehicles to overall vehicle sales</li> </ul>	Despite new policies implemented in each country based on approaches under the Paris Agreement, average temperature rises about 4°C by the end of this century. Assume a society in which our business is affected by temperature rise and other climate change. <ul style="list-style-type: none"> <li>• Increase in the occurrence of flooding</li> <li>• Sea level rise</li> </ul>

\*1 Source: IEA "World Energy Outlook 2018" \*2 Source: IEA "Energy Technology Perspectives 2017" \*3 Source: IPCC Fifth Assessment Report  
 \*4 If prices of carbon differ from country to country, there will be a gap in international competitiveness between countries that impose strict CO<sub>2</sub> emissions regulations and less strict regulations. This will result in carbon leakage where CO<sub>2</sub> emissions of a strict climate policy country is reduced due to decreased production and investment, while production at and investment to other countries with laxer emission constraints increase, in turn increasing the CO<sub>2</sub> emissions in those countries. One reference scenario, SDS, assumes that carbon pricing is implemented in developed countries and some developing countries. By taking this into account, we formulated the 2°C scenario based on the assumption that a uniform carbon pricing is introduced to major emitting countries to push toward achieving the target of two degrees.

### ● Scope of Business and Period for Analysis

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

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

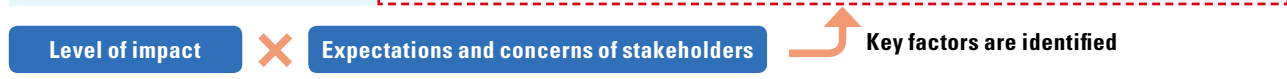
While JISF's Long-term Vision for Climate Change Mitigation represents the industry's challenge toward realizing zero-carbon steel with an eye on 2100, the period covered by our scenario analysis is up to 2050. The reason for this is it will enable us to ensure resiliency in our Group's business strategy at the mid-point of the long-term challenge.

## Process to Identify Key Factors that Impact the Business

### ● Process to Identify Key Factors for Material Risks and Opportunities

Step 1: Examine the entire value chain from a holistic perspective and sort out factors that impact the businesses under analysis.  
 Step 2: Examine all factors from a holistic perspective and identify key factors by taking into consideration the level of impact and stakeholder expectations and concerns.

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



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

## Results of Scenario Analysis

	Changes in Society and Response		Stakeholder Expectations and Concerns for the JFE Group	Results of Assessment
<p><b>2°C Scenario</b></p> <p><b>Key Factor ①</b> Decarbonization of Iron and Steelmaking Process</p>	<p>Increasing social demand for decarbonized iron and steelmaking process</p>	<p>Implement innovative technology to realize decarbonation at a large scale</p> <p>Introduce carbon price</p>	<ul style="list-style-type: none"> <li>Significantly contribute through innovative technologies</li> <li>Increase in investment to implement innovative technologies</li> <li>Increase in operating costs due to introduction of carbon pricing</li> </ul>	<p><b>Opportunity</b> ↗ Develop and put into practical use innovative technologies in addition to existing ones</p> <p><b>Risk</b> ↘ Investment on implementing innovative technologies is feasible</p> <p>↘ The Group's cost competitiveness will be maintained through implementation of a uniform carbon price across all countries</p>
<p><b>2°C Scenario</b></p> <p><b>Key Factor ②</b> Increased Needs for Effective Utilization of Steel Scrap</p>	<p>Increasing interest for electric furnace method for its lower CO<sub>2</sub> emissions</p>	<p>Increasing expectations for electric furnace steel</p> <p>Increasing volume of scraps generated</p>	<ul style="list-style-type: none"> <li>Electric furnace as an alternative to converter furnace</li> <li>Expanding electric furnace steelmaking within the JFE Group</li> </ul>	<p><b>Opportunity</b> ↗ Converter furnace steelmaking is increasing due to constraint on the supply of scrap</p> <p>↗ Expansion in electric furnace steelmaking and electric furnace engineering</p> <p>↗ Expansion in scrap logistics business</p>
<p><b>2°C Scenario</b></p> <p><b>Key Factor ③</b> Change in Demand for Automotive Steel</p>	<p>Shift in demand for automobiles</p> <p>Increasing demand for eco-friendly materials</p>	<p>Increasing demand for EV motors</p> <p>Decreasing demand for internal-combustion engines</p> <p>Cars are lighter in weight and use multi-materials</p> <p>Demand for decarbonization and high recyclability</p>	<ul style="list-style-type: none"> <li>Increase in demand for electrical steel sheets for EV motors</li> <li>Decrease in demand for special steel due to decreased demand for internal-combustion engines</li> <li>Alternative steel material for automobiles to meet the trend of using multi-materials</li> <li>Demand to improve decarbonization and recyclability of steel</li> </ul>	<p><b>Opportunity</b> ↗ Increase in demand for electrical steel sheets due to increase in electric vehicles</p> <p>↗ Increase in demand for special steel due to increased car sales</p> <p>↗ Increase in demand for high tensile strength automotive steel sheets</p> <p>↗ Recyclability of steel is gaining attention again</p> <p><b>Risk</b> ↘ Effect of trend to use multi-materials is limited</p>
<p><b>2°C Scenario</b></p> <p><b>Key Factor ④</b> Increase in Demand for Solutions to Enhance Decarbonization</p>	<p>Transition to decarbonized society</p>	<p>Increasing demand for solutions to promote the transition</p> <p>Overseas expansion of energy-saving technologies</p>	<ul style="list-style-type: none"> <li>Renewable energy power generation plant</li> <li>Promote low-carbon business, or eco solutions, in developing countries using best available technologies (BAT) developed and put into practical use in Japan</li> </ul>	<p><b>Opportunity</b> ↗ Entire construction and operation of renewable energy plants (biomass, geothermal, and solar power generation)</p> <p>↗ Entire construction and operation of incinerators and plastic recycling plants</p> <p>↗ Entire construction of CCU/CCS facilities</p> <p>↗ Overseas expansion of low-carbon business</p>
<p><b>4°C Scenario</b></p> <p><b>Key Factor ⑤</b> Unstable Raw Materials Procurement due to Increased Occurrence of Climatic Hazards</p>	<p>Increasingly devastating climate hazards caused by temperature rise</p>	<p>Raw materials procurement becomes unstable</p>	<ul style="list-style-type: none"> <li>Raw material procurement becomes unstable</li> </ul>	<p><b>Risk</b> ↘ Ongoing specific measures: - Diversify supply sources - Increase plant capacity</p>
<p><b>4°C Scenario</b></p> <p><b>Key Factor ⑥</b> Damage to Production Bases and Offices Caused by Climatic Hazards</p>	<p>Increasingly devastating climate hazards caused by temperature rise</p>		<ul style="list-style-type: none"> <li>Increase in damage caused by typhoons and heavy rain</li> <li>Increase in damage caused by drought</li> <li>Flooding caused by sea level rise</li> </ul>	<p><b>Risk</b> ↘ Measures against flood and drought are already in progress</p> <p>↘ Impact of flooding caused by sea level rise can be addressed with current countermeasures</p>
<p><b>4°C Scenario</b></p> <p><b>Key Factor ⑦</b> National Resilience</p>	<p>Increasingly devastating climate hazards caused by temperature rise</p>	<p>Increasing the importance of enhancing infrastructure</p> <p>Increasing demand for disaster mitigation products</p>	<ul style="list-style-type: none"> <li>Contribute to reinforcing infrastructure with steel and other relevant products</li> </ul>	<p><b>Opportunity</b> ↗ Reinforce infrastructure with steel and other relevant products</p>

# Overview of Scenario Analysis Assessment

## FOCUS Key Factor ① Decarbonization of Iron and Steelmaking Process

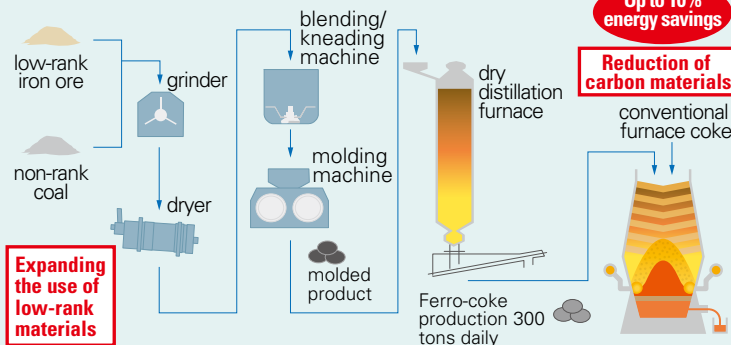
**We are developing innovative technologies to emerge as the pioneer in realizing a decarbonized society. With a strong financial base to meet investments for implementing innovative technologies, we are significantly contributing to the transition to a decarbonized society.**

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

COURSE50 applies hydrogen reduction technology and CCS to reduce CO<sub>2</sub> emissions by about 10% and 20%, respectively, through each technology, for a total reduction of about 30%. The first facility is expected to come online by 2030, followed by the implementation of other plants by 2050, corresponding with the timing for upgrading blast furnace facilities. Ferro-coke is a technology for significantly reducing CO<sub>2</sub> emissions by improving the reduction rate of iron ore put into blast furnaces. In addition to these technologies, we will push forward to establish a hydrogen reduction iron making technology which we will aim to put it into practice after 2030 in order to realize the ultimate goal of creating zero-carbon steel.

We consider implementing innovative technologies as critical and will advance with this strategy together with the government. Furthermore, we have a sufficient financial base to meet necessary investments. Construction of a medium-scale pilot plant with capacity to produce 300 tonnes of ferro-coke per day is currently underway in the Fukuyama district of the JFE Steel West Japan Works.

### Example of Developing an Innovative Technology: Ferro-coke Production Process



### Cost competitiveness will be maintained through a uniform carbon price across all countries.

If a uniform carbon pricing is introduced to major emitting countries, the increase in operating cost will be reflected reasonably on the price of steel products both in Japan and overseas, thus maintaining the Company's cost competitiveness. In addition, since CO<sub>2</sub> emissions per unit of steel production is the lowest of all competing materials, steel retains its superior position in cost competitiveness.

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

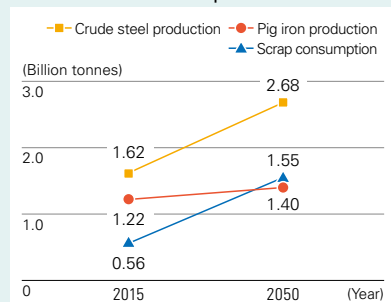
**While the use of steel scrap increases, demand for crude steel will also rise over the long-term. This will result in an increase for pig iron production by blast furnace (converter steel). Furthermore, the entire JFE Group will benefit from opportunities arising from the expanded use of electric furnaces, and it will utilize the construction technology of electric furnaces while expanding the scrap logistics business.**

Steel scrap, a raw material for electric furnace steel, is used efficiently, as it is almost completely recovered in the steel value chain. For society, which expects the realization of the under 2°C scenario, steel is utilized as a basic material that will help achieve the SDGs. Steel accumulation will increase as well as the amount of scrap used. Global steel demand is expected to grow alongside the overall growth in the population and economy, and production of pig iron (converter furnace steel) is also expected to rise to support the development of a sustainable society (JISF: Long-term Vision for Climate Change Mitigation). In addition, under the current technology, the quantity of high-grade steel materials is only feasible using converter furnace steel. This steel and electric furnace steel will co-exist and be used in applicable places.

The JFE Group is viewing the increase in demand for electric furnace steel as well as the world-wide increase in the amount of scrap generated as an opportunity, and it will enhance its electric furnace steel production while applying its engineering technology for constructing an entirely cutting-edge, energy-saving electric furnace facility with the ultimate goal of opening up other business opportunities. Moreover, the Group will advance the development of technologies to utilize scrap and increase the industry-wide use of this material.

Meanwhile, expanding the use of scrap will bring about an increase in logistics for distributing it, and this will provide an opportunity for JFE Shoji Trade to expand its logistics business.

### Estimated Supply and Demand for Steel Production and Scrap Use



**FOCUS** Key Factor ③ Change in Demand for Automotive Steel

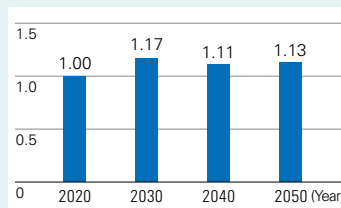
**Demand for electrical steel sheets for EV motors as well as special steel is increasing as global car sales rise. The increase in the intensity of high tensile strength automotive steel sheets contributes to further weight reductions.**

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

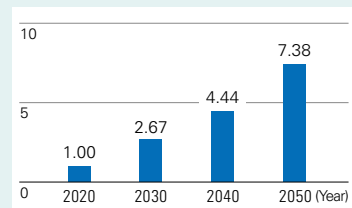
On the other hand, it has been pointed out that an increase in EVs may lead to a decline in the amount of special steel used in engine components. The amount of this type of steel, used in hybrid vehicles and electric vehicles, is 80% and 60% of gasoline cars, respectively. We believe that the risk level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

Nonetheless, the situation for EV remains the same in terms of strong demand for weight reduction of body structure. JFE Steel has developed a cold-rolled steel sheet boasting 1.5 GPa-grade tensile strength as an eco-product and has put it into practical use as an automotive steel sheet. With its high strength, the product can significantly reduce the weight of a car frame and thus dramatically reduce CO<sub>2</sub> emissions from cars in motion.

■ Estimated World Demand for Automotive Special Steel



■ Estimated World Demand for Automotive Electrical Steel Sheets



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

**High recyclability contributing to decarbonization is once again gaining attention, driving up steel demand.**

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

**Effect of trend to use multi-materials is limited.**

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

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

**Contribution through the provision of solutions (renewable energy power generation, recycling plants, and energy-saving steel technologies)**

Demand for power generation plants using non-carbon emitting renewable energies is expected to increase. The JFE Group engages in designing, procuring, constructing, and operating biomass, geothermal, and solar power generation plants in its engineering domain. We are also working on increasing power output at waste processing facilities from the perspective of resource recycling and the effective utilization of resources. JFE Engineering is striving to develop a fully automated operation to facilitate higher power output at incinerators.

Furthermore, we are working on reducing the additional use of materials derived from fossil fuels by using recycled materials in the production of plastic products. JFE Engineering undertakes the construction of recycling plants from design to procurement and construction as well as operation, and J&T Recycling Corporation operates a plastic recycling business.

Industry-wide decarbonization cannot be achieved only through technical developments in the manufacturing process alone. Therefore, we believe that demand for CCU and CCS facilities will increase as they facilitate the efficient use and storage of CO<sub>2</sub>. JFE Engineering is able to undertake the entire process of building CCU and CCS facilities from design and procurement to construction.

From the perspective of the steel industry, there is space for disseminating eco solutions (energy-saving steel technologies) in nations such as China, where close to 50% of the world's crude steel is produced, and India, where further growth in production is expected. The potential CO<sub>2</sub> reduction achieved by internationally transferring and disseminating advanced energy-saving technologies widely used in Japan will exceed 400 million t-CO<sub>2</sub> world-wide. Japan is estimated to contribute to the reduction of approximately 80 million t-CO<sub>2</sub> in 2030 through these technologies.



Biomass power generation plants



Waste-to-energy power generation plant



**FOCUS** Key Factor ⑤ Unstable Raw Material Procurement due to Increased Occurrence of Climatic Hazards**Ongoing initiatives to address the issue, such as alternative procurement and dispersed supplier bases, and increasing plant capacity.**

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

To address this issue, we are promoting alternative procurement and dispersed supplier bases as well as increasing plant capacity.

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

**Increasing plant capacity:** Respond to disaster by establishing greater resilience in adjusting demand and supply by increasing production capacity through renovation and establishing new facilities.

**FOCUS** Key Factor ⑥ Damage to Production Bases and Offices Caused by Climatic Hazards**Measures against flood and drought in progress; impact of flooding caused by rising sea levels can be addressed with current countermeasures.**

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

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

**FOCUS** Key Factor ⑦ National Resilience**Contribute to infrastructure enhancement with products such as a high-strength H-shaped steel, high-strength steel pipe pile, and hybrid tide embankments.**

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

The JFE Group will gather its collective energy to provide disaster prevention products such as a high-strength H-shaped steel, high-strength steel pipe pile, and hybrid tide embankments in addition to the reconstruction of infrastructure.



Hybrid tide embankments

**Addressing Climate Change Issues****The JFE Group considers addressing climate change issues as an extremely important managerial challenge. We respond to risks and opportunities to enable sustainable growth and disclose information about our related actions.**

Addressing climate change issues is an extremely important managerial challenge for the JFE Group, not only from the perspective of business risks but also in terms of opportunities to contribute to the realization of a sustainable society.

The TCFD's final recommendations, published in 2017, encourage companies to disclose their resilience strategies for responding to climate change issues through scenario analysis. The JFE Group announced its endorsement of the recommendations in May 2019, and this report is our first disclosures in line with TCFD recommendations. The report provides information on our risk management for the 2°C and 4°C scenarios in addition to our commitment to addressing issues through the development of an innovative iron and steelmaking process, eco-friendly products and technologies, and efforts for strengthening national resilience. We hope this information will be noted by many investors and other stakeholders and encourage dialogues for deepening understanding of the measures that the Group is taking.

**Hiroyuki Fujiwara**

Senior Vice President of JFE Holdings, Inc.

# Environmental Management

## Environmental Philosophy and Strategies

The JFE Group’s environmental philosophy and strategies target the development of innovative technologies and international cooperation aimed at protecting the global environment.

### Environmental Philosophy

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

### Environmental Strategies

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

## Framework for Environmental Management


The JFE Group Environmental Committee, chaired by the president of JFE Holdings and operating under the JFE Group CSR Council, sets goals for environmental protection, monitors the progress of such initiatives and works to improve the Group’s overall environmental performance. Key issues for corporate management

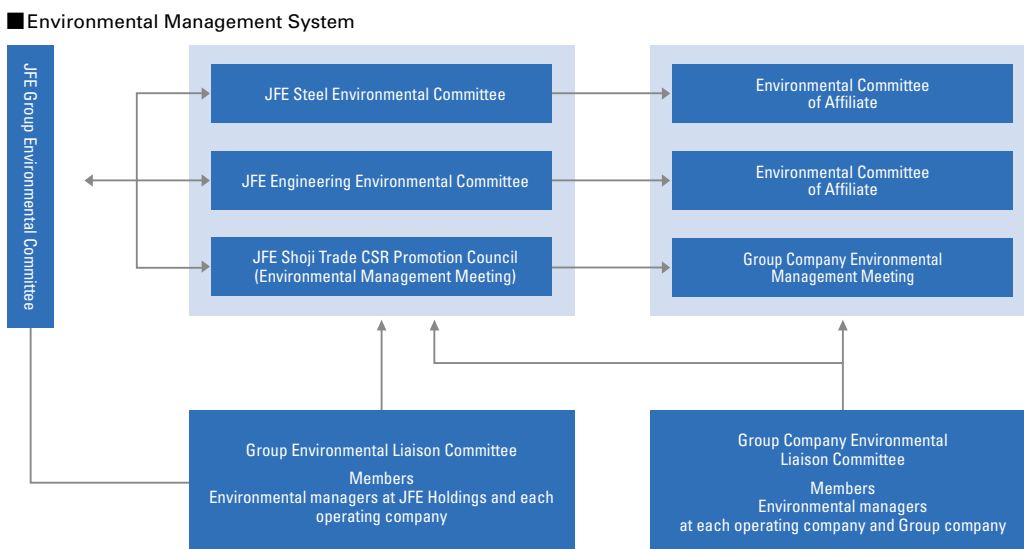
such as climate change are deliberated at the Group Management Strategy Committee as well and reported to the Board of Directors. The board oversees environmental challenges by discussing the reported material. Additionally, specialized committees set up by JFE Group operating companies and affiliates implement specific activities.

▶▶ P. 19 JFE CSR System

## Environmental Management System

Acquisition of ISO 14001 certification is an important part of every JFE Group company’s environmental program. All global production sites of JFE Steel and JFE Engineering and major offices of JFE Shoji Trade have received certification, encompassing 72% of 41,416 employees at 79 companies covered in this report. During the reporting period, there was no material breach of any environmental law or regulation by any operating company, and no environmental protection violation notice was received from any governmental authority.

 JFE Steel has an Environment Management Department at its head office and in each business office, and the Environmental Committee chaired by its president and the Environment Management Committee in each local office. All JFE Steel production sites have obtained ISO 14001 certification, as have 16 of 37 major subsidiaries, for all operations or at least those related to production.



**E** JFE Engineering's Environmental Management System, which encompasses all employees, works to minimize environmental impact at production sites and branch offices and contribute to environmental protection through all products and services. The major strategies for FY2019 are (1) promote environmental contribution through products for mitigating global warming and climate change, (2) promote effective energy conservation and resource recycling, and (3) ensure thorough compliance with Waste Management And Public Cleansing Law by enhancing audit details to confirm compliance with environmental laws and regulations and by applying a system to manage industrial disposal manifests.

Of JFE Engineering's 10 major group companies, 4 have obtained ISO 14001 certification.

**T** JFE Shoji Trade obtained ISO 14001 certification for its head office, Osaka branch, and Nagoya branch in 2000. Thereafter, the company secured certification of 23 group companies in Japan, including branch and sub-branch offices and 9 manufacturing firms, to ensure thorough environmental management throughout the JFE Shoji Trade group. Overseas, 12 manufacturing group companies have obtained ISO 14001 certification.

## Environmental Auditing

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

**S** Once a year, JFE Steel's Audit Department and the Environment, Disaster Prevention and Recycling Department conduct an environmental audit at each operational site. Companies are grouped



Environmental audit of JSGL in Indonesia

by risk assessments of equipment, etc., using self-checks based on checklists, part of an extensive audit conducted every one to five years. A total of 170 business sites of JFE Steel companies require auditing, of which 25 were audited in FY2018, including two overseas sites.

**E** JFE Engineering places a top priority on complying with environmental laws and regulations. To verify compliance with these regulations, environmental inspections are conducted at all construction sites by the department responsible for construction, and manufacturing sites conduct self-checks on an annual basis to confirm legal compliance.

In addition, about 50 sites, selected from among the Tsurumi and Tsu manufacturing sites, construction sites in Japan, and group company sites, are audited each year by the Safety and Environment Department to confirm compliance with environmental laws and regulations. JFE Engineering also conducts internal audits on its own environment management system to evaluate and enhance the effectiveness of various environment-related initiatives.


**T** At JFE Shoji Trade, the Environmental Auditing Department conducts internal environmental audits at all of its affiliate companies that are ISO 14001-certified annually. Non-certified group companies are also audited once every three years by the Audit Department.

## Environmental Education


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

**S** JFE Steel encourages employees to obtain qualifications as pollution-control managers. In FY2018, 96 persons were qualified, bringing the total to 1,598 since 2005. A training program launched in FY2011 for environmental managers at group companies was held three times in FY2018. In addition, JFE Steel provides employees with annual training to ensure compliance with environmental laws, and it disseminates information about regulatory revisions at its semiannual Environmental Liaison

Committee meetings for companies in its group. Brush-up training in waste management skills for on-site personnel is held four times a year.

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

In FY2019, the Safety and Environment Department and other departments worked together to create and implement an education program with details tailored to the specific needs of each department.

 JFE Shoji Trade complies with ISO 14001 requirements by providing all employees with general environmental training and specialized training for internal audit staff on an annual basis. In addition, each company performs a self-check using its own extensive checklist to ensure understanding and rigorous compliance with environmental laws. Also, JFE Shoji Trade provides environmental training to

new executives at group companies and information about revised laws and regulations to environmental management personnel.

## Promoting Green Procurement

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

## Environmental Accounting

### Basic Approach

The JFE Group is saving energy and reducing its environmental impacts by making its production facilities increasingly efficient and introducing more environmentally friendly equipment. Such investments, which are categorized as environmental costs, cover equipment, facilities, and related expenditures for environmental protection and impact reduction.

### Breakdown of Environmental Costs

Main Items		FY2017		FY2018	
		Investment (billion yen)	Cost (billion yen)	Investment (billion yen)	Cost (billion yen)
Management	Impact monitoring and measurement, and EMS expenses and education	0.2	2.5	0.3	2.7
Global warming countermeasures	Saving and efficiently using energy	18.0	27.8	12.4	28.6
Conservation of natural resources	Recycling industrial water	2.8	17.1	2.4	17.8
	Recycling and waste management of internally generated materials, etc.	0.09	5.3	1.77	4.8
Environmental protection	Air pollution countermeasures	19.1	35.6	9.9	31.6
	Water pollution countermeasures	1.6	9.2	1.8	10.0
	Prevention of soil contamination, noise, vibration, and subsidence	0.02	0.7	0.00	0.6
Other	Charges, etc.	—	1.4	—	1.6
R&D	Technologies for protecting the environment, saving energy, and preventing global warming	1.4	11.7	1.2	12.9
Societal activities	Support for nature preservation and forestation, information disclosure, exhibitions, and public relations	—	0.7	—	0.7
Total		43.3	112.1	29.8	111.3

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

### ● Environmental Investment and Expenses

Environmental capital investment totaled 29.8 billion yen and expenses amounted to 111.3 billion yen in FY2018. Capital expenditure included 12.4 billion yen for measures to prevent global warming (measures to address climate change), 9.9 billion yen for air pollution countermeasures, and 1.8 billion yen for water pollution prevention. Environmental capital investment as a percentage of overall capital investment was roughly 12%.

Environmental expenses for environmental activities included 31.6 billion yen for air pollution countermeasures, 28.6 billion yen for global warming countermeasures (measures to address climate change) and 17.8 billion yen for industrial water recycling. Environmental R&D expenses came to 12.9 billion yen.

### ● Capital Investment

To save energy and reduce environmental impacts stemming from production, the JFE Group invests in environmental technologies for plants and equipment. Cumulative investment in energy savings, totaling 505.4 billion yen since 1990, has enabled the company to achieve energy efficiencies that are among the highest in the world. In total, the Group has invested 708.5 billion yen in environmental protection since 1973.

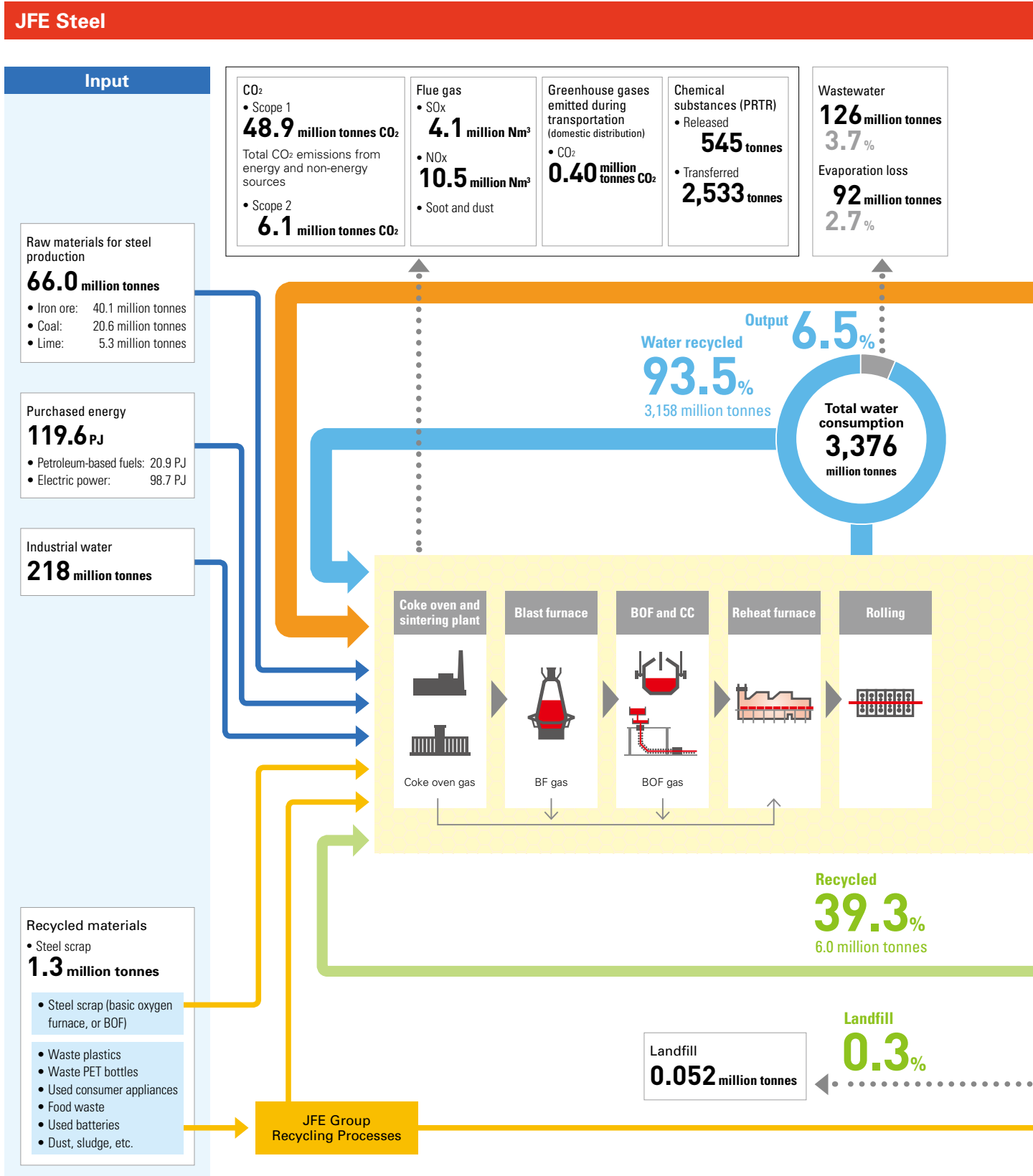
### ● Results of Environmental Activities

Environmental protection costs include efforts to lower unit-based CO<sub>2</sub> emissions to prevent global warming and measures to reduce final-disposal waste and conserve natural resources through recycling. Other benefits include reduced discharges of airborne and waterborne substances with pollution loads and compliance with statutory regulations concerning exhaust gas emissions and discharged water.

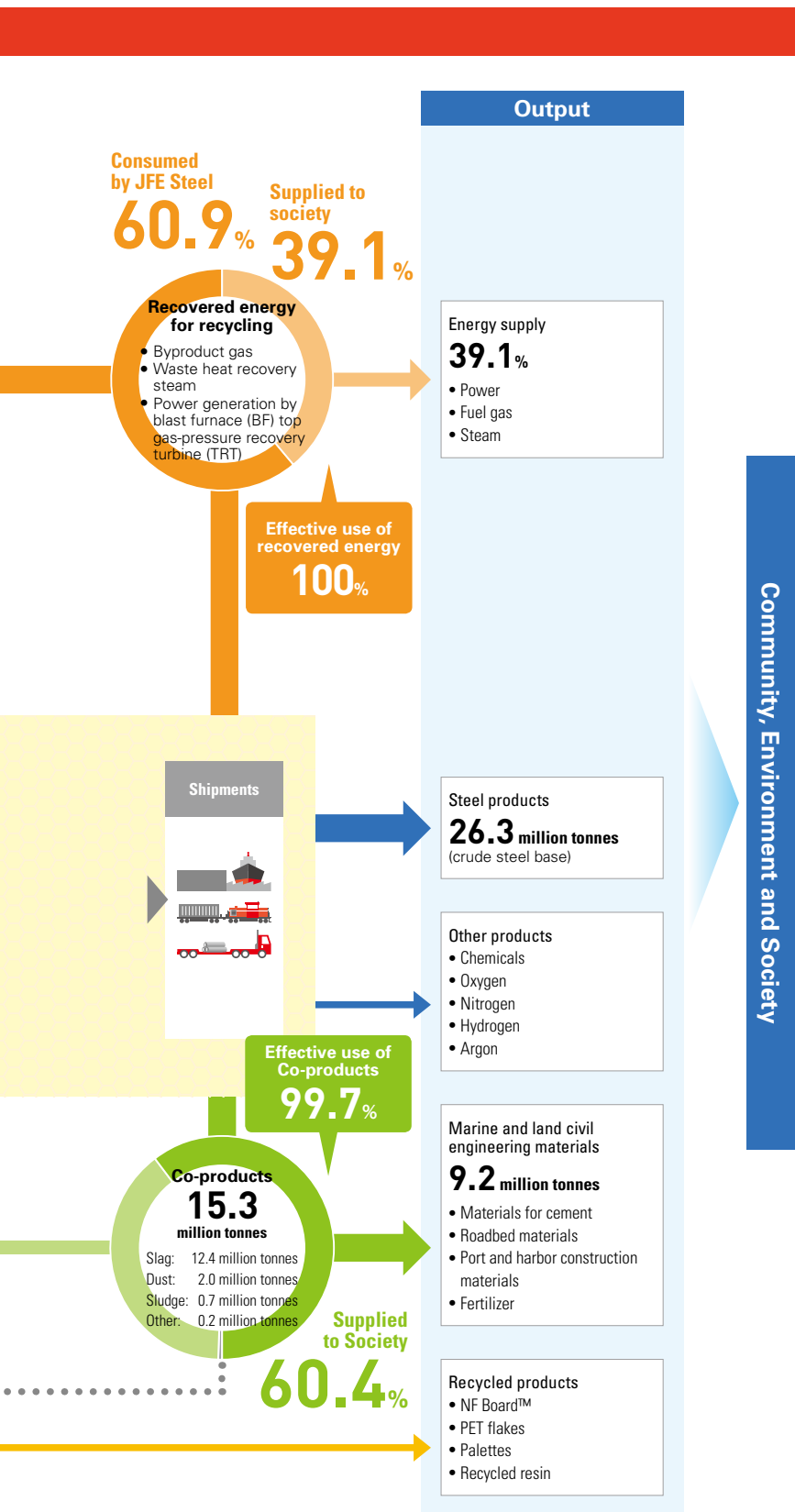
The monetary value of energy savings realized through environmental capital investments and expenses in FY2018 is about 1.0 billion yen.

# Material Flow

JFE Steel works to reduce the environmental impact of its iron and steelmaking processes, including through the effective use of resources. The company recycles **93.5%** of the water it uses for production and uses **99.7%** of its co-products, such as iron-steel slag. In addition, **100%** of co-product gas generated during production is reused as fuel for reheating slabs, generating power for internal use and supplying power to the public.



→ Supply •••→ Emissions



## JFE Engineering (Head Office and Works)

Input	
<b>Steel</b>	<b>47,300 tonnes</b>
<b>Energy</b>	
• Electric power purchased	<b>26.8 GWh</b>
• Class A heavy oil	<b>330.2 kl</b>
• Kerosene	<b>12.6 kl</b>
• Light oil	<b>221.7 kl</b>
• Gasoline	<b>14.8 kl</b>
• City gas	<b>357,800 Nm<sup>3</sup></b>
• LPG	<b>118.8 tonnes</b>
<b>Water</b>	<b>101,700 tonnes</b>

JFE Engineering	
• Tsurumi Works	
• Tsu Works	

Output and Emissions	
<b>Products</b>	<b>44,500 tonnes</b>
<b>CO<sub>2</sub></b>	<b>13,800 tonnes CO<sub>2</sub></b>
• Scope 1	<b>6,800 tonnes CO<sub>2</sub></b>
• Scope 2	<b>7,000 tonnes CO<sub>2</sub></b>
<b>Waste generated</b>	<b>1,500 tonnes</b>
• Industrial wastes	<b>1,200 tonnes</b>
• General wastes	<b>318 tonnes</b>
<b>Wastewater (ocean only)</b>	<b>146,000 tonnes</b>
<b>Others (PRTR)</b>	<b>175 tonnes</b>

# Climate Change Mitigation

## Basic Approach

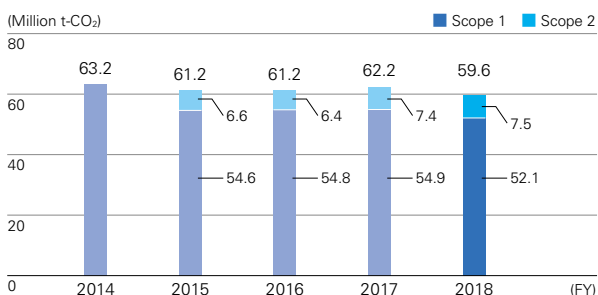
The JFE Group's business involves steel manufacturing, which emits large amounts of CO<sub>2</sub>. Therefore, climate change is a serious management concern from the viewpoint of the Group's business continuity. The steel business, which accounts for 99.9% of the Group's CO<sub>2</sub> emissions, has developed many technologies for saving energy and reducing CO<sub>2</sub> emissions and has adopted them in its steel manufacturing process. As a result, CO<sub>2</sub> emission intensity in its steel manufacturing process is the lowest in the world. The JFE Group also develops and possesses many other eco-friendly products and technologies such as high-performance steel materials that contribute to the customer's energy saving and power generation using renewable energy.

Going forward, the Group will continue to achieve technical advances in products and services while at the same time expanding the uses of technologies it has accumulated over many years throughout its global operations, all part of its contribution toward mitigating climate change.

## CO<sub>2</sub> Emissions of the JFE Group

JFE's CO<sub>2</sub> emissions are mainly generated by its steel business. However, beyond reducing CO<sub>2</sub> emissions from steel production process, each company sets specific targets corresponding with their operations to further save energy and reduce CO<sub>2</sub> emissions.

### CO<sub>2</sub> Emissions of the JFE Group



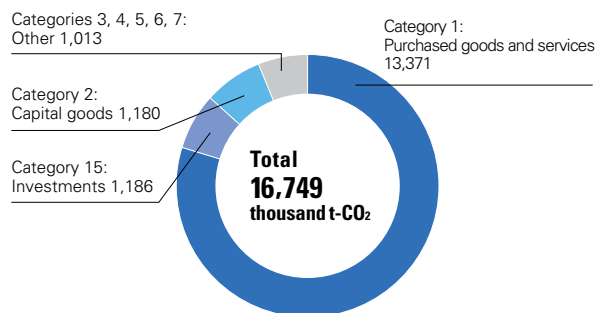
Data cover 76 companies, including JFE Steel and 30 major domestic and overseas subsidiaries, JFE Engineering and 10 major domestic subsidiaries, and JFE Shoji Trade and 33 major domestic and overseas subsidiaries.

Notes: Data for JFE Steel include CO<sub>2</sub> emissions from non-energy sources. Starting with FY2018, data for JFE Steel's subsidiaries and JFE Engineering's subsidiary include CO<sub>2</sub> emissions from non-energy sources.

### CO<sub>2</sub> Emissions by Operating Company (FY2018)

JFE Steel	JFE Engineering	JFE Shoji Trade
59,357 thousand t-CO <sub>2</sub>	212 thousand t-CO <sub>2</sub>	36 thousand t-CO <sub>2</sub>
99.58%	0.36%	0.06%

### Scope 3 Emissions of the JFE Group (FY2018)



Coverage: (Categories 1, 2, 3, 4, 5) JFE Steel, 25 JFE Steel domestic subsidiaries, JFE Engineering, and JFE Shoji Trade (Category 6, 7) JFE Steel, 25 JFE Steel domestic subsidiaries, JFE Engineering, 10 JFE Engineering domestic subsidiaries, and JFE Shoji Trade (Category 15) Japan Marine United, and 9 JFE Steel equity-method affiliates (7 domestic and 2 overseas)

Sources: Green Value Chain Platform (Ministry of the Environment) and others

## Energy Savings and CO<sub>2</sub> Reduction in Iron and Steelmaking

### Initiatives to Save Energy and Reduce CO<sub>2</sub>

JFE Steel has always aggressively pursued CO<sub>2</sub> reduction and energy savings, including the introduction of energy-saving equipment.

### Energy Consumption and CO<sub>2</sub> Emissions in FY2018

Energy consumption and CO<sub>2</sub> emissions in iron and steelmaking are greatly influenced by production volume. To accurately assess the effects of improvements due to operational technologies and capital investments, JFE Steel is working to reduce its intensity (energy consumption and CO<sub>2</sub> emissions per unit of production) and related energy-conservation activities.

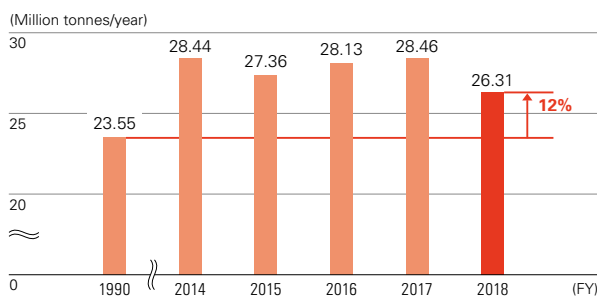
JFE Steel's crude steel production was 26.31 million tonnes in FY2018, down 8% from FY2017 and up 12% from FY1990. However, thanks to ongoing energy-saving activities, energy consumption was down 9% and CO<sub>2</sub> emissions were down 9% from FY1990.

The company's energy consumption intensity in FY2018 was 19% below the FY1990 level at 23.2 GJ/

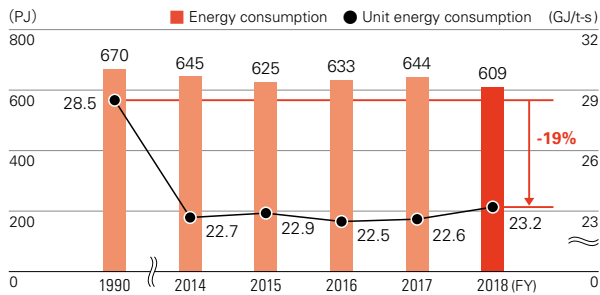


t-steel, while CO<sub>2</sub> emission intensity was down 18% to 2.02 t-CO<sub>2</sub>/t-steel. The results prove the success of JFE Steel's energy-saving activities in recent years, including capital investments in energy conservation and promotion of energy conservation through the visualization of the reheat furnace fuel basic unit.

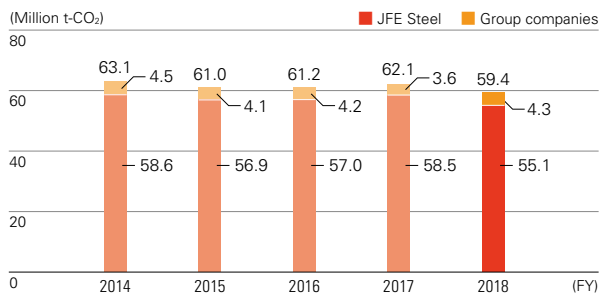
### Production of Crude Steel of JFE Steel



### Energy Consumption and Unit Energy Consumption of JFE Steel

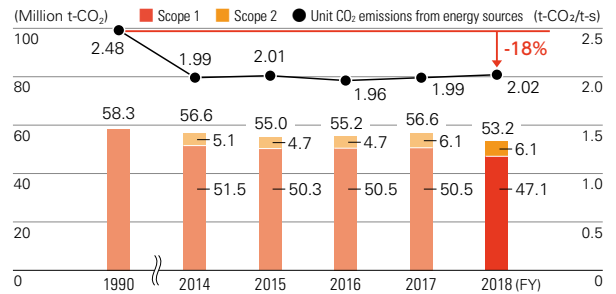


### CO<sub>2</sub> Emissions of JFE Steel Group



Data cover JFE Steel and 30 consolidated subsidiaries in Japan and overseas.  
Note: Data for FY2018 include CO<sub>2</sub> emissions from non-energy sources at the subsidiaries.

### CO<sub>2</sub> Emissions from Energy Sources and Unit CO<sub>2</sub> Emissions of JFE Steel

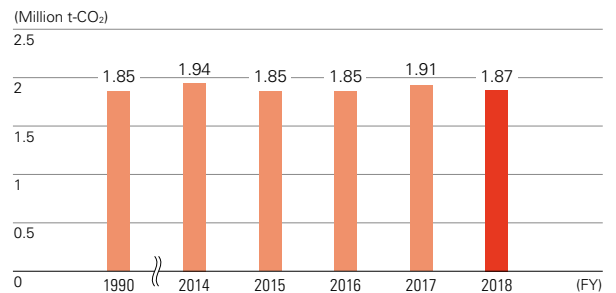


Note: The CO<sub>2</sub> emissions and emission intensity in FY2018 are calculated using the CO<sub>2</sub> emission factor for electricity purchased in FY2017 on the Japan Iron and Steel Federation's Commitment to a Low Carbon Society.

### CO<sub>2</sub> Emissions from Non-energy Sources

Lime and dolomite, which are used as auxiliary materials in blast furnaces and converters, emit CO<sub>2</sub> in decomposition.

### CO<sub>2</sub> Emissions from Non-energy Sources of JFE Steel



Data cover JFE Steel

## Steel Industry Initiatives

### Japan Iron and Steel Federation (JISF) Initiatives

#### Long-term Vision for Climate Change Mitigation

In addition to ongoing efforts to achieve the Commitment to a Low Carbon Society, JISF has formulated and announced the long-term vision for climate change mitigation in 2030 and beyond, which is intended to realize zero-carbon steel. JFE Steel played an important role in formulating this vision.

Mid-term (~2030) Initiatives	<ul style="list-style-type: none"> <li>Promotion and expansion of The Three Ecos Initiatives</li> <li>Development and implementation of innovative new iron and steelmaking processes</li> </ul>
Long-term (~2050) Initiatives	<ul style="list-style-type: none"> <li>Promotion of innovative new iron and steelmaking processes</li> <li>Development of super innovative iron and steelmaking processes and CCS/CCU technologies</li> </ul>
End (~2100) Vision	<ul style="list-style-type: none"> <li>Realization of zero-carbon steel</li> <li>Implementation of super innovative iron and steelmaking processes</li> </ul>

#### The Commitment to a Low Carbon Society

The Japan Iron and Steel Federation (JISF) is promoting its Commitment to a Low Carbon Society, which focuses on the Three Ecos initiatives and the development of innovative new iron and steelmaking processes. JFE Steel is actively implementing initiatives to help achieve the plan's targets.

#### Assessment of Commitment to a Low Carbon Society Results (JISF)

In FY2017 emissions by the Japanese steel industry decreased by 2.29 million t-CO<sub>2</sub> compared to the BAU emissions\* benchmark. Various self-improvement efforts, such as raising the efficiency of coke ovens and generation facilities, are steadily contributing to this reduction. JFE Steel is actively working on these self-improvement efforts as well as investing in research and development for new energy-saving technologies.

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

#### Revolutionary Iron and Steelmaking Process Development

##### COURSE50

About 30% of CO<sub>2</sub> emissions can be reduced through hydrogen reduction along with separation and capture of CO<sub>2</sub> from blast furnace gases. The first facility is expected to come online by 2030, followed by other plants by 2050.

##### Ferro Coke

The Japanese steel industry intends to develop ferro coke that accelerates and lowers the temperatures of the reduction reaction in a blast furnace as well as its operational processes to conserve energy further and

#### CO<sub>2</sub> Reduction Medium- to Long-Term Targets (Japan Iron and Steel Federation's "Commitment to a Low Carbon Society")

Three Ecos		Eco Processes	Eco Products	Eco Solutions
Goal		Further improve energy efficiency by taking full advantage of cutting-edge technologies	Provide high-performance steel materials that result in high performing end-products and thus reducing CO <sub>2</sub> emissions	Reduce CO <sub>2</sub> in developing countries through the transfer and application of world-leading, energy-saving Eco Process technologies
Targets	FY2020 (phase-I)	Reduce CO <sub>2</sub> emissions by 5 million t-CO <sub>2</sub> compared to the BAU benchmark <ul style="list-style-type: none"> <li>Energy conservation: 3 million t-CO<sub>2</sub></li> <li>Efficient use of waste plastics, etc.: 2 million t-CO<sub>2</sub></li> </ul>	The use of major high-performance steel materials to contribute to a CO <sub>2</sub> reduction of approximately 34.0 million t-CO <sub>2</sub>	Estimated CO <sub>2</sub> reduction impact of 70 million t-CO <sub>2</sub>
	FY2030 (phase-II)	Reduce CO <sub>2</sub> emissions by 9 million t-CO <sub>2</sub> compared to the BAU benchmark	The use of major high-performance steel materials to contribute to a CO <sub>2</sub> reduction of approximately 42.0 million t-CO <sub>2</sub>	Estimated CO <sub>2</sub> reduction impact of 80 million t-CO <sub>2</sub>
Status as of FY2017 year-end		Reduced 2.29 million t-CO <sub>2</sub> emissions (energy conservation etc.), compared to the BAU benchmark	Domestic and international use contributed to a CO <sub>2</sub> reduction of 29.73 million t-CO <sub>2</sub>	CO <sub>2</sub> reduction impact of 62.59 million t-CO <sub>2</sub>

Source: Public data from the Japan Iron and Steel Federation

expand the use of low-rank materials. Currently, a medium-scale plant capable of producing 300 tonnes of ferro coke per day is being constructed in JFE Steel's West Japan Works (Fukuyama district) to establish the technology for producing and using the material.

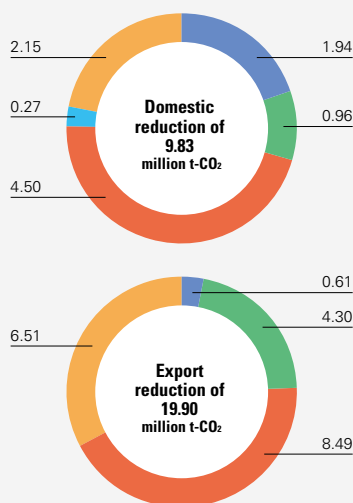
### Reduced CO<sub>2</sub> Emissions through High-performance Steel Materials (Effects of Eco Product)

The Japan Iron and Steel Federation expects the use of high-performance steel materials to reduce CO<sub>2</sub> emissions. It is estimated that the use of 5 major high-performance steel materials for cars, transformers, ships, power generator boilers, and trains in Japan and overseas (FY2017 production: 6.95 million tonnes, 6.6% of crude steel production) helped to reduce CO<sub>2</sub> emissions by 29.73 million tonnes in FY2017.

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

#### CO<sub>2</sub> Reduction Resulting from the Use of Five High-performance Steel Materials in Japan and Abroad (FY2017)

Ships Power-generator boilers Cars Trains Transformers



## Global Scale Initiatives

### Addressing Global Warming

ISO 14404 is an international standard proposed by the Japan Iron and Steel Foundation (JISF) to the International Organization for Standardization (ISO) as a methodology for the globally unified calculation of CO<sub>2</sub> intensity from iron and steel production, ultimately to assess the energy efficiency of steelworks. The Japanese steel industry is addressing global warming through international public-private collaborations, including ISO 14404-based assessment of steelworks in developing countries and recommending specific technologies best suited to India and ASEAN countries. It is continuing this effort together with the Ministry of Economy, Trade and Industry (METI) in order to enhance ISO 14404 so that it can be applied to steel manufacturing facilities with more complex structures.

JFE Steel is also addressing global warming by participating in international activities, such as the Japan-India Public and Private Collaborative Meeting, the Japan-ASEAN Steel Initiative and the Japan-China Steel Industries Exchange. In addition, JFE Steel is involved with the World Steel Association (WSA)'s Climate Action Program, which uses ISO 14404 as the standard for measurement and calculation.



Japan-ASEAN Steel Initiative



Climate Action Member Certification

## Contribution to the Development of Life Cycle Inventory Calculation in LCA

In order to accurately evaluate the environmental impact of products, assessment and quantification is required over their entire life cycles, from raw resource mining to material production, product manufacture, use and final disposal. Life Cycle Assessment (LCA) is one method for conducting this evaluation.

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

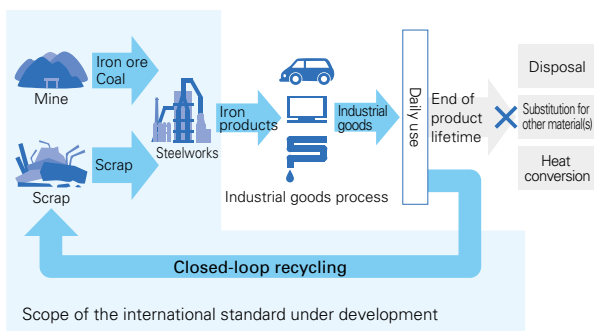
The standard for appropriately considering this ability of steel products to undergo closed-loop recycling was published in November 2018.

ISO 20915 (life cycle inventory calculation methodology for steel products) was developed by JISF with JFE Steel playing a major role, and provides a life cycle inventory (LCI) calculation method specific to steel products that takes into account the effects of recycling.

In addition, the Japan domestic version of this standard, JIS Q 20915 (life cycle inventory calculation methodology for steel products), was published in June 2019.

Notes: JFE Steel, together with the WSA (World Steel Association, comprising of approximately 170 steel manufacturers and steel-related organizations) and the Japan Iron and Steel Foundation (JISF), is working to establish LCA as an international standard methodology for calculating LCI for steel materials.

### Life Cycle of Steel Materials



## CO<sub>2</sub> Reduction Initiatives

### Initiatives towards CCU/CCS

In order to reduce CO<sub>2</sub> emissions from the steel manufacturing process, JFE Steel is actively engaged in the development of new technologies to separate and recover CO<sub>2</sub> from blast furnace gas. This is in line with the JISF's COURSE50 project (CO<sub>2</sub> Ultimate Reduction in Steelmaking Process by Innovative Technology for Cool Earth 50), which focuses on hydrogen reduction of iron ore and separation and recovering of CO<sub>2</sub> from blast furnace gas. JFE Steel has been working on developing for practical use a physical adsorption technology for separating and capturing CO<sub>2</sub>, which could then be fed to carbon capture and storage (CCS).

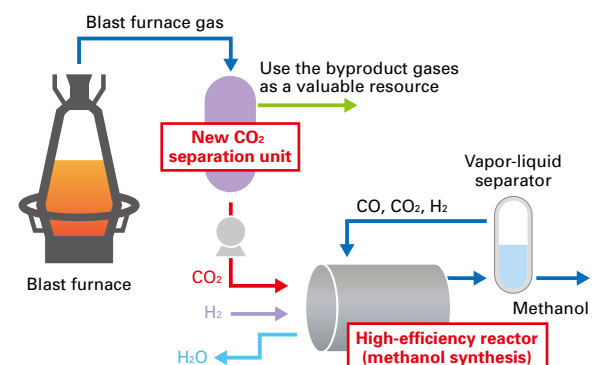
More recently, JFE Steel has also initiated R&D into the effective use of CO<sub>2</sub> separated and recovered from blast furnace gas and is one of the first domestic steel manufacturers to explore this field. JFE Steel is a participating member of NEDO\*<sup>1</sup> projects for the development of next-generation thermal power generation technologies / development of basic technologies for next-generation thermal power generation / development of CO<sub>2</sub> utilization technology project, and as such, it is working on an initiative together with RITE\*<sup>2</sup> to develop new technologies for separating and recovering CO<sub>2</sub> from blast furnace gas and utilizing it to synthesize methanol (CH<sub>3</sub>OH).

In this project, JFE Steel is developing technologies that lower the cost of CO<sub>2</sub> separation and recovery that meets the objectives of CCU and process design for effective CO<sub>2</sub> utilization. The expertise in CO<sub>2</sub> separation and recovery technologies it has acquired through the COURSE50 project is applied to CCU.

\*1 New Energy and Industrial Technology Development Organization

\*2 Research Institute of Innovative Technology for the Earth

### CCU Technology



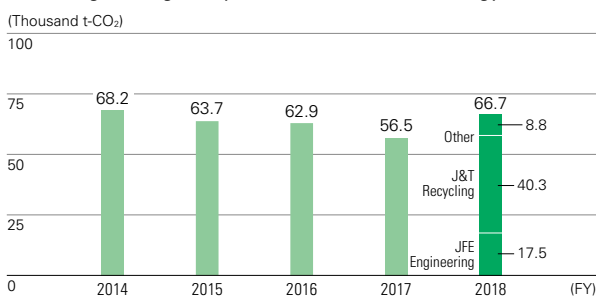
**E** JFE Engineering strives to reduce CO<sub>2</sub> emissions in society through our clients and their daily operations by providing them with eco-friendly products and technologies, including those that harness renewable energy and energy-saving products.

For example, if all of the renewable energy-related plants that JFE Engineering has constructed by FY2018, including those currently under construction, were in operation, their estimated contribution\* to CO<sub>2</sub> reduction would mount up to 4.12 million tonnes per year. Furthermore, JFE Engineering strives to reduce its own CO<sub>2</sub> emissions in accordance with the Energy Conservation Law, from its head office, branch offices, and works.

In FY2018, CO<sub>2</sub> emissions increased by approximately 120 thousand tonnes compared to the previous fiscal year due to the merger with Tokyo Waterfront Recycle Power. The JFE Engineering group has been achieving the reduction target set by the Energy Conservation Law every year since FY2015. Companies of the group each have their own energy saving initiatives that are appropriate for their businesses to make their contribution in reducing overall CO<sub>2</sub> emissions.

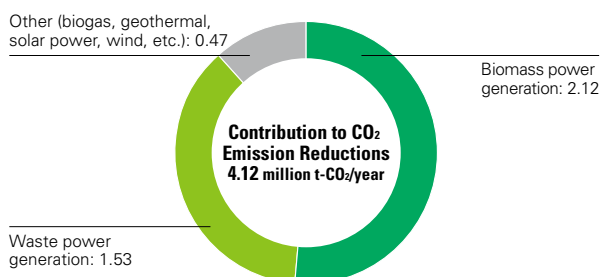
\*For renewable energy power generation plants, the characteristics of each plant is taken into consideration while estimating their CO<sub>2</sub> emissions.

#### ■ JFE Engineering Group's CO<sub>2</sub> Emissions from Energy Sources



Data cover CO<sub>2</sub> emissions from energy sources by JFE Engineering and 10 consolidated subsidiaries in Japan.

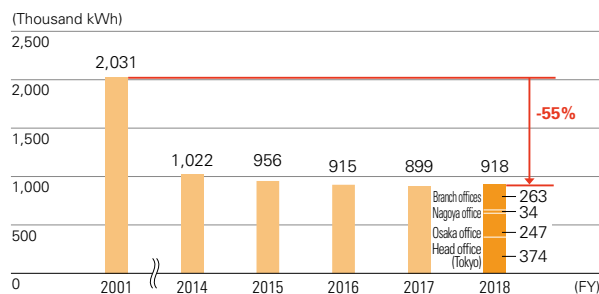
#### ■ Contribution to CO<sub>2</sub> Emission Reductions by Renewable Energy Plants (FY2018)



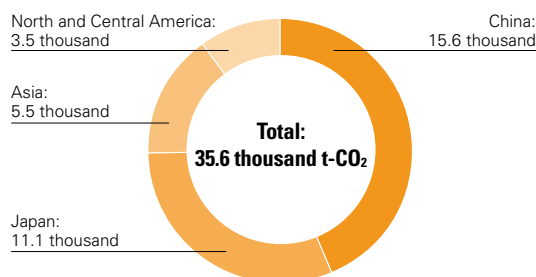
**T** JFE Shoji Trade offices in Japan work to reduce their use of energy and paper as well as strictly manage waste separation. Energy consumption has been lowered significantly by observing days when employees are encouraged to leave work on time, prohibiting night work, and introducing pinpoint lighting. In FY2018, as in the previous year, the company has achieved more than a 50% reduction in energy consumption compared to FY2001.

In addition, the company has introduced video conferencing systems in offices worldwide to reduce printed reference materials and domestic and international business trips.

#### ■ Electric Power Consumption by JFE Shoji Trade



#### ■ CO<sub>2</sub> Emissions of the JFE Shoji Trade Group (FY2018)



The graph shows CO<sub>2</sub> emissions from electric power consumption by JFE Shoji Trade and 33 consolidated subsidiaries (steel-processing companies) in Japan and overseas.

## Disclosure of CO<sub>2</sub> Reduction Initiatives

JFE Holdings is responding to requests to disclose its efforts to mitigate climate change and is providing inputs to the Carbon Disclosure Project (CDP)\*.

\*An international non-profit organization that works with institutional investors to collect and disclose information from corporations on their greenhouse gas emissions and other climate change risks.

## Products and Technologies that Reduce CO<sub>2</sub> Emissions

### **S** ● **JNSF Core™—an Electrical Steel Sheet that Improves the Efficiency of Electrical Equipment**

Electrical steel sheets are widely used as core materials for electrical equipment such as motors and transformers and therefore play an important role in determining the performance of such electrical equipment. JFE Steel has developed a proprietary technology to soak silicon (Si) into steel sheets by utilizing chemical vapor disposition (CVD). This led the company to successfully develop and commercialize a new steel sheet, JNSF Core™, which is a compact and highly magnetic material with lower energy loss when in use.

The steel sheet significantly contributes to improving the efficiency of electrical equipment and downsizing them. It is widely used in equipment surrounding solar power generation.

JFE Steel was awarded the chairman's prize of National Commendation for Invention Awards 2019 in recognition of this achievement.



Electrical equipment used in solar power generation (reactor)

### ● **Ultra-narrow-gap J-STAR™—a High-weldability CO<sub>2</sub> Arc-welding Technology**

When assembling a box column using four steel plates, submerged arc welding\*<sup>1</sup> is typically used for welding the corners. However, the high heat input used can cause deformation.

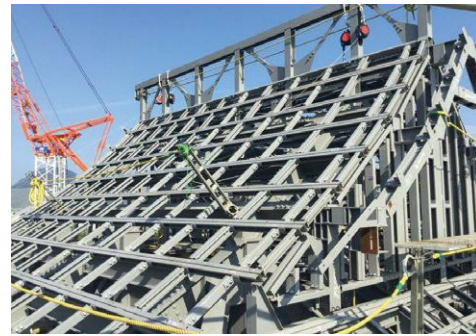
On the other hand, CO<sub>2</sub> arc welding\*<sup>2</sup> uses a lower heat input and therefore causes less deformation. Nevertheless, it is less efficient. JFE Steel improved this CO<sub>2</sub> arc welding and developed the Ultra-narrow-gap J-STAR™ Welding method, which achieves both high efficiency and low deformation. Its improved efficiency means that the welding process applying the method takes less time to complete and thus uses less CO<sub>2</sub>.

Characteristics of the welding method were considered highly suitable for the reconstruction of Kumamoto Castle, and Nagai Steel Co. used it to complete the assembly of the box columns then used

to construct the six-story of the castle tower.

\*1 A welding process that feeds the welding wire into areas spread with granular flux and generates an arc under the flux.

\*2 The most widely used and inexpensive gas shield arc welding, which uses 100% CO<sub>2</sub> for the shielding gas.



Steel construction of the six-story of the castle tower of Kumamoto Castle

### ● **Use of Granulated Blast Furnace Slag to Reduce CO<sub>2</sub> Emissions**

Granulated blast furnace slag in crushed and powdered form can be mixed with cement and used as a substitute for cement for making concrete. This leads to reducing the production of cement and hence lower CO<sub>2</sub> emissions. For example, producing one tonne of blast furnace slag cement with 45% of its content substituted with granulated blast furnace slag emits 41% less CO<sub>2</sub> than conventional cement. By FY2018, JFE Steel had supplied approximately 6.4 million tonnes of granulated blast furnace slag to cement production, equivalent to a reduction of approximately 4.5 million tonnes of CO<sub>2</sub> emissions.

In addition, studies have shown that using blast furnace slag as a substitute for the natural sand in concrete improves its mechanical property. There is a growing interest in the practical applications of this property as potential new technologies that strengthen the nation.



Example of precast, which uses granulated blast furnace slag cement

### ■ **CO<sub>2</sub> Emission for Producing 1 Tonne of Cement** (Unit: kg-CO<sub>2</sub>)

CO <sub>2</sub> Emission Source	Regular Cement	Blast Furnace Slag Cement
Limestone	473	272
Electricity	311	190
<b>Total</b>	<b>784</b>	<b>463</b>

### Regional Electricity Retail Businesses in Partnership with the Local Municipal Governments

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

It sources its electricity from waste-fueled and other renewable-energy power generation plants that it has built and distributes the electricity to local areas and public facilities, thus promoting local production and consumption of electricity.

Through these regional electricity businesses, JFE Engineering intends to promote renewable energy, reduce electricity cost for public facilities, and expand the region's industrial infrastructure.

The regional electricity companies JFE Engineering has established in partnership with the municipal government are Smart Energy Iwata in Iwata city, Shizuoka Prefecture; Tokorozawa Mirai Electricity in Tokorozawa City, Saitama Prefecture; Fukuyama Mirai Energy in Fukuyama City, Hiroshima Prefecture; and Smart Energy Kumamoto in Kumamoto City, Kumamoto Prefecture. The company, through each regional electricity company, works on tailoring its electricity distribution business to the most suitable and effective level for every region, thereby creating sustainable regional societies.



Commencement of regional electricity business ceremony



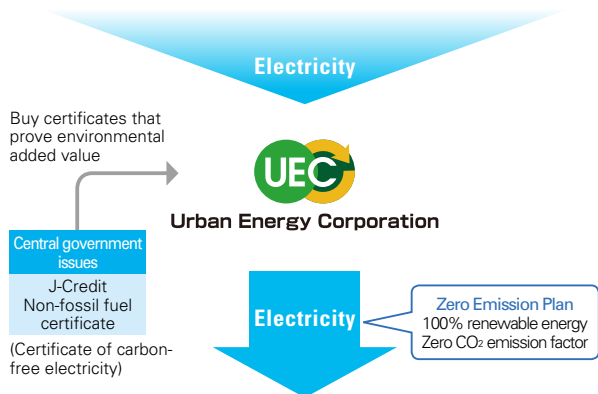
New West Environment Plan in Kumamoto

### Promotion of Renewable Energy

JFE Engineering has established an array of electrical power generation plants that use renewable sources such as waste, biomass, solar, and geothermal and has been commissioned to manage their operations. Through its subsidiary Urban Energy Corporation, it is also involved in the retail electricity business using the electricity generated by these plants as the source.

More corporations have become more environmentally aware in recent years. In response, Urban Energy Corporation introduced the special electricity tariff Zero Emission Plan in July 2018 for corporations and organizations, which supplies them with 100% renewable energy.

#### ■ Renewable Energy that the Urban Energy Corporation Supplies (Including Those within the Scope of the FIT Scheme)

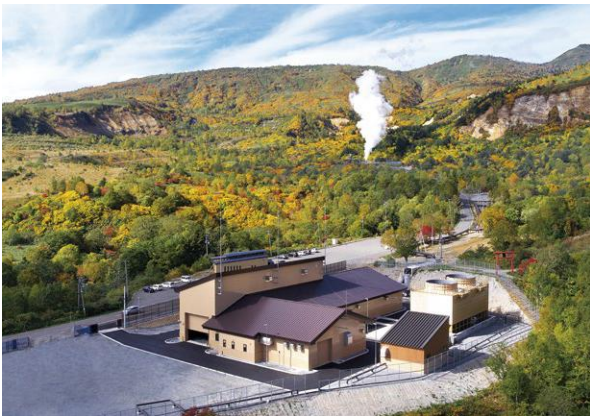


IKEA Tachikawa—a business that focuses on environmental added value

● **Matsuohachimantai Geothermal Power Plant Now in Operation**

In January 2019, Iwate Geothermal Power Co., Ltd. began full operations of its geothermal power generation plant in Matsuohachimantai City, Iwate Prefecture. This was the first time in 22 years that a geothermal power plant with an output higher than 7,000 kW started operating in the country. Historically, steam production facilities and power generation facilities were constructed independently. However, for this plant, JFE Engineering was contracted to construct both facilities, considering the economic benefits and quicker turnaround time to production.

The generated electricity is sold to Tohoku Electricity under the FIT-scheme and resold to Urban Energy Corporation (100% subsidiary of JFE Engineering) as the agreed retailer for this source, which is actively involved in renewable energy and its promotion.



Matsuohachimantai Geothermal Power Plant operated by Iwate Geothermal Power Co., Ltd.

● **Biomass Fuel**

In response to growing demand for biomass fuels by biomass power generation companies, JFE Shoji Trade imports palm kernel shells to Japan from Malaysia and India.

In addition, as the trend toward reducing CO<sub>2</sub> emissions accelerates, demand for renewable energy is rising, especially for biomass power generation not affected by weather conditions. We will respond to this demand by exploring other types of biomass fuels, such as wood pellets, to ensure a stable supply of biomass fuels.

Wood pellets are a biomass fuel that allows for the effective reuse of wood materials from thinning and pruning forests or waste materials from woodworking operations.

Wood pellets are considered to be ideal as a biomass fuel for renewable energy since the CO<sub>2</sub> emitted by burning them is offset by the CO<sub>2</sub> absorbed during tree growth.

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

■ **Shipping Bases for Palm Kernel Shells**





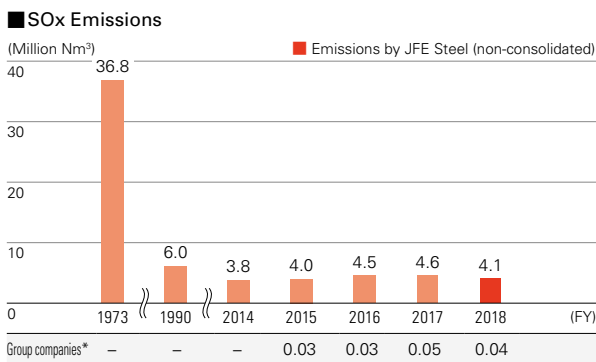
# Protecting the Global Atmosphere and Water

## Basic Approach

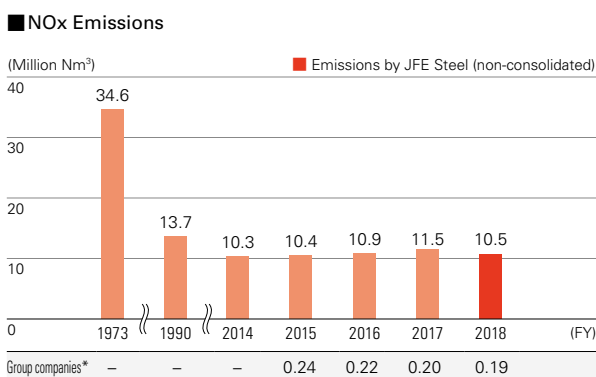
The JFE Group regards co-existence and mutual prosperity with local communities, the global environment, and society at large as a critical managerial challenge in terms of business continuity. It strives to control air and water pollutant emissions and aggressively invests in environmental protection.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

## Controlling Air Emissions

JFE Steel is controlling emissions by installing low-nitrogen oxides (NOx) burners in reheat furnaces, switching to low-sulfur fuels and deploying desulfurization and denitration devices in sintering plants, all major sources of sulfur oxides (SOx) and NOx emissions.



\*13 JFE Steel consolidated subsidiaries in Japan.



\*13 JFE Steel consolidated subsidiaries in Japan.

In addition, the company suppresses dust dispersion through measures that include enhancing on-site cleaning, installing sprinklers and windbreak fences in raw material yards, and improving the performance of dust collectors.

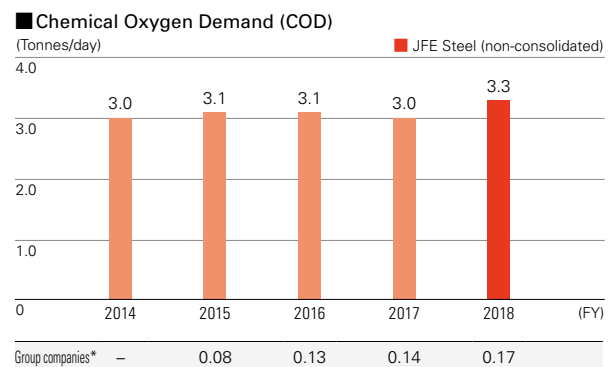
To ensure compliance with the Air Pollution Control Law and relevant local regulations, JFE Engineering properly manages facilities that emit soot and smoke, by regularly measuring NOx emissions, etc., at its Yokohama head office, Turumi works, and Tsu works.

In addition, efforts are being made at construction sites to protect the environment through the use of construction machinery and on-site vehicles in compliance with the Automotive NOx and PM Law and Off-Road Vehicle Law.

## Preventing Water Pollution

JFE Steel strives to reduce its environmental impact on waterways by thoroughly purifying water used in iron and steelmaking processes before releasing it into public waterways or sewers. The company has concluded agreements with the administrative entity in each area that set out more rigorous effluent standards, compared to those stipulated under the Water Pollution Prevention Act. It also established a strict voluntary control standard to improve water quality.

For FY2018, chemical oxygen demand (COD), the water-quality index for wastewater, was 3.3 tonnes per day.

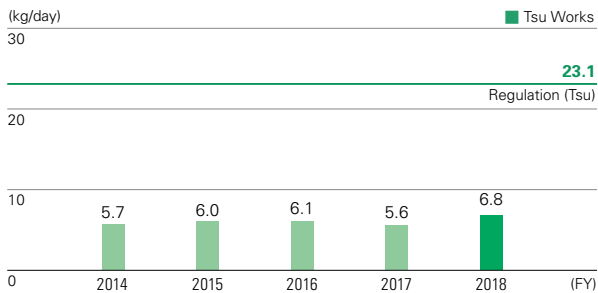


\*12 JFE Steel consolidated subsidiaries in Japan.

Wastewater from the JFE Engineering Yokohama head office, Tsurumi works, and Tsu works, is released into public waterways or sewer systems. Nitric oxide, phosphorus, and COD in the

wastewater are measured on a regular basis and effectively managed in accordance with the Water Pollution Prevention Act and Sewerage Act.

#### Chemical Oxygen Demand (COD) in Wastewater Released Publicly



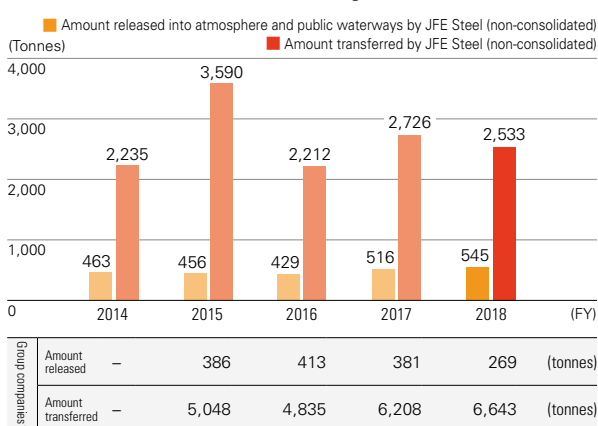
This report uses the maximum value of each year.

## Management of Chemical Substances and Emission Control

JFE Steel lowers its environmental impact by voluntarily reducing the chemical substances it releases. Release and transfer amounts of substances subject to Japan's Law concerning Pollutant Release and Transfer Register (PRTR Law) are reported in accordance with the law. In FY2018, chemical substances released into the atmosphere and public waterways totaled 545 tonnes.

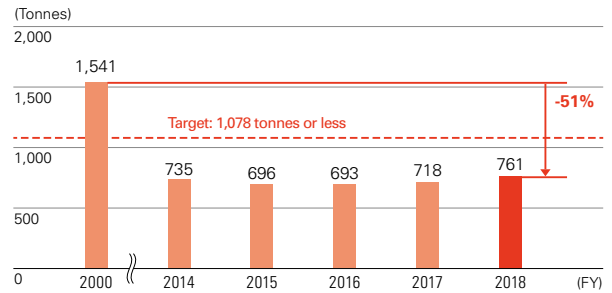
The Japan Iron and Steel Federation formulated a voluntary action plan to reduce VOC emissions by 30% from FY2000 levels by FY2010. As part of this action plan, JFE Steel set a target for reducing emissions to 1,078 tonnes or less. As a result of our initiatives, we achieved a significant reduction that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

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



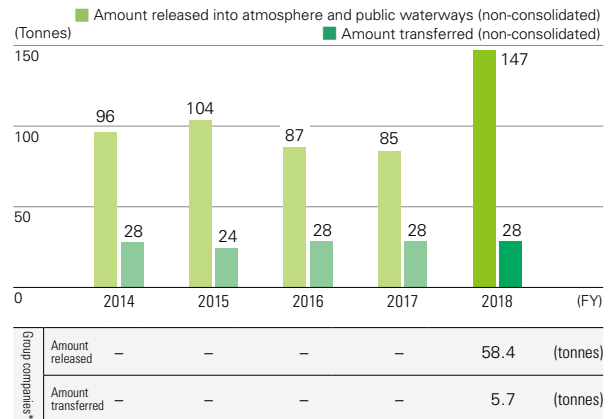
\*18 JFE Steel consolidated subsidiaries in Japan.

#### VOC Emissions



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

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



\*4 JFE Engineering consolidated subsidiaries in Japan.

#### PCB Waste Management at JFE

Polychlorinated biphenyl (PCB) waste is properly stored and managed at the JFE Group's facilities. High concentration PCB waste is treated in accordance with guidelines set by the Japan Environmental Storage & Safety Corporation (JESCO).

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

## Products and Technologies (Protecting the Environment)

### **E** Construction of a Wastewater Treatment Facility in Vietnam

As developing countries undergo rapid economic growth and urbanization, improvement of their wastewater treatment facilities is becoming urgent to address the increasing pollution of rivers from household wastewater.

In FY2018, JFE Engineering received an offer from Hanoi City, Vietnam for the Yen Xa wastewater treatment plant, which is to have the largest treatment capacity in Hanoi (treatment capacity of 270,000 m<sup>3</sup>/day, 900,000 population equivalent). Advanced Japanese technologies will be fully incorporated into the facility, including high rate filtration technology and the advanced treatment process that efficiently removes nitrogen and phosphorus from wastewater, realizing the export of high-quality infrastructure.

Leveraging its past experiences in constructing wastewater treatment facilities in Vietnam, JFE Engineering will further strengthen cooperation with local companies to offer Japanese technologies and know-how while contributing to improvements in the living environment of Vietnam.

1. Client: Hanoi City, Socialist Republic of Vietnam
2. Location of construction: Thanh Tri District, Hanoi
3. Scope of work: Construction of wastewater treatment plant
4. Contract amount: 10 billion yen (approximate, portion contracted by JFE Engineering)
5. Construction period: Scheduled to be completed by FY2022



Rendering of the Yen Xa sewage treatment plant in Hanoi

### Waste Incinerator that Uses a Counter Current Combustion Method

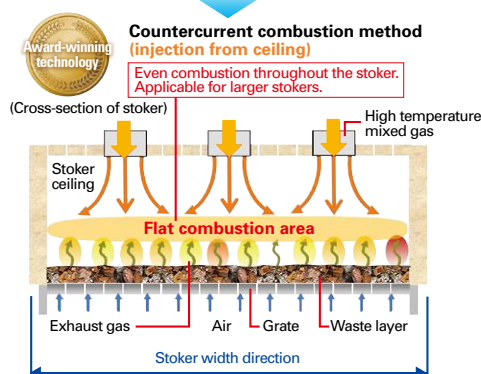
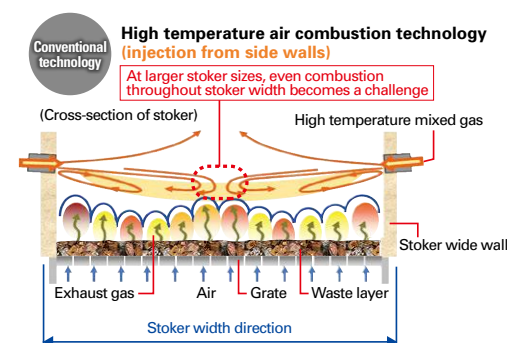
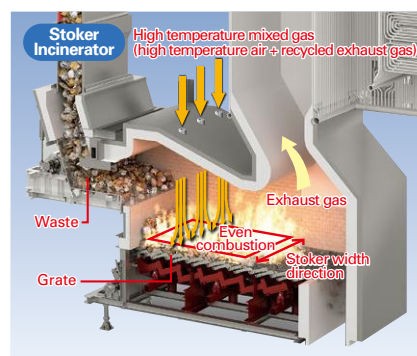
Massive demand for waste incinerators has recently emerged to cope with such concerns as reducing environmental impact, improving the efficiency of electricity generation, and lowering operational costs.

JFE Engineering became the first in the world to adopt the counter current combustion method, developed by deriving from high temperature air combustion technology,

for waste incinerators, and it successfully reduced NOx concentration in exhaust gas by 20% to 30%, compared to the conventional method, while maintaining the same carbon monoxide (CO) concentration level. This eliminates the need for equipment to reduce the NOx concentration in exhaust gas and makes possible a more compact facility requiring less maintenance. In addition, the steam that had previously been consumed by denitration equipment can now be fed to turbines to generate electricity.

“Waste Incinerator that uses a counter current combustion method” won the Minister of Economy, Trade and Industry Prize in the 44th Excellent Environmental Equipment Award, sponsored by The Japan Society of Industrial Machinery Manufacturers.

#### Waste Incinerator that Uses a Counter Current Combustion Method



# Initiatives to Preserve Biodiversity

## Basic Approach

The JFE Group recognizes biodiversity preservation as a key challenge and conducts assessments to minimize the ecological impact from business activity. Our initiatives include cooperating with the community to monitor biodiversity and carry out preservation activities in order to minimize ecological impact around the steelworks, as key facilities for our business, and in surrounding areas. It also involves developing iron and steelmaking slag products that can help restore the marine environment. Furthermore, outside of our business operations, we launched a joint research program with the local government and are conducting environment-related training for local communities.

## Initiatives to Preserve Biodiversity

The JFE Group engages with members of the community in activities to preserve biodiversity.

**S Environmental Impact Assessment**  
To minimize the ecological impact of our business activities on surrounding areas, we are monitoring biodiversity around all of our business sites and planting trees while also preserving rare species in the compound.

An environmental impact assessment is conducted in accordance with laws and regulations before launching construction of a new manufacturing site or business. We assess the biodiversity of the surrounding areas as well as our premises to fully understand the situation and to implement the necessary measures for preserving the ecosystem.

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

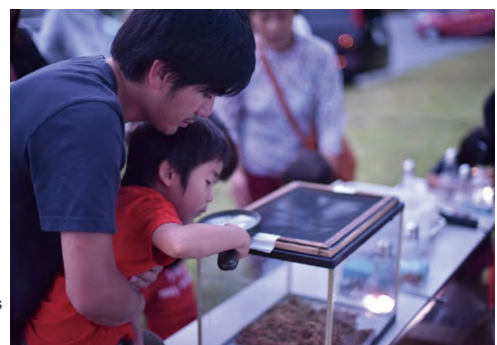
We conducted an environmental prediction and evaluation for the renovation of an aging facility, Plant No. 1 in the JFE Ohgishima Thermal Power Plant, in accordance with the Environmental Impact Assessment Act and Electricity Business Act. As a result, the Kugenuma orchid, a plant listed in Japan's Ministry of Environment Red List 2017 as an endangered species, was discovered at the planned construction site for power generation facilities. To preserve the orchids, we replanted them in a different location of the site that had a similar environment.



Kugenuma orchid

### Firefly Festival

JFE Steel has opened its Environment Pond at the Chita Works to the community for a firefly festival every year since 2014. Children at the event have the opportunity to release fireflies.



Participants observing fireflies

### Initiatives in Relation to Construction Works

For large-scale construction or construction work carried out near watersheds or mountainsides, customers and/or the relevant authorities may conduct preliminary investigations depending on the importance of preserving the surrounding environment. Various preservation conditions may then be required, including the protection of living creatures.

In an example of how JFE Engineering has responded to such requirements, the company proposed a construction method that minimizes the impact of noise or drainage pollution on biodiversity. We respect the proposed conditions and thoughtfully consider biodiversity preservation by keeping the impact of construction works at a minimum.

The condition of biodiversity in areas surrounding the steelworks or its premises are checked, and necessary measures are taken to ensure preservation.

● **Biotope for the Children’s Learning Experience**

Since 2009, JFE Engineering has been inviting children in the community to learn about the ecosystem at a biotope, Dragonfly Pond, along the JFE Dragonfly Path in the Tsurumi Works.

In 2018, the JFE Dragonfly Path Fan Club, a group mainly composed of neighborhood residents, organized a research event that involved capturing dragonflies in order to learn about their ecology and the local environment. Furthermore, an organization dedicated to dragonflies, composed of members from businesses, residents, administrations, and professionals, is conducting a habitat study to help improve the quality of a green space along the Keihin coastal areas as well as to support biodiversity. The organization captures dragonflies that gather around the biotope and tags them for follow-up surveys.

● **JFE 21st Century Foundation**

The JFE 21st Century Foundation cosponsors the dragonfly organization as part of its activities to support cultural development.

▶▶ P. 66 **JFE 21st Century Foundation**

## Endorsing and Participating in External Initiatives

As a member of the Keidanren Committee on Nature Conservation, the JFE Group actively engages in the conservation of nature and biodiversity.

Furthermore, the Group participates in the Japan Business and Biodiversity Partnership and exchanges information with various parties, including NGOs, researchers, and public agencies.

## Products and Technologies (Preserving Biodiversity)

● **Restoring Marine Ecosystems Using Steel Slag Products**

Marine Stone™, a gravel-type steel slag product, is a habitat forming material that suppresses hydrogen sulfide, which arises from an unhealthy seabed and improves water and sediment quality in enclosed coastal waters.

Its effectiveness in improving marine environments has been widely recognized, and the joint project with Hiroshima University received the Minister’s Prize (Ministry of Agriculture, Forestry and Fisheries) in the 12th Eco Products Awards and the Grand Prize in the 26th Nikkei Global Environmental Technology Award.

Hiroshima Prefecture has used a total of 38,000 tonnes of Marine Stone™ in its Fukuyama Port Marine Environment Creation Project (inner harbor area). Its marine environment improvement property was confirmed to still be effective in 2019, four years after its initial placement.

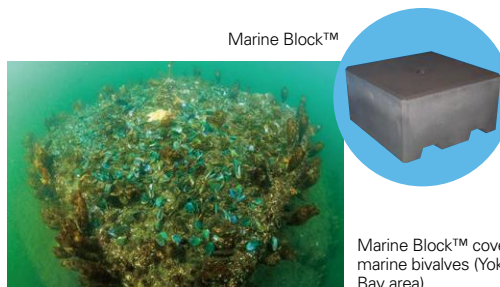


Inner harbor area of Fukuyama Port, Hiroshima Prefecture, where Marine Stone™ is laid out, at low tide. The entire area is covered by seaweed.

● **Contributing to the Creation of an Attractive Seaside Town by Utilizing Steel Slag Products**

In a joint research project\* with the City of Yokohama, JFE Steel has confirmed that steel slag products, including Marine Block™, which is steel slag absorbing CO<sub>2</sub> gas, provide a highly effective base for nurturing and growing sea organisms while also facilitating the natural cleansing of seabeds and seawater. We will continue to work on this project with the City of Yokohama toward improving the marine environment in Yokohama Bay and developing an attractive seaside town.

\*Joint research related to research on techniques to improve a marine life environment and facilitate the natural cleansing ability of seawater near the shores of Yamashita Park.



Marine Block™ covered by marine bivalves (Yokohama Bay area)

# Resource Recycling

## Basic Approach

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

## Promoting Resource Recycling

Each operating company of the JFE Group carries out resource recycling suited to its particular business. We continue to pursue increasingly efficient uses of resources in both the production and product/service phases of its businesses, including steel scrap recycling, biomass fuel production and waste-to-energy power generation.

## Efficient Use of Water in Response to Water Risks

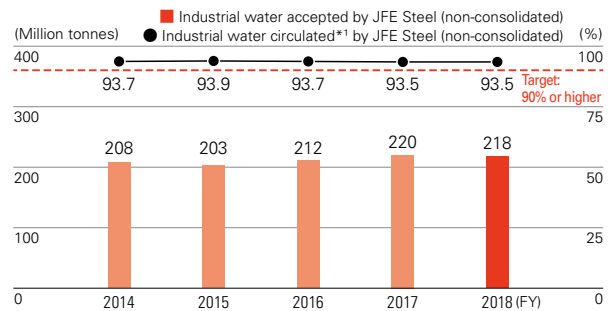
**Water-related Risks and Mitigation**  
 JFE Steel identifies and evaluates water-related risks such as drought and flooding based on damage reported in the past for each steelworks and on forecast data from the Meteorological Agency. Using tools such as the World Resource Institute (WRI)'s Aqueduct, these risks are further evaluated from different perspectives. While Japan possesses a plentiful water supply, there are risks of water shortages and flooding associated with climate conditions. JFE Steel identifies steelworks having risks that are affected by climate change and mitigates their risks by creating a BCP.

### Cyclic Use of Water

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

successfully achieving the target. Our recycling rate of industrial water in FY2018 maintained a high level of 93.5%.

### Industrial Water Accepted/Circulated



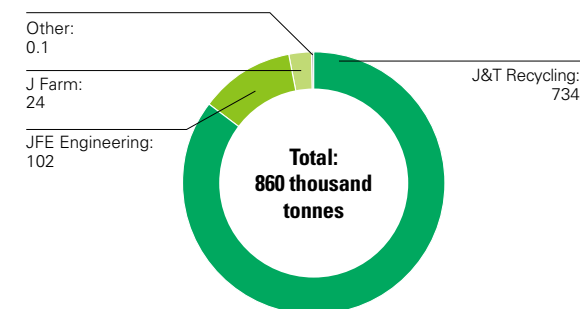
JFE Steel						
Total amount	3,313	3,326	3,340	3,410	3,376	(Million tonnes)
Industrial water accepted	208	203	212	220	218	(Million tonnes)
Group companies*2						
Total amount used	-	-	339	280	289	(Million tonnes)
Amount of industrial water accepted	-	25	26	21	20	(Million tonnes)

\*1 Industrial water circulated (%) = (Total amount - industrial water accepted) / total amount used × 100  
 \*2 25 JFE Steel consolidated subsidiaries in Japan.

## Water Consumption

JFE Engineering and its subsidiaries strive to efficiently use water in their business operations at each site.

### JFE Engineering Group's Water Consumption for FY2018

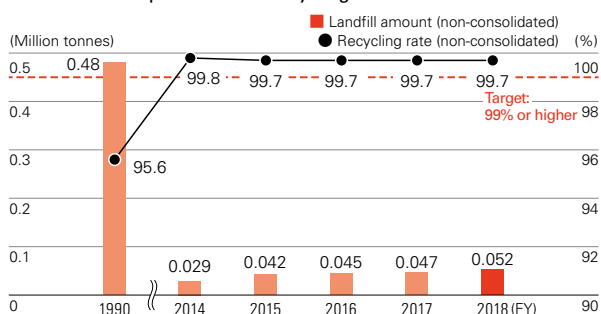


Data cover JFE Engineering and 7 consolidated subsidiaries in Japan.

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

**S** JFE Steel carefully controls the generation and emission of iron and steelmaking slag (co-product), iron dust from blast furnaces and converters, sludge from water treatment facilities, and other co-products. The target rate for recycling is 99% or more. Dust and sludge with high iron content are recycled as raw materials for steelmaking. Iron and steelmaking slag is effectively recycled for reuse in cement and other construction materials. We are also promoting their use as environment recovery material such as Marine Stone™, which works effectively as a base for the adhesion of organisms and for improving the marine environment. As a result of such efforts, the company achieved a 99.7% recycling rate for slag, dust, and sludge in FY2018, consistently maintaining the target of 99% or higher.

### Landfill of Co-products and Recycling Rates



Group companies*	1990	2014	2015	2016	2017	2018 (FY)	(Million tonnes)
Recycling rate	-	-	0.771	0.776	0.539	0.792	(%)
Landfill amount	-	-	0.042	0.034	0.029	-	(Million tonnes)

\*25 JFE Steel consolidated subsidiaries in Japan.

## Promoting Recycling

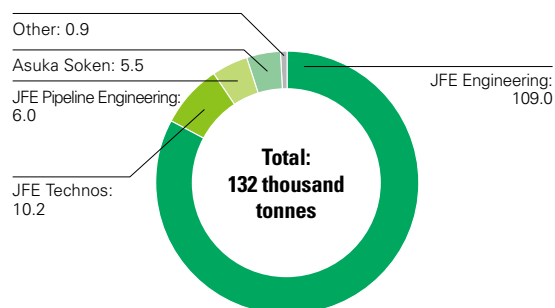
**E** Most of JFE Engineering's industrial waste is rubble and sludge discharged from construction sites. By separating these wastes on-site and then employing disposal companies known for achieving high recycling rates, the construction department limited its industrial waste to 109 thousand tonnes, a recycling rate of 98.4%, in FY2018.

Company production sites focus on improving recycling rates by thoroughly separating valuable co-products and waste. In FY2018, the Tsurumi Works recycled 506.6 tonnes of waste and the Tsu Works recycled 532.7 tonnes, achieving the recycle rates of

68.7% and 32.1%, respectively.

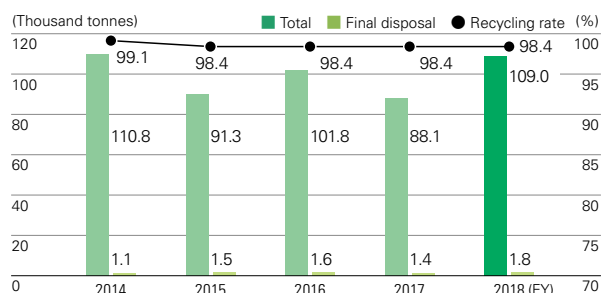
The City of Yokohama has named JFE Engineering's Yokohama head office as a Workplace with Excellent 3R Activities for seven consecutive years beginning in FY2012 to recognize its waste reduction, reuse, and recycling activities.

### JFE Engineering Group Waste Disposal for FY2018



Data cover JFE Engineering and 9 consolidated subsidiaries in Japan.

### Waste Generated at Construction Sites



## Products and Technologies (Resource Recycling)

### ● Precast Concrete Products Mixed with Finely Ground Blast Furnace Slag

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

As one of the deliverables for the Japanese government's Strategic Innovation Promotion Program (SIP), the Japan Society of Civil Engineers published a draft guideline in March 2019 on the application of finely ground

blast furnace slag to precast concrete products.

With the application of finely ground blast furnace slag in concrete, the durability of precast products is expected to be greater and more consistent, allowing them to contribute to building a stronger nation.



Precast concrete products for extending road width

**T** Every JFE Shoji Trade office reduces and recycles waste by using waste paper and thoroughly separating waste. The company's recycling business for steel and aluminum scrap includes the export of steel scrap to Asian countries, where it is sold for both offshore and domestic trading. Although steel scrap exported from Japan is mainly transported by bulk carriers, timely shipments of small lots now contribute to emerging recycling societies in Asia due to the container loading system introduced by JFE Shoji Trade.

## Resource Recycling Solutions

The JFE Group is involved in establishing a recycling-oriented society through a variety of initiatives.

Steelworks promotes the efficient use of raw materials, water, and other resources in the process of iron and steelmaking in addition to encouraging the application of recycled resources such as used plastics for blast furnaces.

Moreover, we are striving to more efficiently use co-products generated in the iron and steelmaking process through initiatives such as the international recycling of steel scrap.

In the engineering field, in addition to constructing and providing customers with waste incineration plants and plants for treating sludge, we are developing a waste recycling business and an energy supply business to offer resource recycling solutions.

### Initiatives for Resource Recycling Solutions

#### Resource Recycling Solutions

##### Solution 1

##### Promoting the use of recycled resources

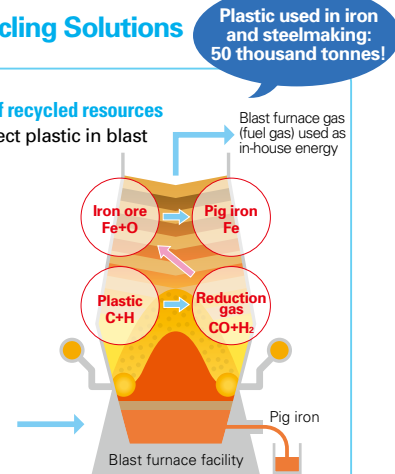
- Technology to inject plastic in blast furnaces



Used plastic



Pulverized plastic



On-site recycling rate of industrial waste: 98.4%!

### Initiatives for Realizing a Recycling-oriented Society

##### Initiative 1

#### Construction and operation of plants

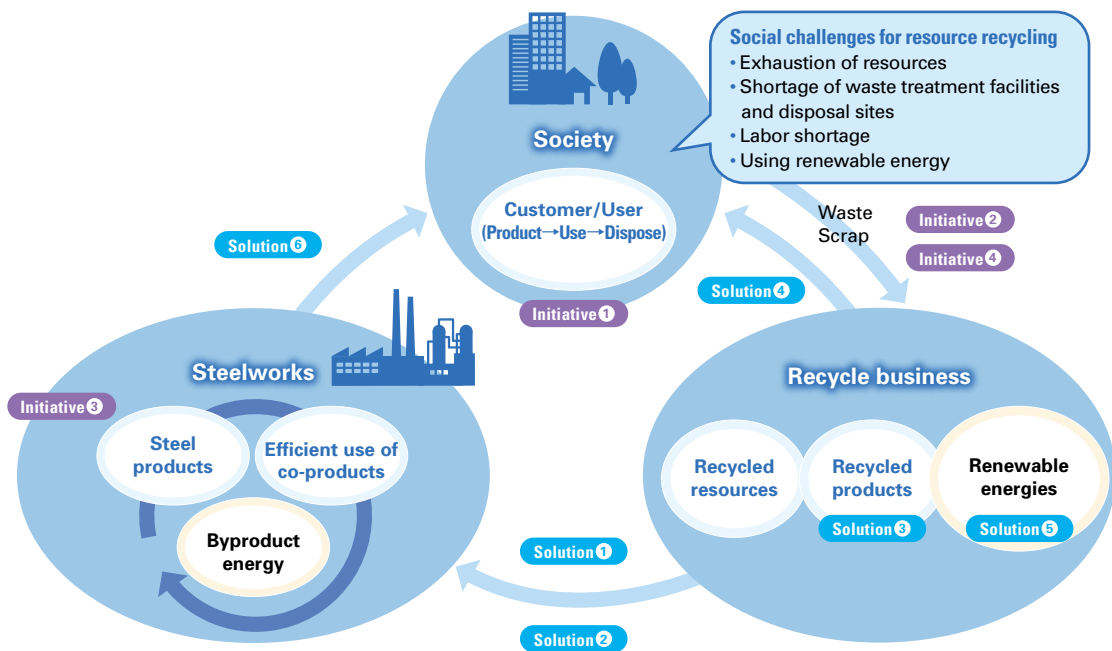
Construction and support for the optimal operation of waste plants and sewage treatment plants; actively promote the recycling of industrial waste generated at construction sites and plants.

##### Initiative 2

#### Recycling/power generation business

Engaging in a power generation business using heat and gas produced when treating wastes.





**Social challenges for resource recycling**

- Exhaustion of resources
- Shortage of waste treatment facilities and disposal sites
- Labor shortage
- Using renewable energy

Accumulated amount recovered at JFE Bars & Shapes: 50 thousand tonnes!

**Solution 2**

**Recycling resources**

- Recycling used batteries through an electric furnace to separate metals such as iron, manganese, and zinc

**Solution 3**

**Offering recycled products**

- Recycled plastic products such as palettes and NF boards

**Solution 4**

**Recycle**

- Recycling fluorescent lights, batteries, home electronic appliances, etc. (treating hazardous materials for recycling)

**Solution 5**

**Using renewable energy sources**

- Waste power generation, biomass power generation
- Recycling food waste, biogas generation from sludge

**Solution 6**

**Efficient use of co-products**

- For cement material, etc.

Water recycling rate: 93.5%!  
Rate of efficient use of co-products: 99.7%!

**Initiative 3**

**Improving the iron and steelmaking process**

In the iron and steelmaking process, promote the efficient use of raw materials and water resources, reduced generation and emission of co-products and reuse of co-products, and use of recycled resources and recycling of resources.

**Initiative 4**

**Global circulation of scrap**

Contributing to the expansion of a recycling-oriented society at a global scale by efficiently recovering and transporting iron scrap.

**Shared initiative**

**Develop resource recycling technologies and products**

Develop technologies and products that efficiently use co-products generated in the Group's production process as well as wastes generated during social activities.

**Collaboration with administrative entities**

Established a new local-based power company in collaboration with an administration to promote the local generation and local consumption of electricity through waste power generation, etc.

# Environmental Communication

The JFE Group gives utmost priority to communicating with all stakeholders, including in matters relating to the environment.

## Disclosing Environmental Data

The East Japan Works of JFE Steel discloses real-time environmental data on local air and water quality. Visitors can review this information in the first-floor lobby of the Visitor Center in the Chiba District and in the Amenity Hall and the first-floor lobby of the Keihin Building in the Keihin District.



Environmental data display in the Keihin District

## Disclosure and Exchange of Information

### “ecobeing” Environmental Website

The JFE Group cooperates with the “ecobeing” environmental website, which helps to broaden awareness of eco-activities. One of the tabs on the website called “ecopeople” contains a series of articles featuring persons from different fields.

**Web** [ecobeing \(Japanese only\) → http://www.ecobeing.net/](http://www.ecobeing.net/)

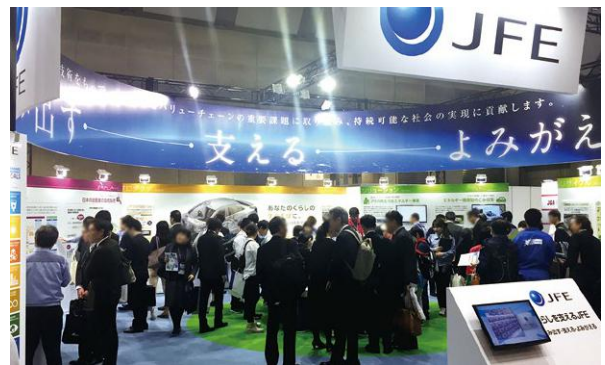
### Sponsoring “Midori no Komichi” Environmental Diary

The JFE Group sponsors the “Midori no Komichi (Green Trail)” environmental diary project hosted by Green Cross Japan with the hope that children will become more aware of environmental issues by keeping diaries of their activities and thoughts about ecology.

**Web** [“Midori no Komichi” Environmental Diary \(Japanese only\) → http://www.midorinokomichi.net/](http://www.midorinokomichi.net/)

### Environmental Exhibition—EcoPro 2018

The JFE Group exhibited its environmentally friendly products and technologies at EcoPro 2018, Japan’s largest environmental exhibition, in December 2018. The booth’s theme was “JFE-Supporting People’s Life: Create, Support and Reborn.” In addition, the company supported Green Cross Japan by running tours for children, called the EcoPro EcoKids Tour.



Many people stopped by the JFE Group’s exhibition booth throughout the period



Children deeply interested in diorama



Coral and tropical fish around Marine Block™ (iron and steelmaking slag) attracts visitors every year.

# Contributing to Societal Development

JFE Group CSR Report 2019

# Customers

## JFE Standards of Business Conduct (Excerpt)


### (1) Provide quality products and services

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

## Quality Initiatives


The JFE Group manages quality by ensuring compliance with quality standards set by each operating company. All manufacturing sites that require ISO 9001 certification for their quality management have been duly certified.

## Strengthening Quality Assurance System

 To serve customers by meeting their quality requirements and delivering products that boast the world's highest quality, JFE Steel has established a quality assurance system with advanced sensors for process monitoring, in addition to its ongoing efforts to develop new products and advanced manufacturing technologies.

The company's quality assurance system is being continually improved based on the Guidelines for Enhancing Quality Assurance Systems, issued by the Japan Iron and Steel Foundation (JISF). Moreover, in an effort to enhance reliability in its product testing, the company has introduced high-precision equipment and is working to thoroughly eliminate human error and data tampering by automating various testing components, including reporting.

JFE Steel has received all quality assurance certifications required for steel products, including the JIS mark and approvals from ship classification bodies, regarding its quality management system based on ISO 9001. In response to customer demand, the company has also received certification under the national standards of relevant foreign countries.


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

services.

For example, certified inspectors conduct inspections at each phase of a plant construction project, including the design, construction and test-run phases. Immediately prior to final delivery to the customer, a witness inspection is conducted so that the customer can be directly assured of its quality with their own eyes.


In addition, JFE Engineering has published quality-management manuals based on the specific characteristics of each product and obtained ISO 9001 certification for each product category.

To further strengthen its quality assurance system, JFE Engineering is raising employee awareness through training while also seeking to prevent omissions in inspection data and data tampering by introducing an electronic document processing system into quality inspections.

 JFE Shoji Trade is constantly striving to enhance its quality assurance through quality management. Its processing centers in Japan and abroad are systematizing and automating operations to eliminate human errors. Raising employee awareness is essential for preventing human error at every stage, including receiving orders, issuing work orders and shipping. The company continues to strengthen quality education for employees by introducing case studies of non-conformance at other companies as well as Group companies in Japan and abroad.

JFE Shoji Trade also recognizes that improving and maintaining the standard of control in product processing are the key to assuring quality. Accordingly, it implements a quality audit at all relevant Group companies in and outside of Japan at least once a year to confirm the quality of each processing center and to provide advice. Moreover, the company follows up as necessary by continuously monitoring the progress of improvements to maintain and enhance quality.

## Ensuring Stable Supply

 Under its Sixth Medium-term Business Plan, JFE Steel is continuously strengthening its manufacturing base while also seeking to bolster the capabilities of the West Japan Works by increasing its capacity and maximizing performance. In addition to making strategic investments that exceed the Fifth Medium-term Business Plan and upgrading old facilities, the company is establishing a system for

promoting stable furnace operations and introducing technologies and facilities for detecting abnormalities at an early stage of operation. Through these activities JFE Steel will realize stable facility operations and production to continue providing high-quality products to customers.

**E** As a licensed contractor undertaking mechanical, civil engineering, and construction work, JFE Engineering is required by the Construction Business Act to assign dedicated managing engineers at construction sites to oversee the technical aspects of construction work. The smooth implementation of plant construction projects depends on licensed specialists. The company is always striving to secure the necessary human resources by encouraging employees to acquire qualifications by granting expenses and through mid-career hiring of licensed personnel.

**T** Recognizing that processing and distribution operations represent the key for ensuring stable supply, JFE Shoji Trade is committed to investment in strengthening these operations.

## Improving Customer Satisfaction

### **S** ● Integration of a Maintenance System for Steel Manufacturing Plants and Use of Advanced ICT (AI)

Problems in steel manufacturing plants can result in lost opportunities for production and shipping, and any interruption in the supply chain can also considerably impact customer businesses.

To ensure the prompt recovery from malfunctions, JFE Steel has created a database that integrates massive information from manuals along with the knowledge and experience of veteran employees. By incorporating AI technology with the database, the company introduced the control recovery support system called J-mAlster™\* in 2017, a first in the Japanese steel industry. The system enables maintenance staff to efficiently search for the information required for repairs and was deployed throughout the manufacturing line in FY2018.

JFE Steel will continue to deploy advanced ICT effectively in order to ensure the stable supply of steel products.

\*JFE Maintenance AI of Smart TPM for Electric Repairs

### ● Testing and Research Centers for Collaboration with Customers on Product Development

JFE Steel collaborates with customers in research and development. The Customers' Solutions Lab (CSL) for auto industry customers and the Steel Structural Materials Solutions Center (THiNK SMART) for infrastructure-related customers are located in eastern Japan, while the Customer Center Fukuyama (CCF), which develops materials and conducts applied technology research, is in western Japan. Using these facilities to strengthen early vendor involvement (EVI)\* enables the company to develop products that reflect an accurate understanding of customer needs, cutting-edge evaluation techniques and innovative production processes.

\*Customer participation in product development is from an early stage to facilitate innovative new methods, functions, processes and evaluations for new steel materials.



Customers' Solutions Lab (CSL)

### ● Unified Customer Care

JFE Steel regularly conducts customer questionnaires and interviews to draft strategies for greater customer satisfaction. Business strategies are shared among the sales divisions, business sectors, steelworks, and research divisions to facilitate unified customer care and proposals that leverage the collective strengths of the JFE Group.

### ● Training Sales Personnel to Excel in Customer Relations

To strengthen customer-oriented sales efforts, the Sales Department holds training sessions by position and job, according to their work experience, targeting sales personnel from the headquarters and branch offices (i.e., newly appointed sales employees, mid-rank sales employees and office heads). The department also provides group training in Japan for regional employees of overseas offices to enhance job performance. Training goals include developing abilities in areas such as engaging in technical conversations, picking up clues from customer relations and using them in product development, offering suggestions to improve logistics and distribution, and analyzing financial indicators and costs.



### ● Company Assessments Based on Customer Evaluations

JFE Engineering uses customer surveys, interviews, and contractor performance evaluation forms to collect and assess data on the company's construction management, product quality, advanced technologies and innovation. Each division analyzes and applies the data for quality improvement, new product development and the overall strengthening of after-sales service, to ultimately enhance customer satisfaction.



### ● Meeting Customer Needs

To respond quickly to diversifying markets and increasingly sophisticated requests from customers, JFE Shoji Trade is strengthening its entire supply chain from materials procurement to processing and distribution.

The company is also aware that equipping employees to respond with information and proposals is a key element in serving customer needs and provides training to upgrade their abilities. Furthermore, selected regional employees of overseas subsidiaries and offices receive group training in Japan to strengthen the satisfaction of the company's customers in Japan and overseas.

#### ■ JFE Shoji Trade Training Programs (FY2018)

Training	Participants
Technical Presentation by Overseas Group Companies	34
National Staff (NS) Training	32

## Responsible Export Practices

Each JFE operating company promotes international peace and security by working against the spread of weapons of mass destruction and excess accumulation of conventional weapons. Specifically, the company carries out inspections to confirm the final destinations, customers and applications of its exported products, and then ensures that export procedures are carried out properly. In addition, the Legal Affairs Department conducts internal briefings to disseminate knowledge of export-related laws and regulations, such as the Foreign Exchange and Foreign Trade Act. Also, JFE provides education on export security controls and related measures for the employees of Group companies involved in trading.

## Promotion of Research and Development



JFE Steel views automobiles, infrastructure materials and energy as the three key areas for research and development. In each area, the company intends to accelerate the pace of introducing new products and solutions. In regard to its manufacturing process, the company will work on developing innovative manufacturing technologies such as eco-friendly raw material pre-processing. These technological developments leverage data science and robotics to closely align with the needs of customers and society at large. JFE Steel plans to invest 110 billion yen into research and development over the span of three years, starting in 2018.



JFE Engineering's "create" and "ni-na-u," the foundation for life, support and remain responsible for the foundation for life. In regard to "create," the company developed its own combustion technology for waste-treatment and power-generation facilities. The technology supports stable, clean incineration treatment and generates power at the highest level of efficiency in Japan. As for "ni-na-u," JFE Engineering continues to develop technologies that collect and analyze data from the various types of plants it operates in Japan as well as technologies that leverage AI to achieve optimal plant operation and automation.

## Internal Awards

The following technical and product developments were awarded in FY2018.

	Prize/Award	Project	Recipient
JFE Steel	Excellence Award, JFE Steel President's Awards	Development of coke oven refractory repair technology	Coke Technology Department and others
		Development of highly efficient combustion technology based on large-scale flow model	Plant Engineering Department, East Japan Works (Chiba District), and others
		Establishment of automation technology for high-efficiency cranes in thin coil storage	Process Department, West Japan Works, and others
JFE Engineering	Grand Prize, JFE Engineering President's Awards	Achievement of fully-automated operation of waste incineration furnace	Development Group, Environmental Solutions Sector, and others

# Suppliers

## Fair Competition and Trade

Compliant purchasing and procurement activities are critical to becoming a good business partner and nurturing the understanding and trust of suppliers. Each operating company of the JFE Group clearly defines its purchasing and procurement policies and discloses them to suppliers to request that they maintain the same high standards.

### Basic Policy on Procurement

JFE Steel upholds its Basic Policy on Procurement to conduct purchasing activities with fairness and sincerity and thereby continue earning supplier trust as a good business partner.

**Web** [Purchasing and Procurement Policies \(Japanese only\) →](https://www.jfe-steel.co.jp/company/purchase_policy/index.html)  
[https://www.jfe-steel.co.jp/company/purchase\\_policy/index.html](https://www.jfe-steel.co.jp/company/purchase_policy/index.html)

As for material procurement, the company has established the Raw Material Purchasing Policy to develop and operate a sustainable procurement system for sourcing raw materials. Through the system, JFE Steel pays due consideration to human rights, including the prohibition of child labor and forced labor, as well as legal compliance and environmental protection. In addition, the company purchases raw materials after confirming that suppliers are not using conflict minerals.

**Web** [Raw Material Purchasing Policy →](https://www.jfe-steel.co.jp/en/company/purchase_policy.html)  
[https://www.jfe-steel.co.jp/en/company/purchase\\_policy.html](https://www.jfe-steel.co.jp/en/company/purchase_policy.html)

### Requesting Suppliers to Promote CSR

JFE Steel believes that its social responsibility is to raise stakeholder satisfaction and enhance its corporate value. To that end, the company prioritizes efforts in areas such as environmental protection, safety, disaster prevention, and compliance, which are fundamental to its survival, and requests its suppliers to pursue their own CSR initiatives.

**Web** [CSR Procurement Guidelines \(Japanese only\) →](https://www.jfe-steel.co.jp/company/purchase_policy/index.html#to-our-business-partners)  
[https://www.jfe-steel.co.jp/company/purchase\\_policy/index.html#to-our-business-partners](https://www.jfe-steel.co.jp/company/purchase_policy/index.html#to-our-business-partners)

### Win-Win Relationships with Suppliers

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

### Fair and Sincere Procurement

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

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

**Web** [Purchasing and Procurement Policies \(Japanese only\) →](http://www.jfe-eng.co.jp/information/basic_policy.html)  
[http://www.jfe-eng.co.jp/information/basic\\_policy.html](http://www.jfe-eng.co.jp/information/basic_policy.html)

JFE Engineering requests that suppliers implement the following measures.

#### Requests to Suppliers Regarding CSR Initiatives

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

### Ensuring a Safe, Fair Supply Chain

Corporate social responsibility (CSR) is a pivotal element in JFE Shoji Trade's supply chain for the provision of products, functions and services through its global business. Customer demand for CSR-based procurement is increasing every year. In addition to its initiatives for quality, stable supply, safety and reasonable prices, the company is enhancing support for the global environment, human rights and occupational safety and health.

# Shareholders and Investors

## JFE Standards of Business Conduct (Excerpt)

### (2) Be open to society

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

## Returns to Shareholders

The JFE Group positions returns on shareholder investment as one of its top priorities. Profits are basically returned in the form of dividends.

The Group's basic policy under its Sixth Medium-term Business Plan is to strengthen the domestic profit base and expand overseas businesses and their profitability to achieve sustainable growth for the Group. In addition, the Group intends to maintain our payout ratio at about 30% by improving profitability and cash flow toward realizing the sound financial standing required for an A international credit rating.

## Proactive Information Disclosure

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

For individual investors, briefings are held at the branch offices of securities firms around Japan. The Group also distributes e-mails regarding IR information. Important press releases and Notices of the Ordinary General Meeting of Shareholders are provided in English for overseas investors.

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

**Web** [Disclosure Policy](https://www.jfe-holdings.co.jp/en/investor/management/disclosure-policy/index.html) →  
<https://www.jfe-holdings.co.jp/en/investor/management/disclosure-policy/index.html>

## Major IR Activities (FY2018)

Activity	Participants
Investor meetings	Approx. 500
Individual interviews with institutional investors and securities analysts	Approx. 400
Briefings for private investors at securities firms	Approx. 1,000 in 10 briefings

**Web** [Information for Shareholders and Investors](#) →  
**In Japanese:**  
<https://www.jfe-holdings.co.jp/investor/index.html>  
**In English:**  
<https://www.jfe-holdings.co.jp/en/investor/index.html>

## Enhancing Communication with Shareholders

JFE Holdings created its Investor Relations and Corporate Communications Department in April 2015 to facilitate more interactive communication with diverse stakeholders. The collection and dissemination of integrated information is being enhanced to provide management with more useful information for constructive dialogues with shareholders, including individual investors as well as domestic and foreign institutional investors. General meetings of shareholders are opportunities for dialogue with shareholders, so JFE sends invitations at the earliest possible date to maximize attendance and avoid overlapping with the shareholder meetings of other companies.

The company has been posting an invitation on its website at the earliest possible date while allowing online voting for shareholders who are unable to attend. Also, plant tours and company briefing sessions are organized to foster shareholder understanding of the JFE Group.

In FY2018, workplaces of JFE Steel, JFE Engineering and Japan Marine United held such events for about 2,100 shareholders. In FY2019, such activities will continue along with direct communication with shareholders to deepen their understanding of the JFE Group.



# Contributing to Societal Development

## Local Communities

### JFE Standards of Business Conduct (Excerpt)

#### (3) Work with communities

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

### Local Activities

#### ● Host Communities

Every year, the JFE Group opens its manufacturing facilities to residents in local host communities for demonstrations, tours and other events.

#### ■ On-site Events in FY2018

Location	Event	Date	Attendees
East Japan Works, Keihin	Keihin Community Festival	May 26	46,000
East Japan Works, Chiba	JFE Chiba Festival	October 28	40,000
West Japan Works, Fukuyama	JFE West Japan Festival in Fukuyama	May 13	59,000
West Japan Works, Kurashiki	JFE West Japan Festival in Kurashiki	November 3	110,000
Chita Works	Handa Community Industrial Festival	November 10	21,000



Keihin Community Festival

In addition, on-site recreational facilities are made available for community sports such as soccer, baseball, volleyball and basketball as well as other events sponsored by Group companies. Coaching sessions are offered by company baseball and track teams, which compete in Japan's top-level corporate leagues. Such activities promote sports and health as well as stronger relationships with host communities.

#### ● Tours of Steelworks

Every year, JFE Steel invites over 100,000 guests, mostly elementary and junior high school students from host communities, to tour steel production sites at each steelworks, in conjunction with festivals and other events.

#### ● Education at Elementary Schools

JFE Steel conducts plant tours for students at nearby elementary schools. In addition, company employees visit schools to give lectures on iron and steelmaking processes, the features of steelworks, environmental initiatives and other topics to deepen understanding of the steel industry. These lectures have been given to over 165 classes since its start in FY2012. In FY2017, the company conducted the first class at a school for hearing impaired children.



Visiting lecturer at Samugawa Elementary School in Chiba City

### Support for External Organizations

Contributing to the realization of a sustainable society is a key management concern for the JFE Group, which actively seeks to address issues in collaboration with external groups and NGOs in pursuing solutions for the 17 SDGs.

#### ● UN World Food Programme

The JFE Group seeks to resolve the global hunger issue by supporting the cause and activities of the Japan Association for the World Food Programme\*.

\*An NPO-accredited supporter of the UN World Food Programme (WFP), which works to eliminate hunger

#### ● Supporting Training for Foreign Medical Professionals

The JFE Group supports the Japanese Council for Medical Training, spearheaded by the Toranomon Hospital in Tokyo. The council offers a training program in which doctors from developing countries, primarily in Southeast Asia, are invited to study in Japan to foster stronger relationships between those nations and Japan. The program also contributes to enhancing the medical standards of those countries.

### ● Japanese Foundation for Cancer Research

Since its establishment in 1908, the Japanese Foundation for Cancer Research has upheld its basic philosophy of aiming to improve the well-being of people everywhere by achieving better cancer control. The JFE Group supports this foundation, which has played a leading role in research and treatment as well as human resource development in Japan.

### ● Fund to Support Children's Future

The JFE Group endorses the Japanese government's national campaign for creating a society in which every child can grow with dreams and hopes. The Group supports the Fund to Support Children's Future, which provides assistance to NPOs and other groups engaged in activities to eliminate poverty throughout Japan.

## Support for Youth Development

### ● Japanese Language Speech Contest

The JFE Group supports the All-China Japanese Speech Contest for university students in China as a way to promote stronger international exchange. The contest has been held since 2006 to further Japan-China relations through language and communication, and JFE has provided support from its launch. Through this activity, the JFE Group contributes to the development of Japanese language education in China and the promotion of friendly exchanges between the two countries.



Contest to help build the friendship between Japan and China

### ● High School Essay Contest

The Japan Science & Engineering Challenge is a national science-paper contest for high school and technical college students. Under the sponsorship of the Asahi Shimbun Company and TV Asahi Corporation, the contest has been supported by JFE Steel since 2006 to nurture future scientists and engineers.



(From left) 2018 JFE Steel Award recipients Yuta Koshobu, Ryotaro Ishiko, and Keita Watanabe of Hiroshima University Senior High School

### ● Career Education for Students

JFE Steel and JFE Engineering provide plant tours for female junior high school, high school and university students to encourage them to pursue careers in science and technology.

Since 2006, JFE Steel has participated in the Keizai Koho Center's "Business Training for Japanese School Teachers." Teachers from primary, junior high and high schools learn about business operations, human resource development, safety and environment-protection-related initiatives, among other topics, with the intention of sharing that knowledge with their students and leveraging it for better school management. In addition, some facilities invite local junior high students and host work-experience sessions.

As part of career education for high school and junior high school students, Kawasho Foods Corporation, a member of the JFE Shoji Trade group, cooperates with the School Support Center, a specified Nonprofit Corporation, to invite students for training. The participants learn how society is supported by specific kinds of work as well as the products and services related to such work.



Business training for schoolteachers

### ● FY2018 Internships

The JFE Group annually hosts many trainees and interns from overseas to help them gain practical experience at plants as well as design and construction sites. They also participate in group work.

Since FY2017, the JFE Shoji Trade Group has been providing opportunities for children with special needs to study outside the school. Students gain workplace

experiences such as serving coffee or cleaning offices while also learning about distribution by introducing and selling sweets and coffee shop goods that are produced at their school. The Group received 42 students in FY2018.

■ **Number of Interns Accepted by Each Operating Company (FY2018)**

JFE Steel	JFE Engineering	JFE Shoji Trade
Approx. 400	Approx. 370	Approx. 610

**Supporting Elementary Schools in Ghana and Nigeria**

Since 2011, the JFE Shoji Trade Group has continuously supported elementary schools in the West African countries of Ghana and Nigeria as part of its CSR activities. To address deficiencies in the local educational environment, it has also focused on donating goods related to education and food, which are essential for the sound development of children and greatly appreciated by the schools and governments in the countries. Donations in FY2018 included 700 sets of desks and chairs, 17,000 notebooks, and 12,500 cans of food. The ceremony was attended by many children and local educators.

The JFE Shoji Trade Group is committed to continuing this project into the future that symbolizes the Group's commitment.



Naosuke Oda, president of JFE Shoji Trade, with students at an elementary school in Ghana

**Supporting School Meals in Developing Countries**

JFE Shoji Trade participates in an activity led by TABLE FOR TWO International, a specified Nonprofit Corporation, in which a donation equivalent to one school meal for children in developing countries is made for every designated meal purchased by employees in the company's cafeteria.

**JFE 21st Century Foundation**

The JFE 21st Century Foundation was founded in 1990 through a donation from the JFE Group (the former Kawasaki Steel) to operate as a public-service corporation that contributes to society. It engages in various public services, such as supporting research at

universities and cultural development.

**Web** [JFE 21st Century Foundation → http://www.jfe-21st-cf.or.jp/eng/](http://www.jfe-21st-cf.or.jp/eng/)

**Support for Technology Research**

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

In FY2018, it fielded 194 grant requests and provided a total of 52 million yen in the form of grants valued at 2 million yen each for 13 projects involving iron and steel technologies and 13 projects related to environmental technologies, including those designed to prevent global warming.

**Support for Asian History Studies**

The foundation began awarding grants in support of Asian history studies at Japanese universities in FY2005. In FY2018, 70 applications were received and 11 grants worth 1.5 million yen each were awarded, bringing the total to 16.5 million yen.

■ **Grants: Cumulative Number of Projects and Value**

Field	Projects	Value
Technology Research	607	1,221.8 million yen
Asian History Studies	120	180 million yen

**Support Regional Activities**

The foundation financially sponsors community cultural activities including music, art, traditional events, community revitalization, community activities and the conservation of cultural property.

In FY2018, it sponsored events in cities across Japan and overseas, including Chiba, Kawasaki, Kurashiki and Fukuyama as well as Jiaying in Zhejiang Province, China.

**Supporting the Japan Overseas Educational Services Writing Contest and Anthology Donation**

The Japan Overseas Educational Services organizes contests in the areas of essays, poems, tanka and haiku for Japanese students attending elementary and middle schools overseas. The JFE Group has been cosponsoring the contest by offering JFE 21st Century Foundation prizes since FY1991. The foundation also donated 850 copies of "Chikyū ni Manabu" (Learn from the Earth), a collection of the winning entries again in FY2018, to 673 elementary and middle schools and 86 public libraries in the regions where the Group operates its steel business.

# Employees

## JFE Group's Basic Policy on Human Resource Management

- 1 Respect Human Rights and Facilitate Fair Management of Human Resources**  
 The Group manages human resources fairly by respecting the human rights of all employees and nurturing employees who embrace the Group's corporate values and standards of business conduct.
- 2 Foster a Corporate Culture that Nurtures People and Promotes Satisfying Workplaces**  
 The Group facilitates interactive communication among employees to cultivate a corporate culture that nurtures human resources and creates safe, attractive environments where everyone can enjoy working.
- 3 Diversify Human Resources**  
 The Group ensures that diverse all people, including women, non-Japanese, the elderly and the disabled, can demonstrate their full potential.
- 4 Recruit and Steadily Nurture Excellent Human Resources**  
 To survive in an increasingly complicated and diversified global environment, the Group steadily recruits diverse, high-quality skilled human resources, ensures that they receive the skills and knowledge necessary to continue strengthening the Group's technological capabilities, and nurtures their global capabilities.

## JFE Group Health Declaration

- 1** JFE, recognizing that safety and health are fundamental for fulfilling its mission, creates workplaces in which every employee can work with vigor.
- 2** JFE and its health insurance union work together to advance initiatives for maintaining and upgrading the physical and mental health of employees and their families.
- 3** JFE gives top priority to safety and health and to creating a health culture in which each employee takes personal responsibility.

## Workstyle Reform

Management of the JFE Group recognizes that creating workplaces to provide dignity and job satisfaction for all is essential for maximizing the potential of individuals. The JFE Group carefully recruits and nurtures human resources to support sustainable growth and is advancing reforms to realize more flexible workstyles for everyone.

**S** **Systems to Support Workstyle Reform**  
 JFE Steel is accelerating its efforts to enhance productivity and respond to more diverse needs of employees in their workstyles to help drive initiatives such as strengthening its manufacturing base and expanding overseas. Specific initiatives have been implemented to improve employee awareness and cultivate an organizational climate in which everyone can maximize their abilities. These include designating

days in which employees are encouraged to leave work on time, conducting programs in standardizing the number of hours between work shifts\* and work-at-home systems, and encouraging employees to take paid leave.

JFE Steel also has a work-life-balance vacation program to support employees in taking vacations for personal life events, self-enlightenment, or participation in volunteer activities.

\*A program to set a certain length of time between clocking out and clocking in on the next day to protect an employee's private life and sleeping hours.



Employees arrange their own schedules and choose the day when they will leave on time automatically.

### **E** Flexible Workstyle

JFE Engineering is striving to nurture a corporate culture of coming to work early and leaving early by designating 8:00 am to 4:45 pm as its standard working hours and in principle prohibiting work after 8 pm. Other initiatives include planning vacation schedules through discussions between employees and their supervisors and designating days when employees are encouraged to take paid leave or leave work on time. Telecommuting has been implemented to facilitate flexibility in workstyles. Now a working environment is in place in which employees can choose to work in one of the dozen shared offices around the country owned by a partner real-estate company.

JFE Engineering's next goals are to enhance workstyle reform by taking advantage of the findings from an employee satisfaction survey conducted in FY2018 and to realize a five-day workweek in its construction operations department in order to overcome the difficulty in taking days off, which has been a problem faced by the entire industry.

### **T** Initiatives to Support Various Workstyles to Realize a Work-life-balance

As a measure to realize a work-life-balance, initiatives

have been implemented to reduce work hours, such as designating Wednesdays as the day to encourage everyone to leave on time, prohibit all work after 10 pm, and also encourage taking paid leave.

To support more diverse workstyles, JFE Shoji Trade changed its flexible working hour program in April 2016 by setting the core worktime between 11 am to 2 pm, and by introducing work-at-home systems for employees pressed for time due to childrearing or nursing duties. The Company also implemented a program called Challenge Days, in which employees are given chances to experience various workstyles regardless of their time constraints.

## Operational Reforms

### Promoting Operational Reforms that Leverage the Newest ICT

To reduce employee time spent on simple for repetitive tasks and free up more time for creative work, JFE Steel implemented robotic process automation (RPA), a software to facilitate the automation of human work done on terminal devices. In FY2018, RPA was deployed in over 100 types of operation, releasing over 10 thousand hours to be spent on other productive work. The company will also continue to expand RPA in FY2019.


JFE Steel is pushing ahead with a company-wide project launched in FY2016 to upgrade mission-critical systems at each steelworks toward promoting operational reform as well.

The company will actively engage in operational reform by leveraging the newest ICT and use the time generated by the operational reform to improve customer service.

### Smart-Work Project


JFE Engineering has been actively working on operational reforms since August 2014 and set up "Office of Smart-Work Promotion" in April 2018 to further expand this effort.

By leveraging various IT tools and systems, and creating an unconventional working style in terms of time, location and method, the company aims to achieve both work-life-balance and improved productivity while maximizing overall output.


 JFE Shoji Trade will continue to drive its J-SLIM program, which is an operational reform aimed at increasing work efficiency and performance in four

focus areas: systems, company-wide management, working environments and line work. The number of organizations using RPA has been rising since FY2018, when the implementation project took off. It has provided numerous advantages such as significantly reducing time spent on certain jobs through automation as well as expediting the provision of services. Also, JFE Shoji Trade is seriously considering implementing the newest IT tools to further increase productivity. JFE Shoji Trade will continue with its effort to think outside of the box and flexibly address change to create a corporate culture that encourages continuous innovation.

### Invigorating Workplaces through Small Group Activities

 JFE Steel has approximately 1,500 small groups that carry out J1 Activities\* for quality and work improvement. In addition, the JFE Family Result Reporting Conference, which includes participation from domestic and overseas Group companies, is held twice a year. Also, groups selected through competition are given opportunities to go overseas as incentives.

\*Designed to turn JFE into an excellent company and propel it to the number one position in its industry (called JE1 Activities at JFE Engineering).

 JFE Engineering has about 200 teams and 2,100 employees, including those of group companies worldwide, involved in JE1 Activities. The results of these activities are showcased at a company-wide competition held at the end of the fiscal year. Activities focused on topics such as quality, efficiency, safety or costs contribute significantly to workplace vitality and corporate performance.

 Since 2012, JFE Shoji Trade has been conducting J1 Activities in production divisions of its group companies in Japan as a means of improving their problem-solving skills in areas such as safety, quality, cost, operations and delivery target. The company holds annual competitions in which about 20 teams from the east and west districts report their activity results and compete against each other. Awards are given to the highest achieving teams. The company will continue to promote J1 Activities to improve workplace vitality and performance.

## Workforce Diversity

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

Moreover, in the face of the recent trends of a declining birthrate and aging population as well as a decreasing labor force, diversity has become increasingly important for reliably securing excellent human resources.

### ● Company Policy Explained by the President

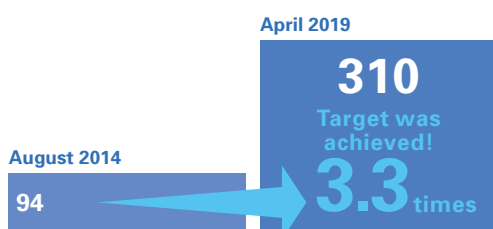
The president of JFE Holdings has endorsed the Declaration on Action that was introduced by a group of male leaders in Japan who intend to create “A Society in which Women Shine” with the support of the government’s Gender Equality Bureau Cabinet Office. He also announced additional measures to support the professional development of female personnel, thereby communicating both inside and outside the company that women can play active roles at JFE.

### ● Supporting Women in Professional Development

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

The Group has set a target to triple its number of women in managerial positions by 2020. As of the end of August 2014, there were 94 female managers, or 1.8% of all managerial positions, at JFE Holdings and its three operating companies. By April 2019, the figure increased to 310, or 5.4%, owing to initiatives to increase earlier promotion.

#### ■ Female Managers in the JFE Group: Actual and Target



The JFE Group formulated an action plan to support women in their professional development in compliance with the Act on Promotion of Women’s

Participation and Advancement in the Workplace (enforced in April 2016), based on which the company discloses relevant information. In recognition of its efforts to encourage the empowerment of women, JFE Holdings was selected three times as a “Nadeshiko Brand\*” during FY2013–FY2016.


\*The Nadeshiko Brand represents a joint initiative by the Ministry of Economy, Trade and Industry and the Tokyo Stock Exchange. It recognizes exemplary efforts by companies to encourage women to play active roles and continue working long-term. The targets are representative companies from business sectors listed on the TSE first section.


### ● Activities by Diversity Promotion Sections

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

### ● Key Initiatives

 JFE Steel provides career support and management training for managers and other employees to cultivate a culture in which diverse human resources can demonstrate their full potential. Its steelworks employ more than 350 females who are currently working on-site. The company has recently been actively hiring foreign nationals to secure human resources to meet the company’s globalization strategy. Various measures have been implemented to support comfortable work environments for non-Japanese employees such as a training program for supervisors who will be working with them. The company also supports employees who are using childcare and nursing care by providing workplace nurseries and holding nursing care seminars. In April 2019, workplace nurseries opened in all districts of our east and west steelworks.

 JFE Engineering actively hires personnel with diverse characteristics and values, as well as people from other business sectors. Around 80 people are hired each year as mid-career placements. The head office regularly provides training to about 80 regional employees of overseas group companies to cultivate mutual understanding and transcend differences in culture and customs. In addition, the company is striving to provide opportunities for management to improve awareness of diversity as well as providing leadership training and seminars for female employees.

 JFE Shoji Trade is expanding opportunities for female employees by promoting them to

managerial positions, expanding clerical categories and revising duties. It is also supporting career development through enhanced training programs.

Management training in Japan is provided for employees hired overseas to promote global personnel development and increased interaction.

The company is creating increasingly sound and flexible working environments by introducing a work-at-home systems, rehiring former employees, expanding nursing care support, encouraging employees to take paid leaves, and other efforts.

### ● Employment of People with Disabilities

The JFE Group has three special subsidiaries, JFE Apple East Corporation, JFE Apple West Corporation and Mie Data Craft Co., Ltd., to employ people with disabilities and create enjoyable workplace environments for them.

#### ■ Employment of People with Disabilities (as of June 1 of Each Year)


	2015	2016	2017	2018	2019
JFE Steel	2.25	2.24	2.34	2.33	2.41
JFE Engineering	2.01	1.59	2.01	2.14	2.39
JFE Shoji Trade	2.25	2.11	1.86	2.20	2.62


### ● Reemploying Retirees


The JFE Group reemploys people after mandatory retirement at age 60, largely to ensure that the skills and experience of veteran employees are handed down.

In the spirit of Japan's Act on Stabilization of Employment of Elderly Persons, the Group has created a system for all employees to work until the age of 65.

As of April 2019, 1,352 elderly employees, about 7% of the total, are working at JFE Steel, JFE Engineering, and JFE Shoji Trade.

 For an enhanced work-life-balance, JFE Steel employees can choose full-time employment or shorter workweeks after reaching their retirement age.

 JFE Engineering created the Skilled Partner Program to rehire employees who want to continue working after mandatory retirement at age 60.

 For an enhanced work-life-balance, JFE Shoji Trade employees who reach retirement age may choose from a variety of working arrangements, including full-time employment, shortened workweeks, and shortened daily work hours.

### ● Respect for Sexual Minorities (LGBT)

In order to promote diversity in the workplace, the JFE Group is cultivating a corporate culture that accepts diversity, including sexual minorities, through training to deepen awareness of human rights as well as position-specific curriculums. In FY2018, an LGBT study group was convened for human resources representatives in each district of JFE Steel's business locations.

In addition, the Group recently included sexual minorities in the compliance guidebook it distributes to all employees as a means of promoting common understanding.

## Securing Diverse Human Resources

### Sixth Medium-term Business Plan (FY2018–FY2020):

Around **1,040** people

### FY2019 Results:

**1,171** people

- Women in positions with prospects for promotion: 14% (62 out of 442)  
Of the above, those in white-collar positions: 26% (37 out of 140)
- Mid-career and year-round recruits: 21% (241 out of 1,171)  
Of the above, recruits in positions with prospects for promotion: 26% (116 out of 442)  
Of the above, recruits in on-site positions at steelworks: 17% (124 out of 713)  
(three operating companies, excluding their subsidiaries)

To ensure sustainable growth, the JFE Group steadfastly recruits from a diverse pool of applicants and actively hires women, foreign nationals and midcareer personnel, and recruits year-round.

#### ■ Recruitment Results (Three Operating Companies, Excluding their Subsidiaries) in FY2019

	Career-track Positions			On-site and Clerical Positions	Total
	White-collar	Technical	Total		
Male	103	277	380	640	1,020
Female	37	25	62	89	151
Total	140	302	442	729	1,171
Ratio of women (%)	26.4	8.3	14.0	12.2	12.9

#### ■ Target Ratios for Female Recruits

	Position	Target
JFE Steel	Career-track white-collar positions	At least 35%
	Career-track technical positions	At least 10%
	On-site positions for regular recruitment	At least 10%
JFE Engineering	Career-track position	At least 20%
	Production/construction positions (technical)	At least 5%
JFE Shoji Trade	Career-track position	At least 25%

## Employee Data (Consolidated)

As of March 31, 2019

Category	JFE Steel	JFE Engineering	JFE Shoji Trade
Employees	44,975	9,569	7,498
Male	39,460	8,280	5,430
Female	5,515	1,289	2,068
Management positions	11,582	3,170	1,620
Male	10,916	3,020	1,390
Female	666	150	230
Ratio of women in management positions (%)	5.8	4.7	14.2

• Consolidated subsidiaries (JFE Steel: 156, JFE Engineering: 56, JFE Shoji Trade: 101)

## Employee Data (Non-consolidated)

Category	JFE Steel	JFE Engineering	JFE Shoji Trade
Employees	15,677	3,847	974
Male	14,373	3,340	607
Female	1,304	507	367
Management positions	2,766	2,284	626
Male	2,629	2,160	585
Female	137	124	41
Women in management positions (%)	5.0	5.4	6.5
Recruits	937	165	69
Male	838	142	40
Female	99	23	29
New graduates	783	86	61
Mid-career	154	79	8
Average years employed	16.3	13.6	12.1
Male	16.1	13.6	12.3
Female	18.2	13.6	11.8
Job turnover rate (%)	2.4	1.2	3.9
Rehired employees	1,004	321	27
Average annual leave taken (days per year)	16.1	17.6	12.9
Average overtime (hours per month)	28.1	28.1	26.1
Employees working shorter hours for childcare (aggregated)	148	59	15
Temporary staffs	203	758	12

• As of April 1, 2019. Other figures are as of FY2018.  
 • Management positions at JFE Engineering and JFE Shoji Trade include employees on loan.  
 • Job turnover rate: percentage of employees who voluntarily choose to resign from the organization.

## Human Resource Development

The JFE Group collectively carries out human resource development with an emphasis on nurturing the capacities of each employee and cultivating global human resources to support the expansion of our overseas business.

### Utilizing Skill Data for Training Programs

The company utilizes an evaluation system at manufacturing sites to quantitatively analyze the skill level of each employee. By focusing on infrequent or irregular tasks involving relatively high skill levels, the training program is linked organically to accumulated skill data,

backed by practical guidance from full-time instructors (technical experts) who possess advanced skills.

### Training Programs to Support Independent Learning

To enhance the knowledge of underlying technologies that represent a technological foundation for an engineering enterprise, the Company's leading expert lectures over 30 different courses on basic technology for younger employees and mid-career hires.

A new web-based learning curriculum was launched in FY2018 to offer employees opportunities to acquire business skills that cater to each job responsibility, including accounting and marketing.

### Training and Measures to Maximize Employee Potential

In order to unlock the potential of employees with diverse backgrounds and exploit their maximum abilities, JFE Shoji Trade offers female employees a variety of training opportunities, including next-generation female leader training for increasing their active participation in business. JFE Shoji Trade also invites regional employees hired at overseas offices that require a high level of competency to Japan for training in order to increase their skills and motivation, and the company offers training for newly hired mid-career employees as well. In addition, a corporate recognition system has been established to boost employee motivation. JFE Shoji Trade annually presents achievement awards to employees and awards for performance, achievement, and safety to its group companies.

### Developing Global Personnel

In addition to hiring and developing non-Japanese for career-track positions in Japan and hiring more local personnel overseas, the JFE Group is enhancing programs for Japanese employees to gain overseas study and training. The company is also developing younger employees through practical experience by dispatching them on overseas assignments.

#### Global Personnel Development Programs

Company	Program
S E T	Study abroad
S T	Short-term overseas language training
S E T	Overseas assignments for younger employees
S	Dispatching engineers to international conferences
S E T	Training for regional employees of overseas offices
E	On-the-job training in Japan for regional employees of overseas offices
S E	Internship for international students



## Employee Health and Safety

Providing for the health and safety of employees is a basic requirement of companies, particularly manufacturers, and is fundamental to the continued existence of any company. The JFE Group adheres to the philosophy of safety first, and, together with its group companies and business associates, works to consistently maintain safe working environments and secure workplaces for all employees. Top managers from each Group company conduct safety patrols and inspections to enhance occupational safety.

In addition, the Group exchanges ideas on safety and health with the labor union through its Occupational Safety and Health Committee.

### Lost-work Injuries and Severity (Rates)

		2014	2015	2016	2017	2018
JFE Steel	Lost-work injuries	0.15	0.15	0.21	0.17	0.17
	Severity	0.09	0.16	0.15	0.15	0.15
JFE Engineering	Lost-work injuries	0.42	0.28	0.19	0.71	0.82
	Severity	0.40	0.01	0.3	0.02	0.02
JFE Shoji Trade Group	Lost-work injuries	0.65	0.67	1.16	1.22	0.60
	Severity	0.07	1.02	0.41	0.97	0.04
Manufacturing industry average	Lost-work injuries	1.06	1.06	1.15	1.02	1.20
	Severity	0.09	0.06	0.07	0.08	0.10

- JFE Steel and JFE Engineering: parent company, business associates and contractors in Japan; JFE Shoji Trade: parent and consolidated subsidiaries, business associates and contractors in Japan
- Lost-work injuries (rate) = number of employees with lost-work injuries/total working hours × 1,000,000
- Severity = number of lost working days/total working hours × 1,000

### Lost-work Injuries Involving Employees (Number of Fatal Injuries Shown in Parentheses)

	2016	2017	2018
JFE Steel	6 (1)	4 (1)	7 (1)
JFE Engineering	0 (0)	0 (0)	1 (0)
JFE Shoji Trade Group	8 (0)	9 (1)	5 (0)

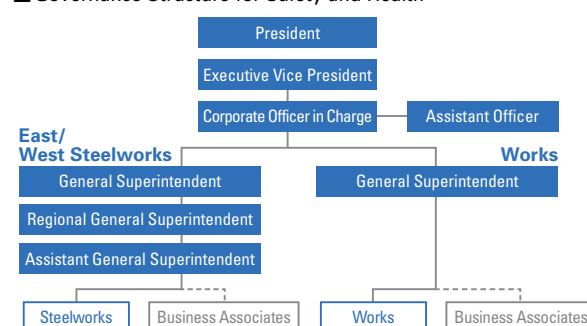
### Lost-work Injuries Involving Business Associate Employees (Number of Fatal Injuries Shown in Parentheses)

	2016	2017	2018
JFE Steel	16 (1)	14 (1)	11 (1)
JFE Engineering	4 (1)	14 (0)	17 (0)
JFE Shoji Trade Group	1 (0)	1 (0)	0 (0)

**S** In FY2019, JFE Steel is following three basic strategies: promote the autonomous resolution of issues, strengthen health and safety at business associates and Group companies and develop activities in line with the Group's Health Declaration. For example, JFE Steel's safety level was inspected by an external organization, Du Pont, and the company received feedback on its auditing methods. With this feedback, an

internal audit system was implemented and applied to all parts of the company. In addition, the company plans to obtain ISO (JIS) 45001 certification, an international standard for occupational health and safety management systems established in 2018. Iterating through the PDCA cycles of these safety and health initiatives, the company is working to establish a corporate culture of safety that is voluntary and independent.

### Governance Structure for Safety and Health



**E** JFE Engineering strives to eliminate accidents at its construction and operating sites and manufacturing plants. By establishing “priority items to be shared across the company” to which all employees and all members of associated companies adhere and promoting “identification of sources of danger and safety measures based on risk assessments” in accordance with each operation, the company is committed to disaster elimination. Additionally, driving efforts such as “physical and mental health promotion” and “creation of comfortable working environments” help to ensure the health of employees and raise the level of occupational health. In 2016, the company obtained OHSAS 18001 certification, an international standard for occupational health and safety management systems, for its construction activities in Japan and overseas as well as its manufacturing operations at the Tsurumi and Tsu Works. The company plans to upgrade certification to ISO 45001 in 2019.

**I** JFE Shoji Trade is actively working on eliminating unsafe operations that could lead to severe accidents and targeting zero severe accidents at its processing sites such as coil centers.

For each of its group companies, JFE Shoji Trade assigns a safety manager, who is responsible for improving safety at each company. Every safety manager is also responsible for activities such as (1) strengthening on-site patrols, (2) establishing safety monitors, (3) enforcing risk assessment and hazard

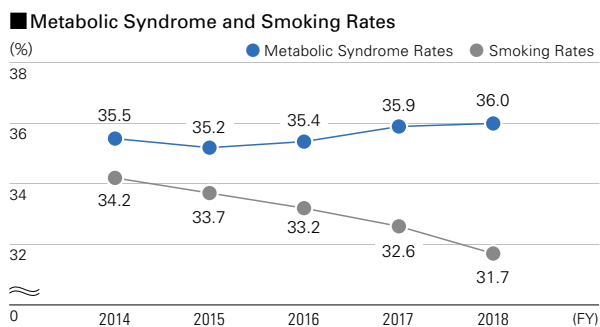
prediction, and (4) identifying unsafe operations. Safety managers meet every other month to share information. All workplace accidents that result in employees being absent from work must be reported to the top management from the president of each Group company as part of the JFE Shoji Trade Group's group-wide effort to address safety management. Annual safety awards are also presented. Through these initiatives, the company will raise the level of safety management within the whole group and continue to maintain safe working environments.

## Employee Health

The JFE Group has made the JFE Group Health Declaration (page 67) and collaborate with its health insurance union and industrial health staff to strengthen employee health so that everyone can work with vigor.

### Physical Health Initiatives

- Ensure the implementation of regular physical examinations and strengthen cancer screenings.
- Prevent aggravation of lifestyle diseases by conducting metabolic syndrome checkups and offering health guidance.
- Encourage participation in sports by supporting club activities and using the Powering Up Health Care program of the health insurance union.
- Promote non-smoking areas and maintain separate areas for smokers and non-smokers in buildings. Provide guidance to help employees quit smoking through industrial physicians and public health nurses.



Data on those aged 40 or older and insured by the JFE Group's health insurance union

### Maintaining and Promoting the Health of Employees' Families

The JFE Group strengthens the health of employees and their families by, for example, encouraging

spouses to undergo health examinations. The rate of health examinations for dependents (age 40 or older) has been steadily increasing over four years, to 48.2% in FY2018, up 10.6 points from 37.6% in FY2014.

### Mental Healthcare

The JFE Group conducts four basic initiatives to maintain the mental health of employees: "self-care" for workers who strive to remain aware of stress and take preventive measures; "care by management supervisors" who provide advice to subordinates; "care by industrial health staff" who support employees, managers and supervisors; and "care by human resources outside workplaces," including specialist clinics and individuals.

JFE's health insurance union also provides mental health counseling, including a 24-hour hotline for employees and their families (spouse and dependents).

### Active Exercise

JFE Steel business sites offer the Active Exercise program, which the West Japan Works designed to help people increase their physical strength and prevent injuries due to falling. The program's effectiveness in preventing occupational accidents and improving health has even attracted attention outside the company, so it is being shared as a contribution to society.

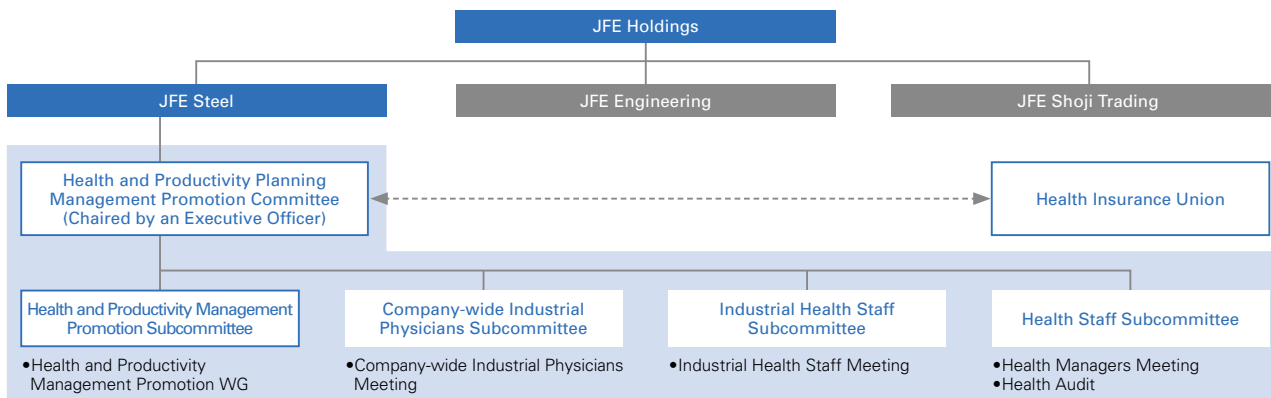
### Company-wide Goals and Follow-ups

To drive initiatives regarding maintaining and improving the health of employees and their families, JFE Steel has established and is monitoring the achievement of medium- to long-term goals applicable to all affiliate companies.

#### Company-wide Targets for 2020

	Targets	2018 Results (est.)
Thorough implementation of physical examinations	Rate of complete exams: 100%	82.2%
	Rate of complete exams for dependents: 60%	52.3%
Preventive health measures	Rate of providing specific health guidance: at least 35%	48.9%
	Rate of obesity (BMI: 25% or higher) 25% or less	29.2%
Maintaining and improving health	Participation in the Powering Up Health Care program: at least 50%	44.8%
Promotion of non-smoking	Smoking rates: 25% or less	34.8%

■ Health and Productivity Planning Management Promotion System



Health and Productivity Management Promotion WG

Members	<ul style="list-style-type: none"> <li>■ Each region, works, main office</li> <li>■ Health Insurance Union</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial physicians and public health nurses</li> <li>• Manager of Labor Management Office, Labor Management HR Department, Organizational HR Department</li> <li>• Office of Safety and Health (health staff), Safety and Health Department</li> <li>• Directing Manager, Manager of Health Development Office</li> </ul>
Discussion Topics	<ul style="list-style-type: none"> <li>■ Evaluation of Health and Productivity Management (physical, mental and work environment) (evaluation of indices and activities)</li> <li>■ Company-wide activities</li> <li>■ Reporting to the management team</li> </ul>	
Frequency	<ul style="list-style-type: none"> <li>■ February, May, August, November (once a quarter)</li> </ul>	

## Developing Dynamic Working Environments

**S** Recognizing that labor-management cooperation is essential for the company to fully tackle its business challenges, JFE Steel has established a strong relationship with its labor union based on understanding and trust. The company convenes its Labor-Management Business Discussion Committee four times a year to bring the president and other executives together with labor representatives for the purpose of exchanging ideas on business challenges. The two sides also share views on working conditions and workplaces and hold joint consultations whenever the labor system is revised. In 2018, an employee satisfaction survey was conducted as a step toward creating a workplace in which every employee can experience pride and a sense of fulfillment. Looking ahead, the company will incorporate our findings into management and other areas.

**E** JFE Engineering strives to ensure sound labor-management relations. In addition to Central Labor-management Committees, which are regularly

convened for the company's president and other executives to share views with representatives of its labor union, a labor-management committee on work-life-balance helps to maintain friendly working environments.

**I** JFE Shoji Trade management and labor regularly exchange opinions and share information. The company president and other executives exchange views with representatives of its labor union during semiannual Management Committee meetings.

### ● Promoting Satisfying Work Environments

In addition to meeting legal requirements for the minimum wage, upper limits for overtime, and other mandates, the JFE Group establishes challenging and satisfying work environments by providing our employees with one of the top levels of employment conditions in the industry as well as performance-based bonuses linked to company profits.

Furthermore, the Group offers generous welfare benefits, including dormitories and company housing in order to provide a stable environment for our employees and encourage them to remain with the company for many years.

## Stakeholder Engagement

The JFE Group strives to maintain agreeable and favorable relationships with all stakeholders, including

shareholders, customers, clients, employees and local communities, for the sustainable growth and medium- to long-term increase of corporate value.

### JFE Group's Major Stakeholders

Stakeholder	Approach	Major communication methods, etc.	Others	
			Frequency (per year)	Scale, etc.
Shareholders/ Investors	We work to disclose information accurately, fairly and in a timely and appropriate manner as well as strive for active communication. We established the Investor Relations and Corporate Communications Department as an organization responsible for communication with domestic and international shareholders and investors, and promote constructive dialogue as well as provide management with the information acquired, with the aim of maintaining and improving the relationship of trust.	Ordinary general meeting of shareholders (convocation notices, notices of resolutions, etc.)	1	Approx. 150,000 (unit shareholders)
		Investors meeting (financial results, medium-term business plan, etc.)	4	Approx. 500 persons in total
		Individual meeting (financial results, medium-term business plan, etc.)	As needed	Approx. 400 persons in total
		Briefings (at the branch offices of securities firms, etc.)	10	Approx. 1,000 persons
		Plant tours for shareholders (steel, engineering, shipbuilding bases, etc.)	25	Approx. 2,100 persons
		Publishing shareholder newsletters (JFE Dayori)	2 (mid-year and annual)	Approx. 220,000 copies/issue
		Various reports, including integrated reports and CSR reports	1	Approx. 40,000 copies
		Information via websites (for shareholders and investors), etc.	As needed	
Customers	The Group believes that the stable supply of products and services and reliable quality assurance, along with advancing research and development, are necessary to meet customer needs. We will work to establish win-win relationships by continuously meeting customer needs and the trust they place in us.	Communication through sales activities and support for quality assurance	As needed	Conducted at each operating company
		Interviews and questionnaires, such as that on customer satisfaction	As needed	Conducted at each operating company
		Information via websites (product information), etc.	As needed	
Clients	CSR initiatives are being actively pursued together with our clients, who are important business partners. We have established Purchasing and Procurement Policies to promote fair and sincere procurement activities and to construct healthy relationships with clients.	Communications through purchasing activities	As needed	Conducted at each operating company
		Briefing and discussions	As needed	Conducted at each office
		Information via website, etc.	As needed	
Employees	With the recognition of top management that creating workplaces to provide dignity and job satisfaction for all is essential for maximizing the potential of individuals, we have formulated the Basic Policy on Human Resource Management and Health Declaration and are conducting various activities toward attaining the goals.	Communications through daily operations and in the workplace	As needed	
		Internal newsletters and intranet	As needed	
		Various labor-management committees	2 to 4	Management and labor unions at each operating company
		Corporate Ethics Hotline	As needed	80 calls in FY2018
		Various training sessions	As needed	Position-specific, compliance, human rights, etc.
		Family days (visits by employee families, lunch at employees' cafeterias, etc.)	As needed	Conducted at each operating company
Local communities	To ensure business continuity at manufacturing bases where steelworks are located and elsewhere, constructing a relationship of trust with citizens in local communities and realizing coexistence and prosperity are crucial. We will pursue various activities with the aim of realizing sustainable growth and regional development, including continued initiatives toward ensuring safety and reducing our environmental impact.	Communication through local residents' associations, events, etc.	As needed	
		Events at manufacturing bases (festivals, etc.)	Approx. once in each region	Approx. 280,000 persons a year
		Plant tours	As needed	100,000 or more persons a year
		Clean-up activities (vicinity of manufacturing bases, regional cleaning, etc.)	As needed	
		Sports promotion (baseball or jogging workshops, various sports competitions, etc.)	As needed	
		Others (education at elementary schools, craft workshops, workplace experience events, etc.)	As needed	
		Information via websites (environmental info, etc.)	As needed	
		Social contribution through JFE 21st Century Foundation (various research support, regional activity support, etc.)	As needed	

 [JFE 21st Century Foundation →  
https://www.jfe-21st-cf.or.jp/eng](https://www.jfe-21st-cf.or.jp/eng)

# External Awards

## MSCI ESG Leaders Indexes and MSCI Japan Empowering Women Index (WIN)

JFE Holdings has been included in the MSCI ESG Leaders Indexes and MSCI Japan Empowering Women Index operated by U.S.-based MSCI. Both indexes select companies that have been recognized for their outstanding ESG activities. To be included in the MSCI Japan Empowering Women Index (WIN), a company must be selected for the MSCI Japan IMI Top 500 brands and then ranked in the top half of its industry based on a multilateral gender diversity score. The Government Pension Investment Fund (GPIF) for Japan, one of the world's largest pension funds, has selected this index as a benchmark for its ESG investment strategy.



THE INCLUSION OF JFE HOLDINGS IN ANY MSCI INDEX, AND THE USE OF MSCI LOGOS, TRADEMARKS, SERVICE MARKS OR INDEX NAMES HEREIN, DO NOT CONSTITUTE A SPONSORSHIP, ENDORSEMENT OR PROMOTION OF JFE HOLDINGS BY MSCI OR ANY OF ITS AFFILIATES. THE MSCI INDEXES ARE THE EXCLUSIVE PROPERTY OF MSCI. MSCI AND THE MSCI INDEX NAMES AND LOGOS ARE TRADEMARKS OR SERVICE MARKS OF MSCI OR ITS AFFILIATES.

## SNAM Sustainability Index

JFE Holdings has been chosen for eight consecutive years as a constituent of the SNAM Sustainability Index, which was launched by Sompo Japan Nipponkoa Asset Management (SNAM) in August 2012. The index, which encompasses companies with highly evaluated ESG ratings, contributes to investor asset formation by evaluating corporate value from a long-term perspective.



## DBJ Environmentally Rated Loan Program

The Development Bank of Japan (DBJ) Environmentally Rated Loan Program utilizes a screening (rating) system developed by DBJ to evaluate environmental management and then assign a corresponding interest rate from three levels. This was the world's first loan program to incorporate environmental ratings in its financing menus. In March 2016, JFE Holdings was rated as a top-ranking company that pursues excellent and advanced environmental initiatives resulting in outstanding environmental-management performance, based on which the company secured a loan under the program.



JFE was rated by DBJ as a company pursuing excellent and advanced environmental initiatives in March 2016

## DBJ Employees' Health Management Rated Loan Program

The DBJ Employees' Health Management Rated Loan Program is the world's first financing menu that bases loan conditions on DBJ's proprietary system for rating health management for the purpose of selecting and evaluating companies based on their performance in this area.

JFE Holdings' efforts in pursuing employee health management has been highly regarded, and it is rated as a top-ranking company under the program.



## Caterpillar Quality Assurance Certification

In 2019, JFE Steel West Japan Work (Kurashiki District) and JFE Shoji Trade were named for three consecutive years as Gold Level SQEP suppliers for the Supplier Quality Excellence Process, a quality certification of the U.S.-based construction equipment manufacturer Caterpillar Inc. The program ranks suppliers for compliance with ISO 9001 standards and Caterpillar's own specifications and certifies the top firms as Platinum, Gold, Silver or Bronze. Only a few companies in Japan have received Gold Level certification, and JFE Steel is the world's first blast furnace company to be certified.



Receiving the Gold certification plaque

## Competitive IT Strategy Company for Five Consecutive Years

JFE Holdings was selected for inclusion in the Competitive IT Strategy Company Stock Selection for five consecutive years by the Ministry of Economy, Trade and Industry and the Tokyo Stock Exchange. The program, which recognizes companies that actively implement competitive IT, deepens investor understanding of the strategic utilization of IT to boost medium- to long-term corporate value and competitiveness.



### Awards for Technologies and Product Development, etc. (FY2018)

	Prize/Award	Distinction	Sponsor
JFE Steel	The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology (Prizes for Science and Technology, Development Category)	Development of Super-SINTER™, which reduces CO <sub>2</sub> emissions in the process of producing raw materials for ironmaking	Ministry of Education, Culture, Sports, Science and Technology
	Invention Prize (National Commendation for Invention)	Invention of shipbuilding plates with excellent brittle crack propagation resistance	Japan Institute of Invention and Innovation
	Information Technology Award (IT Special Award (System Integration Award))	JFE Group's accounting system overhaul project	Japan Institute of Information Technology
	The Energy-Efficient Machinery Award (The Japan Machinery Federation President's Award)	Air leak visualization device to detect leak amount and direction (MK-750)	The Japan Machinery Federation
	Japan Society for the Promotion of Machine Industry President's Award (Machine Promotion Award)	Magnetic leakage flux tester for minute unevenness of steel sheets surface	Japan Society for the Promotion of Machine Industry
JFE Engineering	Okochi Memorial Technology Prize	Development of SP3, high wear resistant heat treatment rail for heavy haul railways with extreme fine pearlite structure	Okochi Memorial Foundation
	The Minister of Environment's Commendation for Global Warming Prevention Activity	BOG Re-liquefaction facility "MiReLiS™"	Ministry of the Environment
	JSME Medal for New Technology	A city gas calorific value adjustment system "Atoms™" with novel atomization technology	The Japan Society of Mechanical Engineers
	Engineering Commendation Award of ENAA (Environmental Contribution)	New BOG Re-liquefaction booster facility project Team	Engineering Advancement Association of Japan
	Engineering Commendation Award of ENAA (Engineering Promotion)	Toyohashi biomass project team	Engineering Advancement Association of Japan



Japan Society for the Promotion of Machine Industry President's Award of the Machine Promotion Award



Okochi Memorial Technology Prize



The Minister of Environment's Commendation for Global Warming Prevention Activity



JSME Medal for New Technology

# Independent Assurance Statement



## Independent Assurance Statement

September 25, 2019

Mr. Koji Kakigi  
Representative Director, President and CEO of JFE Holdings, Inc.

### 1. Purpose

We, Sustainability Accounting Co., Ltd., have been engaged by JFE Holdings, Inc., ("the Company") to provide limited assurance on the Company's environmental performance indicators during the fiscal year 2018 reported in JFE Group CSR REPORT 2019, which indicate 52.1 million tons of CO<sub>2</sub> for Scope1, 7.5 million tons of CO<sub>2</sub> for Scope2 and 16.7 million tons of CO<sub>2</sub> for Scope3, and 240 million tons of industrial water accepted by the Company (collectively, "the environmental performance indicators"). The purpose of this process is to express our conclusion on whether the environmental performance indicators were calculated in accordance with the Company's standards. The Company's management is responsible for calculating the environmental performance indicators. Our responsibility is to independently carry out a limited assurance engagement and to express our assurance conclusion.

### 2. Procedures Performed

We conducted our assurance engagement in accordance with International Standard on Assurance Engagement 3000 (ISAE 3000) and International Standard on Assurance Engagement 3410 (ISAE 3410). The key procedures we carried out included:

- Interviewing the Company's responsible personnel to understand the Company's standards and reviewing the Company's standards
- Visiting to one of the Company's sites
- Performing cross-checks on a sample basis and performing a recalculation to determine whether the environmental performance indicators were calculated in accordance with the Company's standards

### 3. Conclusion

Based on the procedures performed, nothing has come to our attention that causes us to believe that the environmental performance indicators have not been calculated in all material respects in accordance with the Company's standards.

We have no conflict of interest relationships with the Company.

A handwritten signature in black ink, appearing to read "Takashi Fukushima", is written over a vertical line.

Takashi Fukushima  
Representative Director  
Sustainability Accounting Co., Ltd.

# Third-party Comments



**Yoshinao Kozuma**

Emeritus Professor  
Sophia University

## 1. Proper Management of Information Disclosed in Various Reports

The JFE Group's Sixth Medium-term Business Plan places high priority on "Ongoing ESG Initiatives," and the progress of these initiatives is disclosed through various mediums, including the CSR Report, the Integrated Report, and even the Annual Securities Report. When disclosing information through different mediums, it is essential to carefully select the information that is necessary and sufficient for each and to ensure consistency so that all of the corporate reports are reliable overall. The Group significantly improved the quality of ESG-related information disclosed in the section for challenges to be addressed in your Annual Securities Report. In general, few companies try to link ESG-related information in their Annual Securities Report as well as through other mediums, but your reports demonstrate that the Group is managing the information disclosed in each of them properly.

## 2. Advanced Scenario Analysis

Since its issuance in June 2017, TCFD recommendations are increasingly attracting the interest of industries in Japan. The JFE Group announced its endorsement of the report in May 2019 and began disclosing information consistent with its recommendations. The scenario analysis disclosed in this year's CSR Report is indeed its best part, with six pages of detailed analysis on business strategy based on the Long-term Vision for Climate Change Mitigation established by the Japan Iron and Steel Federation, in which JFE Steel participates as a core member. The analysis was conducted on a set of different scenarios considered highly probable. By including resilience among the factors under review, the Group's scenario analysis is now one of the most advanced in Japan. Your proactive disclosure of excellent quality information, describing a long-term vision of climate change actions, is to be highly commended.

## 3. System for CSR Procurement

ESG initiatives should be undertaken throughout the value chain, and establishing a supply chain that is closely aligned with a sustainable society is at the core of every initiative. JFE Steel established its Raw Materials Purchasing Policy in February 2019 and began conducting procurement in accordance with the principles of respect for human rights, legal compliance, and environmental protection. I hope this will propel a Group-wide move to implement a CSR procurement system.

## 4. Future Challenges

Disclosing data on lost-work injuries for employees of the Group and those of business associates marks a major improvement in this year's report. However, we must seriously address the fact that fatal injuries did occur. Considering the nature of the business, I believe that the necessary actions were in fact implemented; however, you must once again review your employee health and safety measures. Another key challenge to face going forward is the creation of more objective KPIs with quantitative goals so as to enhance transparency and strengthen the persuasiveness of the assessed results.



## Third-party Comments



**Mariko Kawaguchi**

Senior Principal,  
Research Division, CMA  
Daiwa Institute of Research Ltd.

This is my third opportunity to offer comments on the JFE Group's report. I felt that this year's report reflects a high level of enthusiasm. In addition to the detailed TCFD scenario analysis, introduced for the first time this year, the report shows progress from the previous year in terms of the organization and presentation of information in a visual, reader-friendly fashion. The explanations for the Group's value chain and climate change initiatives clearly identified the stages of activities and impact on risks and opportunities.

Meanwhile, the increasing severity of the global environmental crisis was evident through multiple catastrophic events, including the European heatwave, wildfires in the Arctic in June, fires that ravaged the Amazon rainforest into August, and a major hurricane that hit North America in September. In addition, news about massive volumes of plastic waste threatening the sustainability of the ocean ecosystem is being broadcasted almost daily. Japan also suffered severe flood damage from torrential rainfalls that hit Kyushu and western Japan this summer with unprecedented impact, forcing railways to suspend service during the busiest holiday.

Under these circumstances, companies involved in the steel business, which is associated with high carbon emissions, are vulnerable to critical public judgement. Therefore, the key to future growth, in my opinion, is to formulate bold management strategies toward decarbonization that take into account the social value of steel as well as its social cost based on the acknowledgement that the steel industry is in fact a high carbon-emitting enterprise.

As in the previous year, this year's report also contains a detailed description of the value of steel. However, I think that information on how the Group acknowledges the social cost of generating this value should also be disclosed. Those outside the industry perceive the social cost as the massive volume of CO<sub>2</sub> emissions from blast furnaces during production, while the social value lies in the easy recyclability of steel and its indispensable role in building resilient infrastructure and creating low-carbon cities. Engineering businesses that leverage iron and steel technology, especially waste power generation and water treatment plants, also significantly contribute to reducing the environmental burden.

A Group-wide management strategy for minimizing the negative impact on climate change mitigation and increasing its contribution to climate change adaptation and moving toward decarbonization will likewise be important.

Climate change initiatives featured in the section starting on page 25 clearly demonstrate this strategy. The double-page spread on pages 25 to 26, spanning the period from 1990 to 2100, categorizes the technologies put to practical use, as well as various eco-products and businesses such as renewable energies, into "Addressing Risks" or "Seize the Opportunity." The chart, which displays the volume of CO<sub>2</sub> emissions and contribution to CO<sub>2</sub> reduction, illustrates the history of JFE Group's commitment to low carbon and decarbonization and how the Group will address these issues going forward in a way that is easy to understand. The chart not only presents historical details but also shows the change in CO<sub>2</sub> emissions based on several long-term scenarios developed with the assumption that CO<sub>2</sub> emissions will be zero by 2100. The analyses of two scenarios, based on TCFD recommendations, are also presented along with an assessment overview and a message from the officer in charge. This is to be highly commended as a valuable and advanced effort for deliberating over a long-term corporate strategy. The chart lays out how decarbonization could be achieved in a variety of ways, such as technological development leading to an innovative iron and steelmaking process, shifting to electric furnaces, providing eco-products such as a lighter steel plate, renewable energy plants, recycling plants, and energy-saving iron and steel technologies. It should be pointed out, however, that the associated risk analysis for these scenarios seems weak. Global climate hazards are becoming more severe at an alarming scale, even though the current temperature rise is 1°C. The impact under the 2°C or 4°C scenario and our ability to adjust to such change may be far beyond our imagination. I hope to see your bold analysis regarding potential risks. That could open up opportunities for the steel industry to establish new businesses for creating a resilient society.

As for current initiatives, KPIs have been set for each CSR materiality item identified in 2016. While the results achieved for 2018 show that KPI targets have been significantly exceeded in some environmental initiatives, almost the same KPIs were set for 2019. This may be because of the desire to leave some room for fluctuation considering technological volatility, but I sincerely hope this will not hinder progress in resource recycling. Since a long-term scenario was created based on TCFD, it should be used to define long-term KPIs for materiality items targeting 2030. Specifically, looking at the data for female advancement, the number of women in managerial positions exceeded the KPI target of tripling the FY2014 level to 3.3 times, and the target for FY2019 was raised to 5 times that of FY2014. Although we must take into account the fact that human resource strategies are essentially different from KPIs for environmental items, the challenges of addressing global warming, recycling resources, and conserving water resources are pressing issues. I advise you to consider setting specific numerical targets for environmentally sound products that could represent solutions for these concerns.

This year's report presents the commitment of the JFE Group to establish decarbonizing management. I look forward to the Group's actions for organizing its decarbonizing management system based on the TCFD scenario analysis and disclosures under TCFD guidelines for factors such as governance, risk management, and the setting of KPIs.



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The JFE Group CSR REPORT and JFE GROUP REPORT can also be viewed on smartphones.



● JFE Group  
CSR REPORT 2019



● JFE GROUP REPORT 2019

