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.

- **Basic Policy**

  As an enterprise engaged in iron and steel manufacturing, which is associated with emitting massive volumes of CO₂, 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 CO₂ emissions, has been developing various technologies for saving energy and reducing CO₂ emissions. Applying these to steel manufacturing has successfully reduced CO₂ 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.

### 1990s
- 1990: Kyoto Protocol adopted at COP3 in Kyoto
- 1997: Kyoto Protocol adopted at COP3 in Kyoto
- 2005: JISF’s Voluntary Action Plan launched
- 2013: JISF’s Commitment to a Low Carbon Society launched

### 2010s
- 2015: Paris Agreement adopted at COP21
- 2018: JISF announced the Long-term Vision for Climate Change Mitigation

### Environmental Movements across the World

#### 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)

The JFE Group leverages its innovative technology to address climate change and is committed to creating a resilient, sustainable society.
CO₂ Emissions Based on Long-term Scenarios for Climate Change Mitigation

- BAU/Simulation
- BAT Max Introduction Scenario
- Innovative Technologies Max Introduction Scenario

Super Innovative Technologies Development Scenario
- Low-level case
- Medium-level case
- High-level case

Total Emissions (Billion t-CO₂)

<table>
<thead>
<tr>
<th>Year</th>
<th>Low-level case</th>
<th>Medium-level case</th>
<th>High-level case</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>1.22 billion t-CO₂</td>
<td>1.62 billion t-CO₂</td>
<td>2.02 billion t-CO₂</td>
</tr>
<tr>
<td>2030</td>
<td>2.68 billion t-CO₂</td>
<td>3.29 billion t-CO₂</td>
<td>3.90 billion t-CO₂</td>
</tr>
<tr>
<td>2050</td>
<td>3.79 billion t-CO₂</td>
<td>4.48 billion t-CO₂</td>
<td>5.31 billion t-CO₂</td>
</tr>
<tr>
<td>2100</td>
<td>5.00 billion t-CO₂</td>
<td>6.50 billion t-CO₂</td>
<td>7.50 billion t-CO₂</td>
</tr>
</tbody>
</table>

Development of Technologies Specific to the Iron and Steel Sector

- EAF with waste minimization
- Hydrogen reduction iron making
- CCS
- Carbon recycling from byproduct gases

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

- Innovative Technologies Development Scenario
- BAU Max Introduction Scenario
- Innovative Technologies Max Introduction Scenario

Super Innovative Technologies Scenario
- Hydrogen reduction iron making
- CCS, CCU
- Carbon-free Power

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.

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 CO₂ 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 CO₂ reductions throughout steel’s entire life cycle.

Steel’s Tensile Strength Achieved as of 2019 (GPa)

- Automotive steel sheets
- Bridge cables
- Piano wires
- Steel cords

Theoretical potential 10.4 GPa

Source: Chart and text from the JISF.
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

<table>
<thead>
<tr>
<th>Element</th>
<th>JFE Holdings Disclosure (Corresponding Sections in this CSR Report)</th>
<th>Pages in CSR Report 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Governance</strong></td>
<td>a. Describe the board’s oversight of climate-related risks and opportunities</td>
<td>Corporate Governance System Outline</td>
</tr>
<tr>
<td></td>
<td>b. Describe management’s role in assessing and managing climate-related risks and opportunities</td>
<td>Risk Management System</td>
</tr>
<tr>
<td><strong>Strategy</strong></td>
<td>a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term</td>
<td>Results of scenario analysis</td>
</tr>
<tr>
<td></td>
<td>b. Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning</td>
<td>Results of scenario analysis</td>
</tr>
<tr>
<td></td>
<td>c. Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario</td>
<td>Results of scenario analysis</td>
</tr>
<tr>
<td><strong>Risk Management</strong></td>
<td>a. Describe the organization’s processes for identifying and assessing climate-related risks</td>
<td>Risk Management System, Framework for Environmental Management</td>
</tr>
<tr>
<td></td>
<td>b. Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization’s overall risk management</td>
<td></td>
</tr>
<tr>
<td><strong>Metrics and Targets</strong></td>
<td>a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process</td>
<td>KPIs for Material CSR Issues</td>
</tr>
<tr>
<td></td>
<td>b. Disclose Scopes 1 and 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions and related risks</td>
<td>CO2 Emissions of the JFE Group/ Greenhouse Gas Emissions in the Value Chain</td>
</tr>
<tr>
<td></td>
<td>c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets</td>
<td>KPIs for Material CSR Issues</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Selected Scenario</th>
<th>2°C Scenario</th>
<th>4°C Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Scenario</td>
<td>Transition scenarios developed by the IEA</td>
<td>Transition scenarios developed by the IEA</td>
</tr>
<tr>
<td>Risks</td>
<td>Sustainable Development Scenario (SDS)*1</td>
<td>New Policies Scenario (NPS)*2</td>
</tr>
<tr>
<td></td>
<td>2°C Scenario (2DS)*3</td>
<td>Reference Technology Scenario (RTS)*2</td>
</tr>
<tr>
<td>Physical Risks</td>
<td>Climate change projection scenario developed by the Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathways (RCP) Scenario*4</td>
<td></td>
</tr>
</tbody>
</table>

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.

1. World-wide/industry-wide uniform carbon pricing*
2. Increase in the ratio of sales of electric vehicles to overall vehicle sales
3. Sea level rise
4. Increase in the occurrence of flooding
5. Damage to production bases and offices caused by climatic hazards
6. National resilience
7. Unstable raw materials procurement due to increased occurrence of climatic hazards
8. Damage to production bases and offices caused by climatic hazards
9. Increase in demand for automotive steel, etc.
10. Decarbonization of iron and steelmaking process
11. Increase needs for effective utilization of steel scrap
12. Increase in demand for solutions to promote decarbonization

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.

<table>
<thead>
<tr>
<th>Level of impact</th>
<th>Expectations and concerns of stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>◆ Level of impact (possibility of risks and opportunities arising)</td>
<td></td>
</tr>
<tr>
<td>◆ Expectations and concerns of stakeholders</td>
<td></td>
</tr>
</tbody>
</table>

Key factors are identified
### Results of Scenario Analysis

<table>
<thead>
<tr>
<th>Changes in Society and Response</th>
<th>Stakeholder Expectations and Concerns for the JFE Group</th>
<th>Results of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2°C Scenario</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Key Factor 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decarbonization of Iron and Steelmaking Process</td>
<td>Implement innovative technology to realize decarbonization at a large scale</td>
<td><strong>Opportunity</strong> Develop and put into practical use innovative technologies in addition to existing ones</td>
</tr>
<tr>
<td></td>
<td>Introduce carbon price</td>
<td><strong>Risk</strong> Investment on implementing innovative technologies is feasible</td>
</tr>
<tr>
<td><strong>2°C Scenario</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Key Factor 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased Needs for Effective Utilization of Steel Scrap</td>
<td>Increasing interest for electric furnace method for its lower CO₂ emissions</td>
<td><strong>Opportunity</strong> Converter furnace steelmaking is increasing due to constraint on the supply of scrap</td>
</tr>
<tr>
<td></td>
<td>Increasing expectations for electric furnace steel</td>
<td><strong>Opportunity</strong> Expansion in electric furnace steelmaking and electric furnace engineering</td>
</tr>
<tr>
<td></td>
<td>Increasing volume of scraps generated</td>
<td><strong>Opportunity</strong> Expansion in scrap logistics business</td>
</tr>
<tr>
<td><strong>2°C Scenario</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Key Factor 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in Demand for Automotive Steel</td>
<td>Increasing demand for EV motors</td>
<td><strong>Opportunity</strong> Increase in demand for electrical steel sheets due to increase in electric vehicles</td>
</tr>
<tr>
<td></td>
<td>Decreasing demand for internal-combustion engines</td>
<td><strong>Opportunity</strong> Increase in demand for special steel due to increased car sales</td>
</tr>
<tr>
<td></td>
<td>Cars are lighter in weight and use multi-materials</td>
<td><strong>Opportunity</strong> Increase in demand for high tensile strength automotive steel sheets</td>
</tr>
<tr>
<td></td>
<td>Demand for eco-friendly materials</td>
<td><strong>Risk</strong> Effect of trend to use multi-materials is limited</td>
</tr>
<tr>
<td><strong>2°C Scenario</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Key Factor 4</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in Demand for Solutions to Enhance Decarbonization</td>
<td>Transition to decarbonized society</td>
<td><strong>Opportunity</strong> Entire construction and operation of renewable energy plants (biomass, geothermal, and solar power generation)</td>
</tr>
<tr>
<td></td>
<td>Increasing demand for solutions to promote the transition</td>
<td><strong>Opportunity</strong> Entire construction of CCU/CCS facilities</td>
</tr>
<tr>
<td></td>
<td>Overseas expansion of energy-saving technologies</td>
<td><strong>Overseas expansion of low-carbon business</strong></td>
</tr>
<tr>
<td><strong>4°C Scenario</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Key Factor 5</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unstable Raw Materials Procurement due to Increased Occurrence of Climatic Hazards</td>
<td>Increasingly devastating climate hazards caused by temperature rise</td>
<td><strong>Risk</strong> Ongoing specific measures: - Diversify supply sources - Increase plant capacity</td>
</tr>
<tr>
<td></td>
<td>Raw materials procurement becomes unstable</td>
<td><strong>Risk</strong> Measures against flood and drought are already in progress</td>
</tr>
<tr>
<td><strong>4°C Scenario</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Key Factor 6</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damage to Production Bases and Offices Caused by Climatic Hazards</td>
<td>Increasingly devastating climate hazards caused by temperature rise</td>
<td><strong>Risk</strong> Impact of flooding caused by sea level rise can be addressed with current countermeasures</td>
</tr>
<tr>
<td></td>
<td>Increasing the importance of enhancing infrastructure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increasing demand for disaster mitigation products</td>
<td><strong>Opportunity</strong> Reinforce infrastructure with steel and other relevant products</td>
</tr>
<tr>
<td><strong>4°C Scenario</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Key Factor 7</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Resilience</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
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 CO₂ 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 CO₂ 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 into practice after 2050 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.

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 CO₂ 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.
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 CO₂ emissions from cars in motion.

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 CO₂ 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 construction of recycling plants from design to procurement and construction to 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 CO₂. 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 CO₂ reduction achieved by internationally transferring and disseminating advanced energy-saving technologies widely used in Japan will exceed 400 million t-CO₂ world-wide. Japan is estimated to contribute to the reduction of approximately 80 million t-CO₂ in 2030 through these technologies.
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.
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.

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.
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.

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.

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 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.

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.

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.

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 onsite 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.

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### Breakdown of Environmental Costs

<table>
<thead>
<tr>
<th>Main Items</th>
<th>FY2017</th>
<th>FY2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Investment (billion yen)</td>
<td>Cost (billion yen)</td>
</tr>
<tr>
<td>Management</td>
<td>Impact monitoring and measurement, and EMS expenses and education</td>
<td>0.2</td>
</tr>
<tr>
<td>Global warming countermeasures</td>
<td>Saving and efficiently using energy</td>
<td>18.0</td>
</tr>
<tr>
<td>Conservation of natural resources</td>
<td>Recycling industrial water</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Recycling and waste management of internally generated materials, etc.</td>
<td>0.09</td>
</tr>
<tr>
<td>Environmental protection</td>
<td>Air pollution countermeasures</td>
<td>19.1</td>
</tr>
<tr>
<td></td>
<td>Water pollution countermeasures</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Prevention of soil contamination, noise, vibration, and subsidence</td>
<td>0.02</td>
</tr>
<tr>
<td>Other</td>
<td>Charges, etc.</td>
<td>—</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Technologies for protecting the environment, saving energy, and preventing global warming</td>
<td>1.4</td>
</tr>
<tr>
<td>Societal activities</td>
<td>Support for nature preservation and forestation, information disclosure, exhibitions, and public relations</td>
<td>—</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43.3</strong></td>
<td><strong>112.1</strong></td>
</tr>
</tbody>
</table>

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 CO2 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.
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.
Consumed by JFE Steel

Supply to Society

Recovered energy for recycling
- Byproduct gas
- Waste heat recovery steam
- Power generation by blast furnace (BF) top gas-pressure recovery turbine (TRT)

Effective use of recovered energy 100%

Output and Emissions

JFE Engineering (Head Office and Works)

Input

<table>
<thead>
<tr>
<th>Energy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric power</td>
<td>26.8</td>
</tr>
<tr>
<td>Class A heavy oil</td>
<td>330.2</td>
</tr>
<tr>
<td>Kerosene</td>
<td>12.6</td>
</tr>
<tr>
<td>Light oil</td>
<td>221.7</td>
</tr>
<tr>
<td>Gasoline</td>
<td>14.8</td>
</tr>
<tr>
<td>City gas</td>
<td>357,800 Nm³</td>
</tr>
<tr>
<td>LPG</td>
<td>118.8</td>
</tr>
</tbody>
</table>

Water

101,700 tonnes

Output

Steel products
26.3 million tonnes (crude steel base)

Other products
- Chemicals
- Oxygen
- Nitrogen
- Hydrogen
- Argon

Marine and land civil engineering materials
9.2 million tonnes
- Materials for cement
- Roadbed materials
- Port and harbor construction materials
- Fertilizer

Recycled products
- NF Board™
- PET flakes
- Palettes
- Recycled resin

Tourism, Environment and Society

Steel
47,300 tonnes

Energy

CO₂
13,800 tonnes CO₂
- Scope 1
6,800 tonnes CO₂
- Scope 2
7,000 tonnes CO₂

Waste generated
1,500 tonnes
- Industrial wastes
1,200 tonnes
- General wastes
318 tonnes

Wastewater (ocean only)
146,000 tonnes

Others (PRTR)
175 tonnes
Protecting the Global Environment

Climate Change Mitigation

Basic Approach
The JFE Group’s business involves steel manufacturing, which emits large amounts of CO₂. 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 CO₂ emissions, has developed many technologies for saving energy and reducing CO₂ emissions and has adopted them in its steel manufacturing process. As a result, CO₂ 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.

CO₂ Emissions of the JFE Group
JFE’s CO₂ emissions are mainly generated by its steel business. However, beyond reducing CO₂ emissions from steel production process, each company sets specific targets corresponding with their operations to further save energy and reduce CO₂ emissions.

<table>
<thead>
<tr>
<th>CO₂ Emissions of the JFE Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Million t-CO₂)</td>
</tr>
<tr>
<td>Scope 1</td>
</tr>
<tr>
<td>2014</td>
</tr>
<tr>
<td>2015</td>
</tr>
<tr>
<td>2016</td>
</tr>
<tr>
<td>2017</td>
</tr>
<tr>
<td>2018</td>
</tr>
</tbody>
</table>

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 CO₂ emissions from non-energy sources. Starting with FY2018, data for JFE Steel’s subsidiaries and JFE Engineering’s subsidiary include CO₂ emissions from non-energy sources.

CO₂ Emissions by Operating Company (FY2018)

<table>
<thead>
<tr>
<th>Category</th>
<th>JFE Steel</th>
<th>JFE Engineering</th>
<th>JFE Shoji Trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>59,357 thousand t-CO₂</td>
<td>212 thousand t-CO₂</td>
<td>36 thousand t-CO₂</td>
<td></td>
</tr>
<tr>
<td>99.58%</td>
<td>0.36%</td>
<td>0.06%</td>
<td></td>
</tr>
</tbody>
</table>

Scope 3 Emissions of the JFE Group (FY2018)

<table>
<thead>
<tr>
<th>Category</th>
<th>Emissions (FY2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1: Purchased goods and services</td>
<td>13,371</td>
</tr>
<tr>
<td>Category 2: Capital goods</td>
<td>1,180</td>
</tr>
<tr>
<td>Category 15: Investments</td>
<td>1,180</td>
</tr>
<tr>
<td>Total</td>
<td>16,749 thousand t-CO₂</td>
</tr>
</tbody>
</table>

Energy Savings and CO₂ Reduction in Iron and Steelmaking

**Initiatives to Save Energy and Reduce CO₂**
JFE Steel has always aggressively pursued CO₂ reduction and energy savings, including the introduction of energy-saving equipment.

**Energy Consumption and CO₂ Emissions in FY2018**
Energy consumption and CO₂ 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 CO₂ 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 CO₂ 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 CO₂ emission intensity was down 18% to 2.02 t-CO₂/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](image)

**Energy Consumption and Unit Energy Consumption of JFE Steel**

![Energy Consumption and Unit Energy Consumption of JFE Steel](image)

**CO₂ Emissions of JFE Steel Group**

![CO₂ Emissions of JFE Steel Group](image)

**CO₂ Emissions from Non-energy Sources**

Lime and dolomite, which are used as auxiliary materials in blast furnaces and converters, emit CO₂ in decomposition.

![CO₂ Emissions from Non-energy Sources of JFE Steel](image)
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**
  - Promotion and expansion of The Three Ecos Initiatives
  - Development and implementation of innovative new iron and steelmaking processes

- **Long-term (-2050) Initiatives**
  - Promotion of innovative new iron and steelmaking processes
  - Development of super innovative iron and steelmaking processes and CCS/CCU technologies

- **End (-2100) Vision**
  - Realization of zero-carbon steel
  - Implementation of super innovative iron and steelmaking processes

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-CO₂ 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.

Revolutionary Iron and Steelmaking Process Development
**COURSE50**
About 30% of CO₂ emissions can be reduced through hydrogen reduction along with separation and capture of CO₂ 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

<table>
<thead>
<tr>
<th>CO₂ Reduction Medium- to Long-Term Targets (Japan Iron and Steel Federation’s “Commitment to a Low Carbon Society”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Ecos</td>
</tr>
<tr>
<td><strong>Goal</strong></td>
</tr>
<tr>
<td><strong>Targets</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Status as of FY2017 year-end</strong></td>
</tr>
</tbody>
</table>

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

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 CO₂ 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 CO₂ 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 CO₂ 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.

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 CO₂ 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.
**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.

**CO2 Reduction Initiatives**

**Initiatives towards CCU/CCS**

In order to reduce CO2 emissions from the steel manufacturing process, JFE Steel is actively engaged in the development of new technologies to separate and recover CO2 from blast furnace gas. This is in line with the JISF’s COURSE50 project (CO2 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 CO2 from blast furnace gas. JFE Steel has been working on developing for practical use a physical adsorption technology for separating and capturing CO2, 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 CO2 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*1 projects for the development of next-generation thermal power generation technologies / development of basic technologies for next-generation thermal power generation / development of CO2 utilization technology project, and as such, it is working on an initiative together with RITE*2 to develop new technologies for separating and recovering CO2 from blast furnace gas and utilizing it to synthesize methanol (CH3OH).

In this project, JFE Steel is developing technologies that lower the cost of CO2 separation and recovery that meets the objectives of CCU and process design for effective CO2 utilization. The expertise in CO2 separation and recovery technologies it has acquired through the COURSE50 project is applied to CCU.

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.

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*1 New Energy and Industrial Technology Development Organization
*2 Research Institute of Innovative Technology for the Earth
JFE Engineering strives to reduce CO₂ 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 CO₂ reduction would mount up to 4.12 million tonnes per year. Furthermore, JFE Engineering strives to reduce its own CO₂ emissions in accordance with the Energy Conservation Law, from its head office, branch offices, and works.

In FY2018, CO₂ 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 CO₂ emissions.

*For renewable energy power generation plants, the characteristics of each plant are taken into consideration while estimating their CO₂ emissions.

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.

The graph shows CO₂ emissions from electric power consumption by JFE Shoji Trade and 33 consolidated subsidiaries (steel-processing companies) in Japan and overseas.

Disclosure of CO₂ 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 CO₂ Emissions

**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.

**Ultra-narrow-gap J-STAR™—a High-weldability CO₂ Arc-welding Technology**

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

On the other hand, CO₂ arc welding*2 uses a lower heat input and therefore causes less deformation. Nevertheless, it is less efficient. JFE Steel improved this CO₂ 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 CO₂.

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% CO₂ for the shielding gas.

**Use of Granulated Blast Furnace Slag to Reduce CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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.

<table>
<thead>
<tr>
<th>CO₂ Emission for Producing 1 Tonne of Cement (Unit: kg CO₂)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂ Emission Source</td>
</tr>
<tr>
<td>Limestone</td>
</tr>
<tr>
<td>Electricity</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

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

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)
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 Electric power 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.

Wood pellets are considered to be ideal as a biomass fuel for renewable energy since the CO₂ emitted by burning them is offset by the CO₂ 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.

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 CO₂ 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.
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.

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.

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.

**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**

- Amount released into atmosphere and public waterways by JFE Steel (non-consolidated)
- Amount transferred by JFE Steel (non-consolidated)

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount Released (Tonnes)</th>
<th>Amount Transferred (Tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>58.4</td>
<td>5.7</td>
</tr>
<tr>
<td>2015</td>
<td>386</td>
<td>413</td>
</tr>
<tr>
<td>2016</td>
<td>381</td>
<td>269</td>
</tr>
<tr>
<td>2017</td>
<td>5,048</td>
<td>4,835</td>
</tr>
<tr>
<td>2018</td>
<td>6,208</td>
<td>6,643</td>
</tr>
</tbody>
</table>

*18 JFE Steel 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)

#### 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 m³/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

#### 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 denitrification 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 Rendering](image)

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For further information, please refer to the official JFE Group CSR Report 2019.
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.

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.

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.

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.
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.

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 Fukuyma 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.

- 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 CO₂ 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.
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](image)

*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](image)

Data cover JFE Engineering and 7 consolidated subsidiaries in Japan.
Reducing Generation and Emission of Co-products and Reusing Co-products

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.

Promoting Recycling

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.

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.
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.

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.

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.
### Social challenges for resource recycling

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

### Initiatives for Resource Recycling Solutions

#### Solution 1
- Recycling fluorescent lights, batteries, home electronic appliances, etc. (treating hazardous materials for recycling)

#### Solution 2
- Recycling food waste, biogas generation from sludge

#### Solution 3
- Recycled plastic products such as palettes and NF boards

#### Solution 4
- Waste power generation, biomass power generation

### Recycling resources

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

### Offering recycled products

- Recycled plastic products such as palettes and NF boards

### Using renewable energy sources

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

### Efficient use of co-products

- For cement material, etc.

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### Steelworks

- Steel products
- Efficient use of co-products
- Byproduct energy

### Recycle business

- Recycled resources
- Recycled products
- Renewable energies

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### Byproduct energy

- Electrode
- Arc
- Molten steel

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### Recycle business

- Waste scrap

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### Solution 6

- Technologies to inject plastic in blast furnaces

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### Customer/User

- Product → Use → Dispose

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### Initiative 1

- 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 use of recycled resources and recycling of resources.

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### Initiative 2

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

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### Initiative 3

- 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.

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### Initiative 4

- Collaboration with administrative entities
  
  Established a new local-based power company in collaboration with an administration to promote 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.

**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.

  ![ecobeing](http://www.ecobeing.net)

- **Sponsoring “Midori no Komichi” Environmental Diary**
  The JFE Group sponsors the “Midori no Komichi” 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.

  ![Midori no Komichi](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.

![EcoPro 2018](http://www.jfe.co.jp)

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

![EcoPro EcoKids Tour](http://www.jfe.co.jp)

Children deeply interested in diorama.

![Marine Block](http://www.jfe.co.jp)

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