Corporate Philosophy

Nippon Steel Corporation Group will pursue world-leading technologies and manufacturing capabilities, and contribute to society by providing excellent products and services.

- We continue to emphasize the importance of integrity and reliability in our actions.
- We provide products and services that benefit society, and grow in partnership with our customers.
- We pursue world-leading technologies and manufacturing capabilities.
- We continually anticipate and address future changes, innovate from within, and pursue unending progress.
- We develop and bring out the best in our people to make our Group rich with energy and enthusiasm.

Nippon Steel adopts its own new initiative “Nippon Steel Carbon Neutral Vision 2050 — A Challenge of Zero-Carbon Steel”, as a part of our widespread efforts toward achieving a decarbonized society. We will consider and implement various measures as a top priority management issue in order to continue to lead the world’s steel industry.

Editorial policy

This Sustainability Report is the 24th since the former Nippon Steel Corporation issued what is the first sustainability report by a Japanese steel manufacturer, in 1998. We believe it is extremely important to promote business activities that contribute to the realization of a sustainable society. We are therefore committed to diverse initiatives based on this idea. In this report, in order to clearly express our approach toward helping realize a sustainable society, we present our Environment, Social, and Governance (ESG) initiatives, which we consider to form the basis for supporting our sustainable growth. To augment the details, we added representative examples. Please use the link to the relevant website URL on each page to see more details.

The period covered in the report is fiscal 2020 (from April 2020 to March 2021). For some activities, the period from April 2021 to June 2021 is included.

Boundary of report

- Environmental and social aspects: Activities of Nippon Steel and its group companies in Japan and overseas
- Economic aspects: The Integrated Report 2021 of Nippon Steel (issued in August 2021) also covers the contents of the economic report.

Reference for guidelines

- GRI (Global Reporting Initiative) Standards
- “Environmental Reporting Guidelines 2018” by the Ministry of the Environment
- Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), established by the Financial Stability Board
Message from the President

I would like to thank our shareholders and all other stakeholders for your understanding and support to the Nippon Steel Group. In March of this year, we announced a new medium- to long-term management plan, with the aim of continuing to grow to "become the best steelmaker with world-leading capabilities," that supports Japan’s industrial competitiveness. One affirmative policy in the plan is our approach to the "Challenge to Zero Carbon Steel." We have identified the challenge as being to radically reduce CO₂ emissions through the development of breakthrough technologies and believe this to be our greatest priority issue. Our basic approach is to win the development competition with other countries and continue to lead the world's steel industry. Through these efforts, we are committed to establishing a virtuous cycle of environmental sustainability and corporate growth and improving corporate value.

In this Sustainability Report 2021 we are pleased to present to you a description of our “Challenge toward Zero Carbon Steel” and other wide-ranging initiatives in regard to the Environment, Social, and Governance (ESG) issues we face as we advance toward realizing a sustainable society.

Environmental initiatives

Having positioned environmental matters as priority issues that underlie our corporate management as stated in our Basic Environmental Policy, we have pledged to contribute to the creation of a society oriented toward environmental preservation and with low environmental impact. We continue to proactively undertake diverse environmental issues concerning wide-ranging areas of concern, from local communities to the entire planet, including climate change issues, creation of a circular economy, and maintenance and enhancement of a favorable living environment. While we are advancing initiatives for the Sustainable Development Goals (SDGs) adopted by the United Nations, we recognize climate change issues as a priority problem that may threaten survival of the human race. The Challenge to Zero Carbon Steel has two aspects. The first aspect is our action to contribute widely to the realization of a green society through providing users with our technology and products in Japan and overseas. This also a business opportunity for us. As an upfront investment in this effort, we have decided to make investment in improving the capacity and quality of electrical steel sheets, and in building a next-generation hot-rolling mill at the Nagoya Works.

The second aspect is a challenge to develop a new production process aimed at radically reducing CO₂ emissions in the manufacturing process. This requires a challenging advanced technical development, including in unplanned areas. This is by far the most difficult challenge in the history of the steel industry. We are taking this dramatic change in the business environment as a great opportunity to realign our business strategy and enhance competitiveness. We are making a dedicated effort to develop zero-carbon steel technology and thereby contribute to the realization of a low-emission society.

Innovation Fund, we will boldly take up the challenge to develop zero-carbon steel technology.

With regard to biodiversity preservation, we have long been involved in measures from both hard and soft aspects to reduce environmental burden. In addition to compliance with laws and regulations, we strictly adhere to the ordinances and standards of municipalities, and give due consideration to the conditions of each region. We are also taking measures to enhance the introduction of business activities that respect diverse social initiatives.

Social initiatives

We believe in our Corporate Philosophy of contributing to the development of society and to be continually trusted by everyone, we are committed to fulfilling our social responsibility.

In this report, we are presenting our engagement with various stakeholders as well as our response to social issues. Specific themes include the death, disaster prevention, and quality, respect for human rights, diversity and inclusion, supply chain management, and coexistence with the community and society. Compared to the report of last year, we have enhanced the introduction of business activities that respect diverse values and human rights issues, and of diversity and inclusion.

In order to live up to our Corporate Philosophy of contributing to the development of society and to be continually trusted by everyone, we are committed to fulfilling our social responsibility.

Towards enhancement of governance and sustainable growth of the company

We have developed a corporate governance system suitable for the Group’s business in order to promote sound and sustainable growth and to improve medium- to long-term corporate value. Since 2020, we have changed our corporate structure to that of a Company with an Audit & Supervisory Committee, etc. and have been working to speed up management decision-making and strengthen the supervisory function of the Board of Directors.

We continue to prevail as a company that helps solve diverse social issues and issues, which form the base that supports sustainable corporate growth. We have identified key ESG challenges (maturity) that should be addressed in a focused manner, with due consideration to our corporate principles, values, stakeholders’ expectation, and our growth strategy. We intend to steadily promote its execution and follow-up by checking Key Performance Indicators to assess outcomes.

We hope that you take a look at this report and let us know your feedback.

Eiji Hashimoto
Representative Director and President

Towards the Realization of a Sustainable Society, and the SDGs
Steel is an abundant, sustainable material that can be reborn endlessly

Iron is believed to constitute one-third of the Earth’s weight.

Steel is an affordable material and is cheaper than water in a plastic bottle (in comparing price per unit weight).

Steel represents 90% or more of metal products, as steel being abundant, cheap, and having good workability, and has a wide range of applications.

Steel is easily sorted from a mixture with other materials and can be endlessly recycled without causing deterioration in quality—quite a unique characteristic. Steel is a perfect material for recycling as it can be recycled endlessly into all kinds of steel products after the end of its product life.

Diverse properties and a wide range of applications

Due to diverse advantages such as strength and machinability to work, steel has been used in a wide range of applications and deserves recognition as the most outstanding material for the infrastructure of society, a material that supports people’s lives and overall economic development.

Steel is close to us and we cannot live without steel products. Steel is supports people’s lives and overall economic development. Steel is an abundant, sustainable material that can be reborn endlessly Steel is an outstanding material from the Life Cycle Assessment (LCA) perspective

Diverse properties that support a wide range of applications

Steel is a material with great potential due, in part, to its having a much higher theoretical strength than other materials.

In addition to adjusting carbon and other content to give a certain steel product specific desired characteristics, steel’s properties can be finely controlled to meet function and performance requirements, including requirements that did not exist in the past. We do this by controlling the combination of its temperature and rolling at the manufacturing stage or by adding alloys. Further development in steel and its usage will push the potential horizon further outward.

Steel is a sustainable material to be reborn in new steel products endlessly

Steel is an outstanding material from the Life Cycle Assessment (LCA) perspective

Some materials have low environmental impact in use but may have high environmental impact in the overall life cycle.

The Life Cycle Assessment (LCA) is therefore important.

Environmental impacts of steel made via the BF and EAF routes, using an LCA approach

The blast furnace (BF) route to reduce iron ore to make steel may appear to generate a higher environmental impact than the method that melts steel scrap in an electric arc furnace (EAF) to make steel. However, the BF route creates steel products that generate scrap that, through recycling, has an effect of CO2 emission reduction. As that scrap recycling effect offsets the CO2 emissions in the BF process, environ-mental impacts of the BF and EAF routes in total terms are the same as steel is repeatedly recycled.

The Life Cycle Assessment method (LCA) is a way of thinking to evaluate environmental impact of a product over its entire life cycle. While many aspects of environmental impact cannot be seen, the LCA is an attempt to visualize the impact over the life cycle of a product, from production of its raw material to use, disposal and recycling of the end product.

From the LCA perspective, steel’s environmental impact can be said to be very low relative to other materials. In order to continue to supply steel as a sustainable material, while taking advantage of its excellent LCA characteristics, we aim to realize zero-carbon steel.

Environmental impacts of steel made via the BF and EAF routes, using an LCA approach

Steel is one of the most familiar materials and is indispensable for our daily lives. Thanks to its diverse properties and infinite potential, steel will continually contribute to a sustainable society.
Nippon Steel Group’s Businesses

Domestic Manufacturing and R&D Bases (Nippon Steel)

Nippon Steel is engaged in production at six steelworks — Muroran, East Nippon, Nagoya, Kansai, Setsuchi, and Kyushu — and R&D activities in three centers in Futsu, Hasaki, and Amagasaki.

Overseas Manufacturing Bases

The Nippon Steel Group has established a global supply network of 34 million tons in steel processing capacity, mainly for use of automobiles, resources and energy, infrastructure, and electric appliances, containers, etc.

Business segments

Based on the long accumulation of technology through steelmaking, the Nippon Steel Group operates businesses in four areas: steelmaking and fabrication, engineering and construction, chemicals and materials, and system solutions, with the core business being steelmaking.

Chemicals and Materials Business

¥1,786.6 bn

Nippon Steel Chemical & Material Co., Ltd.

Nippon Steel Chemical & Materials aims to contribute to society by combining chemical and material operations and utilizing its original material technologies. With coal chemicals, chemical, functional materials and composite materials in its four main operating sectors, this company pursues sustainable growth by creation of new businesses, overseas expansion of its core operations, and the further promotion of global operations.

System solutions business

¥2,524.6 bn

NS Solutions Corporation

In keeping with the advent of widespread use of digital innovations in IT for business, NS Solutions provides IT business solutions, including use of the cloud, IoT, and AI, to a wide range of sectors by applying its extensive insights and advanced practical IT capabilities acquired in the steel manufacturing business.

Steelmaking and fabrication business

¥4,428.4 bn

Nippon Steel Corporation

Enhancing technological capabilities, Nippon Steel provides a variety of high-grade steel products (i.e., steel plates, flat products, bars & wire rods, construction products, pipes & tubes, railway, automotive & machinery parts, and titanium stainless steel) to many customers in Japan and overseas.

Sales composition by region

Net sales/Revenue (consolidated basis) (¥ billion)

<table>
<thead>
<tr>
<th>Region</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>6,622.9</td>
<td>6,773.4</td>
<td>6,975.9</td>
<td>7,417.5</td>
<td>9,092.7</td>
</tr>
<tr>
<td>Overseas</td>
<td>4,632.8</td>
<td>5,091.6</td>
<td>5,921.5</td>
<td>6,177.9</td>
<td>7,076.7</td>
</tr>
</tbody>
</table>

Ordinary profit / Business profit (consolidated basis) (¥ billion)

<table>
<thead>
<tr>
<th>Period</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2016</td>
<td>174.6</td>
<td>174.0</td>
<td>204.8</td>
<td>234.7</td>
<td></td>
</tr>
</tbody>
</table>

Net income / Profit attributable to owners of the parent (consolidated basis) (¥ billion)

<table>
<thead>
<tr>
<th>Period</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2016</td>
<td>105.796</td>
<td>106.599</td>
<td>106.226</td>
<td>105.796</td>
<td>106.599</td>
</tr>
</tbody>
</table>

Crude steel production volume (non-consolidated basis) (million tons)

<table>
<thead>
<tr>
<th>Period</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2016</td>
<td>36.00</td>
<td>36.50</td>
<td>36.50</td>
<td>36.50</td>
<td>36.50</td>
</tr>
</tbody>
</table>

Net sales/Revenue (consolidated basis)

2016 2017 2018 2019 2020

Ordinary profit / Business profit (consolidated basis)

2016 2017 2018 2019 2020

Net income / Profit attributable to owners of the parent (consolidated basis)

2016 2017 2018 2019 2020

Crude steel production volume (non-consolidated basis)

2016 2017 2018 2019 2020

It is noted that each steelworks has an equity stake of over 30% in each other's steelworks and affiliated companies. The capacity of each steelworks' steelmaking operations is estimated at 20 million tons.
Nippon Steel Group's Contribution to SDGs

Steel contributes to make our life more convenient and pleasant, by being used everywhere in our life and society, and as an indispensable part of resilient infrastructure against natural disasters caused by earthquakes, abnormal weather driven by climate change, and other factors. Steel is also an indispensable material element for achieving SDGs, as it helps reduce environmental impact due to its weight reduction, extension of its product life, etc., in top of being abundantly available and able to be recycled. As a supplier of steel, we strive to implement our ‘Three Ecos and Innovative technologies as measures against climate change. We also promote sustainable measures so as to not waste resources. These measures include use of by-product gas generated in steelmaking, reuse of recycled materials and materials for civil engineering, use of steel slag in road materials, etc. As a supplier of steel, we strive to implement our Three Ecos and innovative technologies as measures against climate change.

Examples of specific initiatives

<table>
<thead>
<tr>
<th>No.</th>
<th>Specific Initiatives</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Full-scale launch of the “Creation of Sea Forest,” a project for regeneration of seaweed beds by use of steel slab in fertilizers for sea areas, in Tomari, Hokkaido.</td>
<td>February 2021</td>
</tr>
<tr>
<td>2.</td>
<td>Launch of an application verification of the owned wireless network base station in view of local SG to promote DX in the steelmaking site</td>
<td></td>
</tr>
</tbody>
</table>
Nippon Steel's ESG Materiality and KPIs

Concerning initiatives in ESG materiality, Nippon Steel steadily promotes their execution and follow-up by checking the Key Performance Indicators (KPI) to assess outcome, and strives to contribute to sustainable social development, as well as maintenance and improvement of our corporate value.

Materiality KPIs and status of major initiatives

<table>
<thead>
<tr>
<th>Materiality</th>
<th>Key Performance Indicator (KPI)</th>
<th>Major Initiatives and Achievements in FY2020 (including some results in FY2019)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Safety, environment, and disaster prevention</td>
<td>Accident frequency rate of 0.10 or less</td>
<td>• Provision of safe and healthy working conditions based on the safety risk evaluation</td>
<td>p. 45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Prevention of fire and industrial accidents</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Zero serious disaster-related accident</td>
<td>p. 46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Risk assessment to detect new disaster risks; execution of measures from hard/soft aspects to reduce risk and control residual risk</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Implementation of “Eco Process” to improve the energy efficiency of power plants</td>
<td></td>
</tr>
<tr>
<td>2. Quality</td>
<td></td>
<td>• Continuous execution of corporate philanthropy in the support of music via Nippon Steel Arts Foundation</td>
<td>p. 60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Support of music activities via presentation of Nippon Steel Music Awards and operation of the Kioi Hall</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Human resources, diversity &amp; inclusion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Harmony with local communities and society</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Corporate value enhancement and profit distribution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Process to identify materiality

Considerer requests from stakeholders, social issues and listing candidate issues

Generalize the issues in due consideration of the company's corporate philosophy and values

Verify the issues from the viewpoint of the company's value creation process and strategy

Discuss and approve the issues in the viewpoint of the Board of Directors meeting

Adhering to laws and regulations as a base of all activities

"Corporate Governance" Integrated Report pp. 90-102

"Operating financial performance" Integrated Report pp. 61-64


"Integrated Report" pp. 51-104

"Environmental Initiatives" pp. 29, 31

"Environmental risk management" pp. 47, 48

"ESG risk management" pp. 15-23


"Integrated Report" pp. 61-64

"NIPPON STEEL CORPORATION" Integrated Report pp. 50-54

"Operating and financial performance" Integrated Report pp. 47, 48

"Risk assessment to detect new disaster risks; execution of measures from hard/soft aspects to reduce risk and control residual risk | |

"Consideration of social responsibilities for subcontracting companies regarding local communities and society" Integrated Report pp. 89-102
Environmental Initiatives

Nippon Steel’s Environmental Management

Basic Environmental Policy

Under the principle of “Ecological Management,” Nippon Steel is committed to contributing to the creation of an environmental-preservation-oriented society with lower environmental impact. For this purpose, the company will conduct business activities based on the viewpoint of environmental preservation in local communities, which includes the maintenance and improvement of good living environments and the promotion of reduction and recycling of waste. The company will also address challenges on a global scale including response to issues of global warming as well as the maintenance and improvement of biological diversity.

1. Reducing environmental impacts at every stage of operations (Eco Process)
2. Offering of environment-oriented products (Eco Products)
3. Proposing environmental preservation solutions from a global perspective (Eco Solution)
4. Development of innovative technologies
5. Development of a rich environment
6. Promotion of environmental relations activities

Environmental Management Action Plans

Nippon Steel has established its Environmental Management Action Plans based on its Basic Environmental Policy and has been working on diverse environmental challenges in five priority areas.

Promotion of measures against climate change
- Promotion of the Carbon Neutral Vision 2050, centered around the Zero-Carbon Steel Project
- Domestic and overseas collaboration in innovative technology development
- Participation in and recommendations of discussions on environmental and energy policies
- Continuing promotion of the “Voluntary Action Plan/Commitment to a Low Carbon Society” as an activity of the Japan Iron and Steel Federation

Creation of a recycling-based society
- Expand effective use of in-house generated resources; promote zero emission
- Promote recycling of outside waste (waste plastics)

Environmental risk management
- Promote company-wide discussion on environmental risk issues
- Respond to new environmental regulations

Environmental relationship activities
- Communicate actively with stakeholders on environmental issues
- Appropriate and timely disclosure of environmental information and dialogue (engagement)
- Secure bio-diversity and work for harmony with nature
- Provide opportunities to study the environment to people outside the company (i.e., sending lecturers)

Environmental management system
- Enhance the environmental administrative system (i.e., environmental audits, plant audits)
- Conduct environmental management in coordination with group companies
- Promotion of the environmental education and human resource development (enhancement of environmental education tools, etc.)
- Promotion of digital transformation in the environmental field

Three ecos and innovative technology development to contribute to SDGs

Nippon Steel is promoting environmental management centered around the four basic orientation of the three ecos and the company’s innovative technology development, as stipulated in the Basic Environmental Policy. We aim at achieving Sustainable Development Goals (SDGs) by promoting the Environmental Management Action Plans.

Going forward, from the perspective of SDGs, we will keep identifying and working on issues for which we can contribute through our business.

Three ecos and innovative technology development

Sustainable Development Goals (SDGs)

Environmental Management Action Plans
Coping with Climate Change

Nippon Steel Carbon Neutral Vision 2050
Challenge of Zero-Carbon Steel

Adapting the "Nippon Steel Carbon Neutral Vision 2050 — The Challenge of Zero-Carbon Steel," as our own new initiative to contribute to global efforts to control and adapt to climate change, a critical issue affecting human beings, we will strive to achieve carbon neutrality by 2050 as our top priority management issue.

In order to make concerted efforts to tackle these extremely difficult issues, we have established a new "Key Phrase" to summarize our environmental management and an "Activity Logo" to represent our activities as our "Environmental Brand Mark.”

Key Phrase
Make Our Earth Green

Activity Logo

Our CO2 emissions reduction scenario

We have developed a CO2 emissions reduction scenario with a target in 2030 for 30% or more reduction in total CO2 emission vs. 2013, and an aim to become carbon neutral in 2050. We started group-wide efforts toward realizing them.

<table>
<thead>
<tr>
<th>2030 Target</th>
<th>30% or more reduction in total CO2 emissions vs. 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision 2050</td>
<td>Aim to become carbon neutral</td>
</tr>
</tbody>
</table>

30% reduction in total CO2 emissions vs. 2013 by actually implementing the COURSE50 in the existing BF and BOF processes, reducing CO2 emissions in existing processes, and establishing an efficient production framework.

As the major share of CO2 emissions in the steelmaking process is derived from the iron ore reduction process in the BF, the reducing agent needs to be reconsidered in order to drastically reduce CO2 emissions in steelmaking. Steelmaking can also be done by a process using the electric arc furnace (EAF) with steel scrap as raw material. As steel scrap is already reduced, this method enables less CO2 emission in steelmaking but has its own shortcomings: difficulty in making larger facilities, which make it less suitable for large-scale mass production; limited supply of scrap at present; and difficulty in making high-grade steel due to impurities contained in scrap.

Current steelmaking process: Characteristics and issues

In nature, iron exists as oxides, as iron ore. To produce steel products, oxygen must be removed (reduced) from iron ore. Starting from Tatara steelmaking in the ancient times of Japan, the process using the blast furnace (BF) and the basic oxygen furnace (BOF), which removes oxygen from iron oxide by carbon (charcoal, coal), has been used. Within a gigantic BF, a chemical reaction called reduction occurs, and steel is continually and efficiently produced from iron ore.

At present, the use of carbon (coal) is the best, stable, cost-effective method for reducing iron ore in large quantities. This reaction, however, emits CO2 as carbon removes the oxygen in the iron ore. Inevitable generation of CO2 caused by use of carbon as reducing agent

To this end, in addition to efforts to reduce CO2 emissions through energy conservation and energy efficiency improvements in the entire supply chain, we are committed to addressing climate change as the greatest priority management issue with the “Nippon Steel Carbon Neutral Vision 2050” as our own new measures.
Nippon Steel is taking challenges toward achieving zero-carbon steel

We are committed to reimagining our present, long-lasting steelmaking process and aiming to achieve carbon neutrality by overcoming issues involving decarbonization and realizing zero-carbon steel. Our idea of a “zero-carbon steel production process” is to combine two steelmaking routes, utilizing their respective features: the blast furnace (BF) and basic oxygen furnace (BOF) route together, and the electric arc furnace (EAF) route. Either route, however, has its own big challenges.

The EAF route uses already-reduced steel scrap, which does not generate CO₂, associated with reduction, thereby reducing CO₂ emissions. We seek to make a larger EAF, raise efficiency in production, and use carbon-free electric power, in order to further reduce CO₂ emissions. In the BF + BOF route, the existing BF is partially retrofit for the COURSE50 project and further advanced for the Super COURSE50 project. In these furnaces, the reducing agent is replaced, by some of the coking coal (coke) being substituted by hydrogen. This produces H₂O and hence generates CO₂ associated with reduction, thereby reducing CO₂ emissions.

Moreover, in either of the routes, direct-reduced iron (DRI) manufactured by the direct reduction process by 100% hydrogen, is partially used as raw material in both routes.

In summary, we will thus take up three challenges to develop breakthrough technologies: 1. High-grade steel production in large-sized EAFs; 2. COURSE50 BF and Super-COURSE50 BF projects; and 3. 100% hydrogen use in the direct reduction process. CO₂, which is still emitted after these processes, is to be offset by CCUS to ultimately achieve carbon neutrality.

To realize this plan, supply of carbon-free electric power and hydrogen are indispensable.

Zero carbon steel production process

![Diagram of steel production process]

Three breakthrough technologies

1. BF route: Improvement in productivity by increasing the size of EAFs technology development to remove impurities for the production of high-grade steel
2. BF + BOF route: Hydrogen injection into a BF (COURSE50 and Super COURSE50 projects) + practical implementation of CCUS
3. 100% hydrogen use in direct reduction process: use of hydrogen to produce DRI, which is partially used as raw material in both routes

Challenge 1: high-grade steel production in large-sized EAFs

The EAF steelmaking uses steel scrap, which enables reduction in CO₂ emissions during steel production. However, there are many challenges in the production of high-grade steel by EAFs and in large-scale mass production.

First of all, copper and other impurities in scrap and nitrogen contamination in molten metal affect the quality of steel, thereby limiting the product types and making it difficult to manufacture high-grade steel that satisfies user requirements for weight reduction and strength.

In addition, in the EAF route, the initial melting of scrap and other cold iron sources as well as refining with natural convection in an EAF take a long time, hence, the result is less productivity compared to the use of a BOF in which strong agitation occurs by an oxygen gas jet. This problem will be more pronounced in larger-scale EAFs.

That is why the current average annual production capacity of the EAF route is approximately 0.7 million tons per unit, far less than the BF + BOF route of approximately 4.0 million tons. Moreover, the melting of DRI is expected to decrease production efficiency due to the deterioration of heat transfer, melting time, and refining load, caused by a large amount of gangue and voids in DRI.

In summary, production of high-grade steel, which uses a certain amount of DRI in an EAF, especially large-scale EAFs, has many challenges in terms of quality and productivity. We will take up the challenge of establishing the technology to eliminate hazardous impurities and to improve productivity with a larger-scale, higher-efficiency EAF.

Concentration of impurities that cannot be removed (%)
Mechanism and challenges of hydrogen reduction in blast furnaces

Since hydrogen reduction is achieved by reducing iron ore by use of hydrogen rather than by conventional carbon (coal), the reduction process produces H₂O with no CO₂ emission. We are therefore taking up the challenge of reducing CO₂ emission by partially replacing carbon by hydrogen as the reducing agent and switching from iron ore to direct reduced iron (DRI). This will be enabled by retrofitting existing blast furnaces (BFs) into COURSE50 BFs in the zero-carbon steel production process.

The COURSE50 Project (Technological Development and Innovative Steelmaking Process)²

Since 2008, the COURSE50 has been developing technologies to lower CO₂ emissions by 30%: a 10% cut in CO₂ emissions from a blast furnace by adopting technologies to reduce iron ore by use of hydrogen and a 20% cut in CO₂ emissions by adopting technologies to capture — separate and recover — CO₂ contained in blast furnace gas. Concerning the former case, a 10% cut has been verified at a 120 m³ experimental blast furnace at the Kunitama Area of the East Nippon Works and we also undertook simulation for the size of an actual blast furnace, moving the project closer to adoption of this innovative reduction technologies in commercial-use blast furnaces.

1 Commissioned project by the New Energy and Industrial Technology Development Organization (NEDO)

² The hydrogen cost is assumed to be ¥20/Nm³ or less in 2050 under the current basic hydrogen strategy, compared to the equivalent estimated cost to the coke for steelmaking at approximately ¥8/Nm³.

The hydrogen cost is assumed to be ¥20/Nm³ or less in 2050 under the current basic hydrogen strategy, compared to the equivalent estimated cost to the coke for steelmaking at approximately ¥8/Nm³.

Efforts toward stable procurement of hydrogen

In order to prepare for the approaching hydrogen society, we are involved with a strong sense of anticipation and responsibility from various perspectives including the following. We may potentially become one of the largest hydrogen users in the future (assuming that the amount of hydrogen required for us to become zero-carbon would exceed 7 million tons/year). This means we need a more affordable hydrogen price to be realized than other industrial need.² At the same time, we will be a major supplier of steel needed for hydrogen infrastructure.

We therefore participate in various hydrogen-related councils promoted by the Ministry of Economy, Trade and Industry and the Energy Agency, as well as the cross-sectional network that includes hydrogen-related industries such as energy, automobiles, and chemicals, and various organizations. We are also mindful of working with the system design, not only for Nippon Steel but for the entire steel industry, when needed.

Concerning the overseas procurement of hydrogen, we are considering cooperation with overseas resource majors, who may potentially supply hydrogen to us. We are thus active on a wide and widening front.
Environmental Initiatives

**Development of CCUS technology**

CCUS (Carbon Capture, Utilization and Storage) is a technology that separates, captures, and stores CO₂ in the ground, or directly uses CO₂ or carbon recycled products. The Nippon Steel Group’s CCUS technology development efforts are focused on the following areas:

- **ESCAP™** (Energy Sparing CO₂ Absorption Process) is a facility that has been commercialized by Nippon Steel Engineering Co., Ltd., with its own technology, based on energy-saving CO₂ recovery technology developed by the COURSE50 project (for development of process technology for environmentally harmonized steelmaking and hydrogen reduction). Two units have already been commercialized in Japan. The Nippon Steel Group is now working to improve energy efficiency in order to further spread it and reduce costs.

- The absorption solution jointly developed by Nippon Steel and the Research Institute of Innovative Technology for the Earth (RITE) enables the separation and recovery of high-purity CO₂ with less energy from gas containing CO₂. It reduces heat consumption by more than 40% compared to general-purpose technology using the chemical absorption method, and can produce high-purity CO₂ from raw material gas with high impurities, which can be used for food and other applications. It can also be used for a wide range of industrial applications, including chemical raw materials, CO₂ removal applications in chemical processes, EOR (Improved petroleum recovery), and CCS (CO₂ underground storage).

- **CCU (Carbon Capture and Utilization)** technology (high-performance chemical adsorption liquid and development of CO₂-based manufacturing technologies for chemicals and fuels). The necessary external conditions include the securing of the storage space needed for building the storage infrastructure for CCS, legislation, and tax incentives, as well as ensuring the business profitability of chemicals and fuels manufactured by CCU (Carbon Capture and Utilization), and preferential treatment of carbon recycled products.

**COLUMN**

**Efforts to promote the spread and increase efficiency of ESCAP™ CO₂ separation and recovery equipment**

ESCAP™ is a CO₂ absorption process (Energy Sparing CO₂ Absorption Process) that reduces CO₂ emissions in the steel industry. It is a public-offering project business of the New Energy and Industrial Technology Development Organization (NEDO).

**Enzymes to synthesize carbonate esters (shown as DMC, or dimethyl carbonate in the figure below) from CO₂ and alcohol. Carbonate esters are the material to be used in the synthesis of polycarbonate and other materials.**

**Efforts to develop CO₂ transport technology**

Jointly with Japan CCS Co., Engineering Advancement Association of Japan, and ITOMAS Corporation, we have commenced the “CCUS R&D and Demonstration Related Projects: large-scale CCUS demonstration in Tomakomai and demonstration of CO₂ ship transportation” which is a public-offering project business of the New Energy and Industrial Technology Development Organization (NEDO).

In this project, we will conduct R&D of long-distance, mass-volume transport technologies of CO₂, in a scale of one-million tons per year, that lead to lower-cost transportation, and also conduct R&D, demonstration tests, and surveys to establish ship transport technology for liquefied CO₂ through demonstration tests and related surveys. The project aims at the social implementation of CCUS around 2020.

**Toward achieving the Carbon Neutral Vision 2050**

**Roadmap**

- **2020**
  - Reduction of CO₂ emissions from existing processes
  - Building of an efficient production system (centralized production at an integrated steel mill, etc. (some transfers from BFs to EAFs, etc.)

- **2025**
  - Reduction of CO₂ emissions in existing processes (advances in existing technology, expansion of use of scraps and waste plastics, etc.)
  - Building of efficient steelmaking processes (BF and BOF route)
  - Reduction of CO₂ emissions from existing processes (lower-carbon power generation technologies, use of low carbon fuel in coal-based generation, etc.)
  - Building of efficient steelmaking processes (BF and BOF route)

- **2030**
  - Reduction of CO₂ emissions from existing processes (lower-carbon power generation technologies, use of low carbon fuel in coal-based generation, etc.)
  - Building of efficient steelmaking processes (BF and BOF route)
  - Reduction of CO₂ emissions from existing processes (lower-carbon power generation technologies, use of low carbon fuel in coal-based generation, etc.)
  - Building of efficient steelmaking processes (BF and BOF route)

- **2050**
  - Reduction of CO₂ emissions from existing processes (lower-carbon power generation technologies, use of low carbon fuel in coal-based generation, etc.)
  - Building of efficient steelmaking processes (BF and BOF route)
  - Reduction of CO₂ emissions from existing processes (lower-carbon power generation technologies, use of low carbon fuel in coal-based generation, etc.)
  - Building of efficient steelmaking processes (BF and BOF route)

**Structure toward achieving zero-carbon steel**

To examine and implement various measures to develop and commercialize breakthrough technologies in steelmaking process, which is the key to achieving zero carbon steel (a top management priority), we established the Zero-Carbon Steel Committee, in which all five Representative Directors and Executive Vice Presidents, participate. Further, in April 2021, a project team of about 60 to 70 officers and employees of various divisions was formed by the Committee to consider carbon neutral technologies.
Collaboration with others in society to realize zero carbon steel

In order to realize the zero-carbon steel objective, which is believed to be essential for Japan’s steel industry to continue to lead the world and to maintain and strengthen the competitiveness of Japan’s overall industry, Nippon Steel has been taking on the challenge to develop and implement breakthrough technologies ahead of the other countries. This is our most important management challenge.

In our estimates, the needed innovations will roughly require a half trillion yen in R&D expenses and 4-5 trillion yen in capital expenditures. In such a case the production cost of steel may more than double the current cost even if external conditions including the estimated prices of electric power and hydrogen, are best met in around 2050.

Besides the challenges taken by the steel industry, collaboration with others in society is essential in various aspects to realize zero-carbon steel:

1) long-term and multi-year government support for R&D in the field of breakthrough innovation etc.;
2) establishment of an insurmountable, stable, large-scale hydrogen supply infrastructure;
3) action on behalf of realization of carbon free power at an international competitive cost;
4) promotion of national projects for the development and commercialization of economical- ly-rational CO2Cs;
5) securing of equal footing in international competitions;
6) building of a system for society as a whole to bear enormous cost.

Facing these issues, we have been carefully explaining our ideas to relevant ministries and experts. Through Nippon Keidanren (Japan Business Federation) and the Japan Iron and Steel Federation, in which we take a leading position, we are making various recommendations regarding Japan’s climate change measures and energy policies in accordance with the Paris Agreement, at councils and committees of various ministries in Japan.

Investments needed for the zero-carbon steel project

CAPEX for practical implementation V4–5 trillion

<table>
<thead>
<tr>
<th>CAPEX for practical implementation V4–5 trillion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments needed for the zero-carbon steel project</td>
</tr>
</tbody>
</table>

Three factors to increase costs for realizing zero-carbon steel

1. Huge R&D expenses
2. Huge CAPEX for practical implementation
3. Increase in operational cost, even if inexpensive carbon free hydrogen and zero-emission power are to be secured

The production cost of crude steel may more than double the current cost.

Three collaborations required for realizing zero-carbon steel

1. A national strategy to realize a “virtuous cycle of environment sustainability and economic growth”
   - Long-term and continuous government support for R&D in the field of breakthrough innovation etc.
   - Establishment of inexpensive and stable large-scale hydrogen supply infrastructure
   - Realization of carbon free power at an international competitive cost
   - Promotion of national projects for the development and commercialization of CO2Cs
2. Realization of government’s comprehensive policies to secure equal footing in international competition, strengthen industrial competitiveness, and lead to business chances
3. Formation of consensus on the issue of cost bearing by society
   - Establishing a system for society as a whole to bear the enormous costs of realizing zero-carbon steel, such as R&D expenses, CAPEX for replacing existing facilities, and significant increases in production costs.

Contributing to the realization of a carbon neutral society through eco-products

In addition to promoting drastic technological innovation in the steel manufacturing process, we are contributing to the realization of a carbon neutral society by providing high-function steel products (Eco-Products) that help customers save energy and reduce CO2 emissions when using final products. Specifically, we will provide high-performance electrical steel sheets for drive motors as well as ultra-high tensile steel plates for lighter body weight of electric vehicles, to achieve significant CO2 reduction effects when our products are used as manufactured products.

Three collaborations required for realizing zero-carbon steel

1. Long-term and multi-year government support for R&D in the field of breakthrough innovation etc.
2. Establishment of an insurmountable, stable, large-scale hydrogen supply infrastructure
3. Action on behalf of realization of carbon free power at an international competitive cost

Energy efficiency in steelmaking by country (2015)

<table>
<thead>
<tr>
<th>Country</th>
<th>Energy efficiency in steelmaking (% of Japan energy efficiency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>100</td>
</tr>
<tr>
<td>USA</td>
<td>116</td>
</tr>
<tr>
<td>Brazil</td>
<td>122</td>
</tr>
<tr>
<td>India</td>
<td>123</td>
</tr>
<tr>
<td>Russia</td>
<td>128</td>
</tr>
<tr>
<td>China</td>
<td>113</td>
</tr>
<tr>
<td>South Korea</td>
<td>110</td>
</tr>
<tr>
<td>Germany</td>
<td>103</td>
</tr>
<tr>
<td>France</td>
<td>100</td>
</tr>
<tr>
<td>UK</td>
<td>100</td>
</tr>
</tbody>
</table>

Use of by-products and waste in CO2 reduction

1. Waste plastics
   - Using coke ovens at seven areas of Nippon Steel’s five steelworks, about 200,000 tons of used plastic containers and packaging collected from general households nationwide are recycled 100%, in compliance with the Act for Promotion of Use of Recycled Resources. This contributes to reduction of about 600,000 tons of CO2 per year. In the future, we will consider further expanding the use of waste plastics.

2. Blast furnace cement
   - Use of blast furnace slag in production of cement enables us to reduce use of limestone and fuel, contributing to reduction of 320 kg in CO2 emissions per one ton of cement (40% reduction compared to ordinary cement production).

3. Blue carbon
   - Nippon Steel has promoted scientific analysis on usefulness and safety of use of steel slag — a by-product from the steelmaking process. To improve this technology, we began a basic study on blue carbon (CO2 fixation in the marine ecosystem), which is getting more attention as a measure against climate change. We started to collect basic data on how much CO2 can be fixated. This technology, we began a basic study on blue carbon (CO2 fixation in the marine ecosystem), which is getting more attention as a measure against climate change. We started to collect basic data on how much CO2 can be fixated.

Source: International Comparisons of Energy Efficiency (Sectors of Electricity Generation, Iron and steel, Cement), RITE, 2015. The current table is not revised to reflect new energy data provided by the Japan Iron and Steel Federation’s "Environmental Initiatives"
Nippon Steel's current energy-conservation initiatives (Eco Process)

Nippon Steel has been working on energy conservation from diverse starting points: improving efficient use of energy generated in the steelmaking process; i.e., power generated by product gas and waste heat; making operational improvements in each process; renovation of older coke ovens and other equipment; introduction of high-efficiency power generation facilities and oxygen plants; and conversion to regenerative burners in the reheating furnaces.

Thanks to the achievement from these continual efforts, as well as a decline in product output mainly due to the impact of the COVID-19 pandemic, the Nippon Steel Group consumed 96% (FY) of energy in fiscal 2020, posting a significant reduction from fiscal 2019. The Group’s energy- derived emissions also dropped significantly to 76 million tons preliminarily.

Despite steady positive impacts generated from efforts for energy conservation, the CO2 emissions intensity has deteriorated mainly due to a decline in production efficiency caused by a decline in production in fiscal 2020 and the impact of heavy rain and operational troubles in fiscal 2019 and 2018, in addition to the impact of introducing energy-consuming large dust collectors and other equipment.

Meanwhile, the Japan Iron and Steel Federation (JSF), where we are actively involved as a core member, is promoting “three ecos” and further

Japan Iron and Steel Federation’s Action Plans for a Low-Carbon Society

(“Three ecos and innovative technology development”)

<table>
<thead>
<tr>
<th>Year</th>
<th>FY2020</th>
<th>FY2019</th>
<th>FY2018</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 emission reduction plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assisted in energy-saving activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in support of energy-saving activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nippon Steel has strengthened its support for customer energy-saving activities, continuing to assist companies in improving energy efficiency and to make them more energy-efficient.

The target reductions in CO2 emission volume are set for fiscal 2005 as the base year and based on a certain percentage of the CO2 emissions in the year of the first initiative.

Meanwhile, the Japan Iron and Steel Federation (JISF), where we are actively involved as a core member, is promoting “three ecos” and further

Japan Iron and Steel Federation’s Action Plans for a Low-Carbon Society

(“Three ecos and innovative technology development”)

<table>
<thead>
<tr>
<th>Year</th>
<th>FY2020</th>
<th>FY2019</th>
<th>FY2018</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 emission reduction plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assisted in energy-saving activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in support of energy-saving activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As a result of the JISF’s initiatives, Nippon Steel is improving its energy efficiency and reducing its CO2 emissions. Nippon Steel is in the process of implementing a number of energy-saving activities as part of its efforts to reduce CO2 emissions.

Nippon Steel’s environmental initiatives (Eco Process)

Nippon Steel Group's current energy consumption

<table>
<thead>
<tr>
<th>Year</th>
<th>FY2020</th>
<th>FY2019</th>
<th>FY2018</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 emission reduction plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assisted in energy-saving activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in support of energy-saving activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nippon Steel Group's energy-derived CO2 emissions

<table>
<thead>
<tr>
<th>Year</th>
<th>FY2020</th>
<th>FY2019</th>
<th>FY2018</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 emission reduction plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assisted in energy-saving activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in support of energy-saving activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As a result of the JISF’s initiatives, Nippon Steel is improving its energy efficiency and reducing its CO2 emissions. Nippon Steel is in the process of implementing a number of energy-saving activities as part of its efforts to reduce CO2 emissions.

Nippon Steel’s environmental initiatives (Eco Process)

Nippon Steel Group's current energy consumption

<table>
<thead>
<tr>
<th>Year</th>
<th>FY2020</th>
<th>FY2019</th>
<th>FY2018</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 emission reduction plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assisted in energy-saving activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in support of energy-saving activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nippon Steel Group's energy-derived CO2 emissions

<table>
<thead>
<tr>
<th>Year</th>
<th>FY2020</th>
<th>FY2019</th>
<th>FY2018</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 emission reduction plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assisted in energy-saving activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in support of energy-saving activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As a result of the JISF’s initiatives, Nippon Steel is improving its energy efficiency and reducing its CO2 emissions. Nippon Steel is in the process of implementing a number of energy-saving activities as part of its efforts to reduce CO2 emissions.

CO2 emissions in the value chain

CO2 emissions originated from energy source and generated in Nippon Steel’s manufacturing process (Scope 1 and Scope 2) as well as CO2 emissions in the value chain (Scope 3), which are calculated by using the Green Value Chain Platform of the Ministry of the Environment and other methods are as follows.

<table>
<thead>
<tr>
<th>Year</th>
<th>FY2020</th>
<th>FY2019</th>
<th>FY2018</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 emission reduction plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assisted in energy-saving activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in steel product</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission reduction in support of energy-saving activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As a result of the JISF’s initiatives, Nippon Steel is improving its energy efficiency and reducing its CO2 emissions. Nippon Steel is in the process of implementing a number of energy-saving activities as part of its efforts to reduce CO2 emissions.
Information disclosure according to recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)

Given the international community's commitment to achieving long-term goals of the Paris Agreement, Nippon Steel signed the statement of support for the Task Force on Climate-related Financial Disclosures (TCFD) in May 2019, considering the climate change as one of priorities that the planet is facing today. Based on the recommendations, we are committed to information disclosure on the climate change impact to our business activities.

[For reference] TCFD’s recommendations and supporting recommended disclosures

TCFD's recommendations and supporting recommended disclosures

Reference page

1. [Governance] Disclose the organization’s governance related to climate-risk factors and opportunities.

a. Describe the board’s oversight of climate-related risks and opportunities. p. 25, 41

b. Describe management’s role in assessing and managing climate-related risks and opportunities. p. 47

2. [Strategy] Disclose the actual and potential impacts of climate-related risks and opportunities on the organization’s businesses, strategies, 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. p. 28

b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategies, and financial planning. p. 28

c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

3. [Risk Management] Disclose how the organization identifies, assesses, and manages climate-related risks.

a. Describe the organization’s processes for identifying and assessing climate-related risks. p. 41

b. Describe the organization’s processes for managing climate-related risks. p. 41

c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management. p. 41

4. [Metrics and Targets] Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process. p. 11

b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks. p. 25, 26

c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance targets against targets. p. 12

Scenario analysis

- Medium to long-term growth in global steel demand is projected, largely influenced by population growth and economic growth in emerging countries, according to the Long-Term Vision for Climate Change Mitigation published by the Japan Iron and Steel Federation in 2018. Since scrap alone cannot meet all steel demand, pig iron production in the blast furnace route is expected to increase from 1.72 billion tons in 2015 to 1.40 billion tons in 2050.

- As companies are increasingly responding to climate changes and to disclose related information, investors and other stakeholders are increasingly interested in the steel industry’s response to risks, such as (1) potential significant reduction in CO2 emissions; (2) changing trends of steel users, including the automobile sector (i.e., increase in electric vehicles, shift to lightweight materials); and (3) adoption of carbon pricing that leads to an increase in operating cost.

- Upon identifying our potential risks and opportunities driven by climate change and considering our strategic plans for the future, we made scenario analysis for a long-term span to 2050, while referring to the two scenarios (the below 2°C warming scenario and the 4°C warming scenario) of the International Energy Agency (IEA) so as to utilize them for devising our future business strategies.

- In addition, we have formulated a new climate change countermeasures vision with the aim of achieving “carbon neutral in 2050” consistent with the 1.5°C warming scenario, and have decided to tackle development of breakthrough technologies aimed at zero-carbon steel as a top management challenge.

- The below 2°C warming scenario is a case where a number of measures are taken to implement to keep global average temperature rise below 2°C, and the 4°C warming scenario is a case where no measures are taken, implying that the global average temperature will rise by 4 degrees by 2100 without taking any economic or additional measures against climate change.

- Considering the climate change as one of priorities that the planet is facing today, we have established a new climate change countermeasures vision with the aim of achieving “carbon neutral in 2050” consistent with the 1.5°C warming scenario, and have decided to tackle development of breakthrough technologies aimed at zero-carbon steel as a top management challenge.

Below 2°C Scenario analysis

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Factor</th>
<th>Events</th>
<th>Impact on Nippon Steel</th>
<th>Nippon Steel’s strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transition factor 1</td>
<td>Advance in electric vehicles (EVs), decline in powertrain-related steel demand</td>
<td>Estimates for 2050P</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Potential decline in the ratio of powertrain-related demand, driven by electrification, but potential increase in demand for the global expansion of number of vehicle types and thereby an increase in demand for high-performance steel for EVs.
- Increase in demand for high-performance steel for EVs. |
- Capturing growing demand by providing high-performance steel, electric steel sheet, using EV-related supply networks, and utilizing solutions (ReiMat™, AutoConcept). |
| Transition factor 2 | Shift to other lightweight materials, promoted by tightening fuel efficiency regulations, etc. (lightweight materials) | Shift to other lightweight materials, promoted by tightening fuel efficiency regulations, etc. |
- Switch to other lightweight materials is possible but should not be significant on an impact basis if the TCFD statement is used. |
- Implementation of TCFD statement is to set up a framework for the TCFD’s recommendations and supposed recommendations. |
| Transition factor 3 | Increasing social demand for CO2 reduction (shift to low-carbon steel) | Promotion of shift to low-carbon steel |
- Increase in the revenue of use of carbon, CO2 reduction amount, and potential increase in demand for low-carbon steel production to continue up to 2050 if reliable low-carbon steel demand is not satisfied by shift scales of scale. |
- Increase in demand for low-carbon steel. |
- Promotion of the use of reduced-duty and other measures in order to reduce CO2 in existing processes. |
- Realization of zero-carbon steel by promoting the carbon neutral steel smelting (breakthrough development technology, including high-grade steel production in large-scale EAF and hydrogen reduction technology) and carbon saving technology. |
- Consideration of the cost burden on society as a whole. |
| Transition factor 4 | Increase in operating cost caused by adoption of carbon pricing | Adoption of carbon pricing |
- Significant impact of carbon pricing, which is an additional burden and other measures for CAR. |
- Follow-up on the impact on carbon pricing discussions, including developments in the EU carbon adjustment regulation. |
- Hydrogen reduction technology and use of direct reduced iron to reduce CO2 emission. |
- Negotiation on transfer with customers. |
| Transition factor 5 | High-level needs for energy-efficient products and solutions associated with a hydrogen-oriented society | Increase in demand for hydrogen-related infrastructure and facilities | Eco-friendly technology solution to boost demand |
- Profit growth for the Group's products and solutions that support a hydrogen-oriented society (Hydrogen steel, Nippon Steel Hydrogen Engineering). |
- Profit growth, driven by our Group’s long-term proven energy-saving technology solutions. |
- Expansion of “Eco Products for the World,” Government-private cooperation, Technologies custom-built list, and stakeholder diagnosis to provide energy-saving technologies in emerging countries (contribution to the global value chain). |
| Transition factor 6 | Higher needs for energy-efficient products and technology in the world | Increase in demand for products of the Group | Profit growth, driven by our Group’s long-term proven energy-saving technology solutions. |
- Profit growth, driven by our Group’s long-term proven energy-saving technology solutions. |
- Expansion of “Eco Products for the World,” Government-private cooperation, Technologies custom-built list, and stakeholder diagnosis to provide energy-saving technologies in emerging countries (contribution to the global value chain). |
| Transition factor 7 | High-level needs for energy-efficient products and solutions associated with a hydrogen-oriented society | Increase in demand for products of the Group | Profit growth, driven by our Group’s long-term proven energy-saving technology solutions. |
- Profit growth, driven by our Group’s long-term proven energy-saving technology solutions. |
- Expansion of “Eco Products for the World,” Government-private cooperation, Technologies custom-built list, and stakeholder diagnosis to provide energy-saving technologies in emerging countries (contribution to the global value chain). |
| Physical factor 1 | Suspension of operation by raw material suppliers, due to abnormal weather | Difficulty to procure raw materials, caused by abnormal weather |
- Limited demand risk in securing stable procurement of rare materials by taking the following measures:
  - Material sourcing from multiple regions in the world
  - Expanding raw material inventories in steelworks and stocks. |
- Limited impact by taking measures for risks |
- Profit growth, driven by our Group’s long-term proven energy-saving technology solutions. |
- Expansion of “Eco Products for the World,” Government-private cooperation, Technologies custom-built list, and stakeholder diagnosis to provide energy-saving technologies in emerging countries (contribution to the global value chain). |
- Continuous implementation of adaptation measures, with consideration of long-term historic measures against high-impact and high-recovery disaster prevention strategies. |
| Physical factor 2 | Suspension of operation and shipper, due to abnormal weather | Difficulty in operations, caused by abnormal weather |
- Limited demand risk in securing stable procurement of rare materials by taking the following measures:
  - Material sourcing from multiple regions in the world
  - Expanding raw material inventories in steelworks and stocks. |
- Limited impact by taking appropriate measures |
- Continuous implementation of adaptation measures, with consideration of long-term historic measures against high-impact and high-recovery disaster prevention strategies. |
- Limited demand risk in securing stable procurement of rare materials by taking the following measures:
  - Material sourcing from multiple regions in the world
  - Expanding raw material inventories in steelworks and stocks. |
- Continuous implementation of adaptation measures, with consideration of long-term historic measures against high-impact and high-recovery disaster prevention strategies. |
- Limited demand risk in securing stable procurement of rare materials by taking the following measures:
  - Material sourcing from multiple regions in the world
  - Expanding raw material inventories in steelworks and stocks. |
- Limited impact by taking appropriate measures |
- Continuous implementation of adaptation measures, with consideration of long-term historic measures against high-impact and high-recovery disaster prevention strategies. |
- Limited demand risk in securing stable procurement of rare materials by taking the following measures:
  - Material sourcing from multiple regions in the world
  - Expanding raw material inventories in steelworks and stocks. |
**Environmental Initiatives**

**Transition factor 1**
Response to advance in electric vehicles (EVs)

According to the International Energy Agency (IEA), the ratio of vehicles with an internal combustion engine (ICE) is expected to decline but the global cumulative number of vehicles is projected to increase, which results in an increase in demand for steel materials for automobiles.

In addition, advance in electric vehicles (EVs) is expected to both increase demand for non-oriented electrical steel sheets for motors of eco cars and promote development of higher-grade sheets. Due to such demand growth potential, we have decided to invest over ¥150 billion for electrical steel sheets in the Kyushu Works-Yawata Area (approx. ¥56 billion investment) and the Setouchi Works-Héron (approx. ¥49 billion).

Facing the request from customers for even higher efficiency in motors, so as to lengthen vehicle operation distance, we will continue efforts to develop electrical steel sheets with further reduction in iron loss.

**Transition factor 2**
Response to shift to other lightweight materials

Aluminum and carbon fiber reinforced plastic are lighter in weight than steel and may appear to be a preferable material at the time of product use. However, these materials cause more CO2 emission in the manufacturing process than the equivalent for steel and are difficult to be recycled, and the quality of the products tend to deteriorate. From the Life Cycle Assessment (LCA) viewpoint, which considers the impact of a material from production to recycling, steel has lower environmental impact. We make efforts in broadly encouraging judgments using LCA. We are also taking up the challenge of making lighter-weight steel products. As an example, for vehicles, in addition to development of advanced high-strength steel sheets, we have created the “Steel™ -AutoConcept,” which combines solution technologies (a component structure and processing technologies to materialize it) that maximize performance of materials. This enables a 30% reduction in vehicle body weight compared to conventional vehicles.

If each element technology of the NSSteel™-AutoConcept comes to be widely used, extreme lightweight all-steel vehicle bodies can be made at low cost. Development of higher-strength components is also expected to be another way to secure further reduction in weight.

**Transition factor 3**
Heighened need for solutions for “National Resilience” against natural disasters

In recent years, severe natural disasters have occurred more frequently in Japan and earthquakes, heavy rains and snow, volcanic eruption, and other disasters have caused extensive damage to people’s lives. The Japanese government therefore developed the Fundamental Plan for National Resilience, based on the National Resilience Basic Law, and has been implementing various measures.

Against this background, the Nippon Steel Group has expanded its technology and product portfolio, which contributes to national resilience, and has made proposals to potential clients (i.e., the national and local governments), design consulting firms, etc. We have steadily made achievements particularly in areas such as adoption of our technology and products in measures against tsunami and earthquake-caused liquefaction, as well as repair and reinforcement of agricultural civil engineering facilities (i.e., water-use facilities and reservoirs).

**Physical factor 3**
Heighened need for solutions for “National Resilience” against natural disasters

In recent years, severe natural disasters have occurred more frequently in Japan and earthquakes, heavy rains and snow, volcanic eruption, and other disasters have caused extensive damage to people’s lives. The Japanese government therefore developed the Fundamental Plan for National Resilience, based on the National Resilience Basic Law, and has been implementing various measures.

Against this background, the Nippon Steel Group has expanded its technology and product portfolio, which contributes to national resilience, and has made proposals to potential clients (i.e., the national and local governments), design consulting firms, etc. We have steadily made achievements particularly in areas such as adoption of our technology and products in measures against tsunami and earthquake-caused liquefaction, as well as repair and reinforcement of agricultural civil engineering facilities (i.e., water-use facilities and reservoirs).

**Environmental Initiatives**

**Response to shift to other lightweight materials**

Aluminum and carbon fiber reinforced plastic are lighter in weight than steel and may appear to be a preferable material at the time of product use. However, these materials cause more CO2 emission in the manufacturing process than the equivalent for steel and are difficult to be recycled, and the quality of the products tend to deteriorate. From the Life Cycle Assessment (LCA) viewpoint, which considers the impact of a material from production to recycling, steel has lower environmental impact. We make efforts in broadly encouraging judgments using LCA. We are also taking up the challenge of making lighter-weight steel products. As an example, for vehicles, in addition to development of advanced high-strength steel sheets, we have created the “Steel™ -AutoConcept,” which combines solution technologies (a component structure and processing technologies to materialize it) that maximize performance of materials. This enables a 30% reduction in vehicle body weight compared to conventional vehicles.

If each element technology of the NSSteel™-AutoConcept comes to be widely used, extreme lightweight all-steel vehicle bodies can be made at low cost. Development of higher-strength components is also expected to be another way to secure further reduction in weight.

**Environmental Initiatives**

**Response to shift to other lightweight materials**

Aluminum and carbon fiber reinforced plastic are lighter in weight than steel and may appear to be a preferable material at the time of product use. However, these materials cause more CO2 emission in the manufacturing process than the equivalent for steel and are difficult to be recycled, and the quality of the products tend to deteriorate. From the Life Cycle Assessment (LCA) viewpoint, which considers the impact of a material from production to recycling, steel has lower environmental impact. We make efforts in broadly encouraging judgments using LCA. We are also taking up the challenge of making lighter-weight steel products. As an example, for vehicles, in addition to development of advanced high-strength steel sheets, we have created the “Steel™ -AutoConcept,” which combines solution technologies (a component structure and processing technologies to materialize it) that maximize performance of materials. This enables a 30% reduction in vehicle body weight compared to conventional vehicles.

If each element technology of the NSSteel™-AutoConcept comes to be widely used, extreme lightweight all-steel vehicle bodies can be made at low cost. Development of higher-strength components is also expected to be another way to secure further reduction in weight.

**Physical factor 3**
Heighened need for solutions for “National Resilience” against natural disasters

In recent years, severe natural disasters have occurred more frequently in Japan and earthquakes, heavy rains and snow, volcanic eruption, and other disasters have caused extensive damage to people’s lives. The Japanese government therefore developed the Fundamental Plan for National Resilience, based on the National Resilience Basic Law, and has been implementing various measures.

Against this background, the Nippon Steel Group has expanded its technology and product portfolio, which contributes to national resilience, and has made proposals to potential clients (i.e., the national and local governments), design consulting firms, etc. We have steadily made achievements particularly in areas such as adoption of our technology and products in measures against tsunami and earthquake-caused liquefaction, as well as repair and reinforcement of agricultural civil engineering facilities (i.e., water-use facilities and reservoirs).
ECO PRODUCTS (What we produce is “eco-friendly”)

Our Group’s products have advanced functions and reliability, which are based on our superior technological capabilities, and are used in diverse areas including energy, transportation and construction equipment, and household products. They typically help our customers become more efficient while making their products lighter or lengthening product life. That translates into the saving of resources and energy, and into a reduction in CO2 emissions at the point of use at our customers, thereby contributing to lessening the environmental impact.

NSafe™-AutoConcept

This is a next-generation steel car concept to realize significant weight reduction and improved safety. We have expanded our technical menu of materials development, structural and functional design, construction method development, and performance evaluation, and also have been proposing technologies to adapt to the next-generation mobility, such as electric powered vehicles including EVs.

High-efficiency electrical steel sheets

Electrical steel sheets are used as the iron-core of motors for transformers, automobiles, home appliances, industrial machinery, and so on. By maximising the magnetic properties of electrical steel sheets, the loss of electrical energy (iron loss) is reduced, contributing to energy conservation and CO2 emission reduction.

NSafe™-Hull, highly-ductile steel plates for shipbuilding

Having 50% higher ductility than conventional steel, NSafe™-Hull is the world’s first steel that prevents oil leakage at the time of a ship’s collision, thereby contributing to preservation of the marine environment. It has been adopted for large-sized bulk carriers and ULCCs (Ultra Large Crude Oil Carriers).

Mega NS Hyper Beam™

A new product, Mega NS Hyper Beam™, has about 20% greater web thickness than conventional fixed outside-width H-shaped steel of a large-sized cross section. Together with Nippon Steel's nine conventional H-shaped steel products, the Mega NS Hyper Beam™ has acquired the EcoLeaf Environmental Label, an international certification program that discloses the quantitative-environmental information related to LCA of products.

ECO SOLUTION (Sharing our “eco-solutions”)

With the understanding that the transfer of Japan’s advanced energy-saving technologies overseas can be one of the most effective ways to globally reduce CO2 emissions, Nippon Steel is participating in many energy-saving and environmental initiatives in Japan and overseas. For example, we work with the World Steel Association and directly with countries such as China and India.

Japan’s steel industry’s international cooperation in energy conservation

As a core member of the Japan Iron and Steel Federation (JISF), Nippon Steel is involved in multinational projects such as those for the Environment Committee of the World Steel Association. In addition, the JISF is promoting joint meetings of public and private steel-related parties, preparation of customized list of technologies, and assessment of steelworks as to energy-saving status. These are the three pillars of collaboration for bilateral energy-saving and environmental cooperation with India, Southeast Asia, and other countries and regions.

1 Joint meetings of public and private steel-related parties

In public-private steel-related joint meetings, we share the Technologies Customized List, the results of assessment of steel Mills, and introduce detailed technical information and financing schemes, in order to realise the early transfer of energy-saving technologies to emerging countries. By fiscal 2020, 19 joint meetings have been held: 3 times in India and 15 times in six ASEAN countries. In 2020, we held the online “AJSI Workshop 2020” conference with ASEAN countries and shared examples of energy saving and environmental conservation measures.

2 The technologies customized list

We identify the appropriate technologies for each country and region, and in addition to detailed technical information, we conduct the assessment of steel mills, and provide the Technologies Customized List, which comprises information such as on suppliers, for reference. In fiscal 2018 the technologies customized list was updated into the fourth version for India and into the third version for the ASEAN countries.

3 Assessment of steelworks

Experts from the Japanese steel industry visit the steel mills overseas to propose energy-saving technologies, provide operational improvement advice based on the operational conditions of the facilities, and conduct the energy-saving assessment of steel mills using the international ISO-6440. Up to fiscal 2020, we had carried out the assessment of 12 steel mills in India and 14 mills in six ASEAN countries.

Contribute to reduction of CO2 emission on a worldwide scale

Japan’s steel industry can contribute to reduction of CO2 emission on a worldwide scale by transferring its advanced energy-saving technologies to emerging countries. The reduction effects of CO2 emission by transfer of Japanese steelmakers’ energy-saving technologies have amounted to 68.57 million tons in reduction in CO2 emissions per year in total.

Japanese steel industry’s energy-saving technologies are spreading globally (units installed in numbers)

<table>
<thead>
<tr>
<th>Country</th>
<th>CDQ</th>
<th>CDQ units</th>
<th>CDQ CO2 emission reduction</th>
<th>GTCC</th>
<th>GTCC units</th>
<th>GTCC CO2 emission reduction</th>
<th>TRT</th>
<th>TRT units</th>
<th>TRT CO2 emission reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>81</td>
<td>4,150</td>
<td>2.8103</td>
<td>2</td>
<td>1,150</td>
<td>0.0998</td>
<td>2</td>
<td>80</td>
<td>0.0007</td>
</tr>
<tr>
<td>South Korea</td>
<td>9</td>
<td>620</td>
<td>0.3923</td>
<td>2</td>
<td>420</td>
<td>0.0270</td>
<td>2</td>
<td>80</td>
<td>0.0007</td>
</tr>
<tr>
<td>China</td>
<td>9</td>
<td>690</td>
<td>0.4631</td>
<td>2</td>
<td>400</td>
<td>0.0270</td>
<td>2</td>
<td>80</td>
<td>0.0007</td>
</tr>
<tr>
<td>India</td>
<td>81</td>
<td>4,150</td>
<td>2.8103</td>
<td>2</td>
<td>1,150</td>
<td>0.0998</td>
<td>2</td>
<td>80</td>
<td>0.0007</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1</td>
<td>50</td>
<td>0.0304</td>
<td>2</td>
<td>100</td>
<td>0.0140</td>
<td>2</td>
<td>20</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

1 | 2 | 3 | 4 | 5 | 6 | 7

- CDQ: Oxygen Converter Gas waste heat collection
- GTCC: High-efficiency GTCC power generation
- TRT: Top Pressure Recovery Turbine

<table>
<thead>
<tr>
<th>Country</th>
<th>CDQ</th>
<th>CDQ units</th>
<th>CDQ CO2 emission reduction</th>
<th>GTCC</th>
<th>GTCC units</th>
<th>GTCC CO2 emission reduction</th>
<th>TRT</th>
<th>TRT units</th>
<th>TRT CO2 emission reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>81</td>
<td>4,150</td>
<td>2.8103</td>
<td>2</td>
<td>1,150</td>
<td>0.0998</td>
<td>2</td>
<td>80</td>
<td>0.0007</td>
</tr>
<tr>
<td>South Korea</td>
<td>9</td>
<td>620</td>
<td>0.3923</td>
<td>2</td>
<td>420</td>
<td>0.0270</td>
<td>2</td>
<td>80</td>
<td>0.0007</td>
</tr>
<tr>
<td>China</td>
<td>9</td>
<td>690</td>
<td>0.4631</td>
<td>2</td>
<td>400</td>
<td>0.0270</td>
<td>2</td>
<td>80</td>
<td>0.0007</td>
</tr>
<tr>
<td>India</td>
<td>81</td>
<td>4,150</td>
<td>2.8103</td>
<td>2</td>
<td>1,150</td>
<td>0.0998</td>
<td>2</td>
<td>80</td>
<td>0.0007</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1</td>
<td>50</td>
<td>0.0304</td>
<td>2</td>
<td>100</td>
<td>0.0140</td>
<td>2</td>
<td>20</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

1 | 2 | 3 | 4 | 5 | 6 | 7

- CDQ: Oxygen Converter Gas waste heat collection
- GTCC: High-efficiency GTCC power generation
- TRT: Top Pressure Recovery Turbine

Japan’s steel industry can contribute to reduction of CO2 emission on a worldwide scale by transferring its advanced energy-saving technologies to emerging countries. The reduction effects of CO2 emission by transfer of Japanese steelmakers’ energy-saving technologies have amounted to 68.57 million tons in reduction in CO2 emissions per year in total.
Steel is a flexible, repeatedly-recyclable material

Steel, a material, used in great quantities in many kinds of products around us, is actually an eco-friendly material not only in its production but also in its disposal. In 2020, Nippon Steel produced 33.34 million tons of crude steel and generated 20.38 million tons of by-products. As a result of efforts to reduce most of by-products, such as by recycling, the final disposal amount was decreased to 229,000 tons, falling below the national target of 276,000 tons. The recycling rate has been maintained at 99% during manufacturing, since the cement-making process can be omitted.

Nippon Steel receives and processes waste plastics, such as by recycling, to create a closed system. Using waste plastics, Nippon Steel produces a variety of products. Recycling of waste plastics enables the company to create additional value from waste plastics.

Steel is also widely used for construction as well as for making agricultural tools and machinery. Steel is used in the construction of agricultural machinery, such as tractors and combines, which are essential to modern agriculture. Steel is also used in the production of farming tools, such as plows, hoes, and sickles.

Conclusion

Through the utilization of waste plastics, Nippon Steel contributes to reducing waste and improving the environment. The company is committed to creating a circular economy by recycling waste plastics and promoting waste reduction. Nippon Steel’s efforts in waste reduction and recycling demonstrate the company’s commitment to sustainability and its role in creating a sustainable future.
Promotion of Environmental Risk Management

Activities for reducing environmental risks

- **Atmospheric risk management**
  
  In order to reduce emissions of sulfur oxides (SOx) and nitrogen oxides (NOx), Nippon Steel is taking measures such as using low-sulfur fuel, adopting low NOx generating burners and installing effective equipment, including equipment that reduces SOx and NOx emissions. To curb emissions of soot and dust generated from factories and raw material yard, we try to enhance their collection by installing dust collectors and prevent scattering of particles by installing windscreen doors, windscreen trees and sprinklers, based on air pollution risk analysis through scientific simulation. We also conduct constant monitoring and regular patrols to ensure that no abnormal emissions are released.

  Since April 2018, mercury concentration in emission gas has been regulated in Japan. At our facilities mercury contained in waste gas is effectively captured by dust collectors or is absorbed by activated carbon. We have confirmed that all of our facilities, including waste incinerators which are regulated for mercury concentration, conform to the regulations.

  For sintering furnaces and electric arc furnaces for steelmaking, we voluntarily manage their mercury concentration in accordance with a voluntary management standard, issued by the Japan Iron and Steel Federation (JISF) in April 2018. We have carried out voluntary measurement and confirmed conformity with the voluntary management standard at all facilities subject to the voluntary initiatives in fiscal 2020. These results and evaluations are disclosed on the JISF’s website in around September every year. Through such efforts, we strive to prevent mercury emission into the air.

- **Waste water management**
  
  We use about 5.9 billion m³ of industrial water a year, of which approximately 90% is derived from recycled or reused water to reduce wastewater discharge, at all of our steelworks and factories combined. We try not to waste precious water resources, and to control wastewater discharge. To achieve this, we make daily efforts to maintain and improve the performance of wastewater treatment equipment, and the inspection and control of wastewater quality. Our operational bases in Japan are evaluated by the World Resources Institute (WRI) Aqueduct to confirm that we are not to be prone to high-level water stress. Nevertheless, in preparation of the remote chance of a water intake restriction, some of our steelworks possess their own water reservoir. In certain circumstances, we contribute to easing water stress of the community by providing water for agricultural use or by cooperating in other ways. In consideration of the importance of complying with the Water Pollution Control Law and preserving the water quality in the sea area to which it is discharged, we ensure that in the event of an operational problem the drainage outlets will not release abnormal wastewater outside the steelworks. Water drainage automatic monitoring systems, water shutdown gates, emergency reservoirs, etc. are installed to prevent water pollution.

  We also strive to check, repair, and maintain equipment in order to prevent water pollution, and to train our personnel in methods of checking of operations and controlling work procedures. Moreover, our steelworks have taken measures, such as to install a large storage tank so that water tainted with iron ore powder would not directly be released into the sea even if our steelworks were struck by a local torrential rain caused by weather abnormality. If there is a crack in an embankment facing the sea, there is a risk of a leakage of groundwater with unknown contaminants. In order to prevent this, the embankment is regularly inspected from the sea side enabling us to maintain and manage it in a sound condition. In areas with potential risk of leakage of water which may exceed permissible levels of contaminants, a leakage of groundwater with unknown contaminants. In order to prevent this, the embankment is regularly inspected from the sea side enabling us to maintain and manage it in a sound condition.

  We use about 5.9 billion m³ of industrial water a year, of which approximately 90% is derived from recycled or reused water to reduce wastewater discharge, at all of our steelworks and factories combined. We try not to waste precious water resources, and to control wastewater discharge. To achieve this, we make daily efforts to maintain and improve the performance of wastewater treatment equipment, and the inspection and control of wastewater quality. Our operational bases in Japan are evaluated by the World Resources Institute (WRI) Aqueduct to confirm that we are not to be prone to high-level water stress. Nevertheless, in preparation of the remote chance of a water intake restriction, some of our steelworks possess their own water reservoir. In certain circumstances, we contribute to easing water stress of the community by providing water for agricultural use or by cooperating in other ways. In consideration of the importance of complying with the Water Pollution Control Law and preserving the water quality in the sea area to which it is discharged, we ensure that in the event of an operational problem the drainage outlets will not release abnormal wastewater outside the steelworks. Water drainage automatic monitoring systems, water shutdown gates, emergency reservoirs, etc. are installed to prevent water pollution.

  We also strive to check, repair, and maintain equipment in order to prevent water pollution, and to train our personnel in methods of checking of operations and controlling work procedures. Moreover, our steelworks have taken measures, such as to install a large storage tank so that water tainted with iron ore powder would not directly be released into the sea even if our steelworks were struck by a local torrential rain caused by weather abnormality. If there is a crack in an embankment facing the sea, there is a risk of a leakage of groundwater with unknown contaminants. In order to prevent this, the embankment is regularly inspected from the sea side enabling us to maintain and manage it in a sound condition. In areas with potential risk of leakage of water which may exceed permissible levels of contaminants, a board or sheet water barrier may be installed so as to prevent leakage even if a crack develops on the embankment.

  Emission of SOx and NOx

<table>
<thead>
<tr>
<th>Year</th>
<th>SOx (10E6 m³)</th>
<th>NOx (10E6 m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>2015</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>2016</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>2017</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>2018</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>2019</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>2020</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

- **Efficiency improvement of energy generation**
  
  Nippon Steel is promoting management of environmental risk with the aim of continually enhancing preservation of the environment in various regions, with due consideration of environmental risks, which differ by each steelworks and factory, and with due consideration to compliance with Japan’s Air Pollution Control Act and other regulations.
Promotion of Environmental Risk Management

**Soil risk management**

We are taking appropriate measures in compliance with the Soil Contamination Countermeasures Act, guidelines issued by the Ministry of the Environment, local government ordinances, and so on. We report to the local government when performing landform modification work such as excavation which is required to be reported. We conduct pollution surveys when needed.

Starting in fiscal 2018, the Revised Soil Contamination Countermeasures Act is being enforced in stages and will be expanded. We will continue to comply with relevant ordinances.

**Management of discharged chemical substances**

**Comprehensive management of discharge**

Nippon Steel appropriately manages and tries to improve the production handling, handling, and discharge or disposal of chemical substances in accordance with the Chemical Substance Management Law*, Chemical Substance Evaluation and Regulation Law*, and other laws concerning the management of chemical substances as well as the procedures employed. According to the targets of the Chemical Substance Management Law, we thoroughly manage the material balance, which includes the amount of chemical substances handled, the amount discharged to the environment, disposable amount, and the amount used as products. Similarly, we take care in managing the Volatile Organic Compounds (VOC), which are said to cause photochemical oxidants and suspended particulate matter. In complying with the Chemical Substance Management Law and Regulation Law, we identify and provide notification of the amounts of production and sales of the targeted chemical substances.

Nippon Steel also took the lead in promoting use of alternatives to using sheetmaking materials and equipment that contain hazardous materials such as polychlorinated biphenyls (PCBs) and mercury. According to safe handling standards, we systematically replace or dispose of these hazardous materials, set the time limit for disposal, and stipulate for each area.

**Management of discharge based on the Chemical Substance Management Law**

In 1999, two years before the enforcement of the Chemical Substance Management Law, Nippon Steel began surveying chemical substances according to the voluntary control manual developed by the Japan Iron and Steel Federation (JISF). At present, in compliance with the Chemical Substance Management Law, Nippon Steel monitors 462 chemical substances and tries to control their emission and improve the way we manage them. In fiscal 2020, there were 53 target substances for notification and the emission amount was 34.4 tons into the atmosphere and 30 tons to public water areas, while the disposal amount of mostly manganese, chrome, other metals, and their compounds to outside of the steelworks was 5,480 tons in aggregate.

Every year, data is compiled by each steelworks and experience in handling standards, we systematically replace or dispose of these hazardous parts and materials, giving the time limit for disposal or the expiration date, stipulated for each area.

**Voluntary priority control of select chemical substances**

**Dioxin**

Some of our facilities, such as sintering facilities and incineration facilities, are a source of emissions of dioxins into the atmosphere. All these facilities have conformed to the emission concentration standard and have achieved levels of emissions below the voluntary reduction target, based on the JISF guidelines, relative to fiscal 1997.

**Benzene, tetrachloroethylene, dichloromethane**

We developed a voluntary reduction plan of hazardous air pollutants specified in the environmental standard, which we handle. As a result of our systematic undertaking, we have already reached the targets for all three pollutants and have been maintaining the target levels.

**Appropriate treatment of industrial waste**

In order to appropriately handle industrial waste generated in our business activities, we thoroughly carry out (1) management by sorting industrial waste depending on the status of its occurrence, (2) appropriate selection and continuous management of collectors, transporters, and disposal contractors, and (3) appropriate management of Manuals (industrial waste management documentation).

In order to enhance compliance in waste treatment by appropriately managing the Manuals, all Nippon Steel steelworks and offices have adopted the e-Manifest system and fully utilize it for waste management. We also evaluate collectors, transporters, and disposal contractors based on our internal rules and conduct on-site inspections at predetermined frequency, so as to continuously and appropriately ensure proper management.

**Emissions reduction of volatile organic compounds (VOC)**

Nippon Steel is working to reduce VOC emissions, which are said to be the cause of photochemical oxidants and airborne particulate matter.

After collecting the VOC-containing gases emitted from the manufacturing process, the gas is conveyed away and detoxified in the combustion furnace or recovered as a liquid in an adsorption tower.

The combustion furnace (photo) located in the East Nippon Works Kitatsuka Area treats gas containing VOC, such as benzene, to 980°C or higher and decomposes it into water and carbon dioxide. The decomposition efficiency of VOC in this combustion furnace is greater than 99.9%, contributing significantly to the reduction of VOC emissions. We have already achieved our voluntary reduction targets for VOC emissions and benzene emissions, but will continue to further reduce emissions.

**Responding to water resource risk — a system for recycling of industrial water in steelworks**

Nippon Steel recycles and reuses most of the water used in the steelmaking process, with a small remaining portion to be properly treated and discharged out of the steelworks. In the case of reusing water, it is cooled and cleaned once it is used, and various treatments are carried out depending on the application. We therefore thoroughly inspect and maintain each processing facility and control the water quality in daily operations.

**Environmental measures taken in steelworks**

**Emissions reduction of volatile organic compounds (VOC)**

Nippon Steel is working to reduce VOC emissions, which are said to be the cause of photochemical oxidants and airborne particulate matter. After collecting the VOC-containing gases emitted from the manufacturing process, the gas is conveyed away and detoxified in the combustion furnace or recovered as a liquid in an adsorption tower. The combustion furnace (photo) located in the East Nippon Works Kitatsuka Area treats gas containing VOC, such as benzene, to 980°C or higher and decomposes it into water and carbon dioxide. The decomposition efficiency of VOC in this combustion furnace is greater than 99.9%, contributing significantly to the reduction of VOC emissions. We have already achieved our voluntary reduction targets for VOC emissions and benzene emissions, but will continue to further reduce emissions.

**Responding to water resource risk — a system for recycling of industrial water in steelworks**

Nippon Steel recycles and reuses most of the water used in the steelmaking process, with a small remaining portion to be properly treated and discharged out of the steelworks. In the case of reusing water, it is cooled and cleaned once it is used, and various treatments are carried out depending on the application. We therefore thoroughly inspect and maintain each processing facility and control the water quality in daily operations.

**Environmental measures taken in steelworks**

**Emissions reduction of volatile organic compounds (VOC)**

Nippon Steel is working to reduce VOC emissions, which are said to be the cause of photochemical oxidants and airborne particulate matter. After collecting the VOC-containing gases emitted from the manufacturing process, the gas is conveyed away and detoxified in the combustion furnace or recovered as a liquid in an adsorption tower. The combustion furnace (photo) located in the East Nippon Works Kitatsuka Area treats gas containing VOC, such as benzene, to 980°C or higher and decomposes it into water and carbon dioxide. The decomposition efficiency of VOC in this combustion furnace is greater than 99.9%, contributing significantly to the reduction of VOC emissions. We have already achieved our voluntary reduction targets for VOC emissions and benzene emissions, but will continue to further reduce emissions.

**Responding to water resource risk — a system for recycling of industrial water in steelworks**

Nippon Steel recycles and reuses most of the water used in the steelmaking process, with a small remaining portion to be properly treated and discharged out of the steelworks. In the case of reusing water, it is cooled and cleaned once it is used, and various treatments are carried out depending on the application. We therefore thoroughly inspect and maintain each processing facility and control the water quality in daily operations.
**Initiatives on Conservation of Biodiversity**

**Policy for the initiatives**

We will promote the initiatives on conservation of biodiversity, which are closely aligned with measures to deal with climate change and creation of a circular economy, under the following policy.

- As a member of Nippon Keidanren, we comply with the “Declaration of Biodiversity by Keidanren and Action Policy”.
- Recognizing both that our business activities greatly rely on the nature’s gifts, and that biodiversity is vital for realizing a sustainable society, we understand the relationships of our business activities with biodiversity and are pledged to respond to challenges rooted in diverse local features, in order to build a society in harmony with nature.
- As a member of the international community, we also recognize that initiatives aimed at building a society in harmony with nature are closely related to global issues of measures to deal with climate change and creation of a circular economy. We aim to realize a sustainable society through an integrated environmental corporate management which includes these initiatives in business activities.

**“Creation of Hometown Forests”**

Reproducing “the grove of a village shrine” and nurture biodiversity

We have carried out the “Creation of Hometown Forests” projects at our steelworks and factories in Japan under the guidance of Dr. Akira Miyawaki (professor emeritus of Yokohama National University), with the aim of facilitating harmonious coexistence between nature and humans. This project comprises research on the natural vegetation inherent to a certain area in a nearby grove associated with a historical shrine (Chinji-ro-mon), careful selection of suitable trees, growth of their saplings in pots, and planting them in designated places by local residents and our employees. This was the first project by a private company in Japan to create a forest that harmonizes with the local scene and is based on an ecological approach. This is one way we try to raise the awareness of our employees regarding the environment. At present, our forests in aggregate have grown to total around 830 ha (about the size of 180 Yankee Stadiums).

**“Creation of Sea Forests”**

Implemented in 38 spots in Japan to improve sea desertification

With the aim of offsetting a part of the decline in the supply of iron from nature, which is said to be one of the causes of sea desertification, Nippon Steel has developed the Vivary™ Unit via joint research with The University of Tokyo and uses it to promote regeneration of seaweed beds.

While humic acid is the combination of iron ions and humic acid in the soil of a land forest in the natural environment, we have developed the technology to artificially generate humic acid that can be used to improve the growth and humic substance originated from waste wood. The Vivary™ Unit has received a safety certificate from the Safety Check and Certification System of steel slag products of the National Federation of Fisheries Cooperative Associations.

In Mashike Town, Hokkaido, starting from an experiment in 2004, we developed a large-scale project (300-meter coastal line) by 2014, confirming expansion of seaweed beds and an increase in intake of sea urchin. This project is also expected to restore once-atrophied seabed and steadily raise biodiversity.

**Participation in community projects**

Participation in ecological preservation activities in the community

Since 2012, the Nagoya Works of Nippon Steel has participated in the Inochi-wo-Tsunagu (Life Sustaining) Project, which consists of the students’ planning committee, 11 companies, Eco-Asset Consortium and Japan Ecologist Association of Support (NPO). This project seeks to develop an ecosystem network to link green areas at each company site and vicinity. To thereby increase the potential of the linked areas, an animal pathway was established and a fixed point observation camera has recorded raccoons coming and going through the pathway. The project also included experience-based activities, including corporate greenery sites, fun-filled learning events for families, and craft-making events. Being highly evaluated 1) as a community building, corporate-government-student alliance, 2) for its creation of an ecosystem network in multiple companies’ extensive, combined greenery space, and 3) as a model suitable for use elsewhere, the project has received the 46th Environment Award (Special Jury Award), co-sponsored by National Institute for Environmental Studies (NIES) and the Nikkan Kogyo Shimbun newspaper, and supported by the Ministry of the Environment.

**Contribution by use of by-products**

Steel slag, a by-product of steelmaking, contains nutritional matter that helps grow plants. It is therefore used as a fertilizer for rice cultivation, dry-field farming, and pasture grass. Slica contained in steel slag promotes photosynthesis by keeping leaves upright and improving their light receiving area. Meanwhile, iron ions in steel slag fertilizers to cooperate for research by Tokyo University of Agriculture for salt removal in farmland in the Soma area of Fukushima Prefecture, which was devastated by the earthquakes and tsunami of March 2011. The steel slag fertilizers have proved effective in rapid and efficient salt removal. The restoration of rice fields also means to restore habitats for birds, frogs, and various other living things.
Promotion and Enhancement of Environmental Management

Environmental management structure

Nippon Steel routinely follows the management cycle of PDCA, primarily through the work of the Environmental Management Committee, which is held twice a year, to promote improvement of management. Positioning environmental risks as management issues, we have deployed a procedure that the Committee’s activities are supervised by the Board of Directors, wherein environmental risks, related to climate change, air, water, and waste (among others), are given attention by the Environmental Management Committee that subsequently reports to the Board of Directors and the Management Committee. As a part of the enhancement of governance, environmental general manager meetings and environmental group leader meetings, with participation by all steelworks, are regularly held. In particular, Nippon Steel seeks to reduce risks related to sedimented dust, wastewater, and waste including activities. These efforts are based on the work of experts, conferences held for each of these areas. In addition, the Environmental Management Committee conducts specific risk management activities concerning climate change, as it involves significant risks in the long term.

Environmental system

In accordance with the international standard ISO 14001, Nippon Steel has built an environmental management system, with each steelwork general manager serving as the responsible person. Each year, in addition to an environmental management system, with each steelwork general manager, each steelworks is audited by the Head Office Environment Department. Nippon Steel has built an environmental management system, with each steelwork general manager serving as the responsible person. Each year, in addition to environmental audits, each Group company and included companies are given attention by the Environmental Management Committee through the work of the Environmental Management Committee, which is held twice a year, to promote improvement of management. Positioning environmental risks as management issues, we have deployed a procedure that the Committee’s activities are supervised by the Board of Directors, wherein environmental risks, related to climate change, air, water, and waste (among others), are given attention by the Environmental Management Committee that subsequently reports to the Board of Directors and the Management Committee. As a part of the enhancement of governance, environmental general manager meetings and environmental group leader meetings, with participation by all steelworks, are regularly held. In particular, Nippon Steel seeks to reduce risks related to sedimented dust, wastewater, and waste including activities. These efforts are based on the work of experts, conferences held for each of these areas. In addition, the Environmental Management Committee conducts specific risk management activities concerning climate change, as it involves significant risks in the long term.

Environmental audits

In accordance with the international standard ISO 14001, Nippon Steel has built an environmental management system, with each steelwork general manager serving as the responsible person. Each year, in addition to an internal auditing of each steelworks and a management review by its general manager, each steelworks is audited by the Head Office Environment Department. Environmental officers of other steelworks and facilities also participate in these audits to cross-check. In addition, periodic reviews are conducted by the ISO certification agency.

For the group companies (84 companies subject to environmental regulation) including those overseas, a direct interview is conducted by a member of the Head Office Environment Department to improve management levels. This is part of the corporate government conducted by the Head Office Internal Control Audit Department.

Environmental conference participated in by group companies

From the group companies in Japan, Nippon Steel has identified 59 companies (as of April 2021) having certain environmental impact and holds meetings for those companies twice a year. In the meetings, the latest trends of environmental laws and regulations are studied, cases of environmental initiatives are reported, and other information is shared with the goal of reducing environmental risks.

Environmental accounting

Philosophy of environmental accounting

Nippon Steel has adopted environmental accounting to be used as guidelines for corporate activities, and to accurately track the environmental costs and effects. The iron and steel industry is an equipment-intensive industry. We have achieved environmental preservation and environ. Nippon Steel has built an environmental management system, which includes own operations and consulting services, to reduce environmental risks. Nippon Steel has identified 59 companies (as of April 2021) having certain environmental impact and holds meetings for those companies twice a year. In the meetings, the latest trends of environmental laws and regulations are studied, cases of environmental initiatives are reported, and other information is shared with the goal of reducing environmental risks.

Environmental conference participated in by group companies

From the group companies in Japan, Nippon Steel has identified 59 companies (as of April 2021) having certain environmental impact and holds meetings for those companies twice a year. In the meetings, the latest trends of environmental laws and regulations are studied, cases of environmental initiatives are reported, and other information is shared with the goal of reducing environmental risks.

Environmental accounting

Environmental conference participated in by group companies

From the group companies in Japan, Nippon Steel has identified 59 companies (as of April 2021) having certain environmental impact and holds meetings for those companies twice a year. In the meetings, the latest trends of environmental laws and regulations are studied, cases of environmental initiatives are reported, and other information is shared with the goal of reducing environmental risks.

Environmental accounting

Effects of environmental preservation

It is difficult to quantify environmental preservation effects in monetary terms, since such calculation would require many assumptions. Therefore, environmental preservation performance is reported as effects vs. costs of taking environmental measures in this report and on our website. For example, reduction in energy consumption is shown on page 25, water consumption volume on page 37, and various measures spent on page 43. For atmospheric substances, SOx and NOx emissions are shown; for water quality and solids, individual performance indicators are used; for hazardous chemical substances, actual reduction volume of substances such as dyes, benzene, and VOCS are stated, and for waste products, reduction in final disposal volume is stated.

Environmental preservation costs

For fiscal 2020, capital expenditures for environmental preservation amounted to 19.4 billion yen in total, or approximately 4% of the company’s capital expenditures. Investment in environmental preservation activities in fiscal 2020 included preventive measures for dust emissions, visible smoke emitted from steelworks stacks, extreme water discharge from drain outlets, and leakage of water from the rivetments and quay walls at steelworks. Investment in energy-saving equipment of 2.4 billion yen comprises measures to improve the efficiency of reheating furnaces as well as overall energy-saving measures in each manufacturing process. Environmental preservation costs totaled 101.2 billion yen, including 53.4 billion yen in air pollution prevention costs, 11.3 billion yen in water pollution prevention costs, 2.1 billion yen in costs for energy-saving measures, and 13.2 billion yen in environmental R&D costs. Expenses for waste disposal were reduced by promoting in-house recycling.

Environmental preservation costs

Environmental conference participated in by group companies

From the group companies in Japan, Nippon Steel has identified 59 companies (as of April 2021) having certain environmental impact and holds meetings for those companies twice a year. In the meetings, the latest trends of environmental laws and regulations are studied, cases of environmental initiatives are reported, and other information is shared with the goal of reducing environmental risks.

Environmental accounting

Effects of environmental preservation

It is difficult to quantify environmental preservation effects in monetary terms, since such calculation would require many assumptions. Therefore, environmental preservation performance is reported as effects vs. costs of taking environmental measures in this report and on our website. For example, reduction in energy consumption is shown on page 25, water consumption volume on page 37, and various measures spent on page 43. For atmospheric substances, SOx and NOx emissions are shown; for water quality and solids, individual performance indicators are used; for hazardous chemical substances, actual reduction volume of substances such as dyes, benzene, and VOCS are stated, and for waste products, reduction in final disposal volume is stated.

Environmental preservation costs

For fiscal 2020, capital expenditures for environmental preservation amounted to 19.4 billion yen in total, or approximately 4% of the company’s capital expenditures. Investment in environmental preservation activities in fiscal 2020 included preventive measures for dust emissions, visible smoke emitted from steelworks stacks, extreme water discharge from drain outlets, and leakage of water from the rivetments and quay walls at steelworks. Investment in energy-saving equipment of 2.4 billion yen comprises measures to improve the efficiency of reheating furnaces as well as overall energy-saving measures in each manufacturing process. Environmental preservation costs totaled 101.2 billion yen, including 53.4 billion yen in air pollution prevention costs, 11.3 billion yen in water pollution prevention costs, 2.1 billion yen in costs for energy-saving measures, and 13.2 billion yen in environmental R&D costs. Expenses for waste disposal were reduced by promoting in-house recycling.

Environmental preservation costs

Environmental conference participated in by group companies

From the group companies in Japan, Nippon Steel has identified 59 companies (as of April 2021) having certain environmental impact and holds meetings for those companies twice a year. In the meetings, the latest trends of environmental laws and regulations are studied, cases of environmental initiatives are reported, and other information is shared with the goal of reducing environmental risks.

Environmental accounting

Effects of environmental preservation

It is difficult to quantify environmental preservation effects in monetary terms, since such calculation would require many assumptions. Therefore, environmental preservation performance is reported as effects vs. costs of taking environmental measures in this report and on our website. For example, reduction in energy consumption is shown on page 25, water consumption volume on page 37, and various measures spent on page 43. For atmospheric substances, SOx and NOx emissions are shown; for water quality and solids, individual performance indicators are used; for hazardous chemical substances, actual reduction volume of substances such as dyes, benzene, and VOCS are stated, and for waste products, reduction in final disposal volume is stated.

Environmental preservation costs

For fiscal 2020, capital expenditures for environmental preservation amounted to 19.4 billion yen in total, or approximately 4% of the company’s capital expenditures. Investment in environmental preservation activities in fiscal 2020 included preventive measures for dust emissions, visible smoke emitted from steelworks stacks, extreme water discharge from drain outlets, and leakage of water from the rivetments and quay walls at steelworks. Investment in energy-saving equipment of 2.4 billion yen comprises measures to improve the efficiency of reheating furnaces as well as overall energy-saving measures in each manufacturing process. Environmental preservation costs totaled 101.2 billion yen, including 53.4 billion yen in air pollution prevention costs, 11.3 billion yen in water pollution prevention costs, 2.1 billion yen in costs for energy-saving measures, and 13.2 billion yen in environmental R&D costs. Expenses for waste disposal were reduced by promoting in-house recycling.

Environmental preservation costs

Environmental conference participated in by group companies

From the group companies in Japan, Nippon Steel has identified 59 companies (as of April 2021) having certain environmental impact and holds meetings for those companies twice a year. In the meetings, the latest trends of environmental laws and regulations are studied, cases of environmental initiatives are reported, and other information is shared with the goal of reducing environmental risks.

Environmental accounting

Effects of environmental preservation

It is difficult to quantify environmental preservation effects in monetary terms, since such calculation would require many assumptions. Therefore, environmental preservation performance is reported as effects vs. costs of taking environmental measures in this report and on our website. For example, reduction in energy consumption is shown on page 25, water consumption volume on page 37, and various measures spent on page 43. For atmospheric substances, SOx and NOx emissions are shown; for water quality and solids, individual performance indicators are used; for hazardous chemical substances, actual reduction volume of substances such as dyes, benzene, and VOCS are stated, and for waste products, reduction in final disposal volume is stated.

Environmental preservation costs

For fiscal 2020, capital expenditures for environmental preservation amounted to 19.4 billion yen in total, or approximately 4% of the company’s capital expenditures. Investment in environmental preservation activities in fiscal 2020 included preventive measures for dust emissions, visible smoke emitted from steelworks stacks, extreme water discharge from drain outlets, and leakage of water from the rivetments and quay walls at steelworks. Investment in energy-saving equipment of 2.4 billion yen comprises measures to improve the efficiency of reheating furnaces as well as overall energy-saving measures in each manufacturing process. Environmental preservation costs totaled 101.2 billion yen, including 53.4 billion yen in air pollution prevention costs, 11.3 billion yen in water pollution prevention costs, 2.1 billion yen in costs for energy-saving measures, and 13.2 billion yen in environmental R&D costs. Expenses for waste disposal were reduced by promoting in-house recycling.
Nippon Steel uses raw materials iron ore mined overseas, coal as material of coke for reduction of iron ore, and steel scrap generated by society, and produces steel products by using industrial water and energy, such as electricity and fuel. Nippon Steel’s manufacturing bases make utmost efforts at achieving efficient use of resources and energy in every manufacturing process, and utilize limited resources and energy so as there can be no waste. Specific efforts include improvement in product yield, efficient use of equipment, enhancement of efficiency in combustion, and reduced electricity use.

**Efficient use of resources**

1. **Water resources**
   - Of water used in cooling and cleaning of products and manufacturing facilities, 90% is reprocessed and repeatedly used, while the remaining 10%, which disappears mainly due to evaporation, is replaced.

2. **Electricity**
   - Nippon Steel itself generates 91% of the electricity it uses at steelworks, 72% of which is from internally generated energy sources such as exhaust heat and by-product gases. In the future, we will also consider making more efficient facilities and switching fuel in order to further lower carbon generation.

3. **By-product gas**
   - By-product gases, such as coke oven gas generated when coal is thermally cracked in an oxygen-free environment in the coke manufacturing process and blast furnace gas generated from blast furnaces, are fully utilized as fuel gas for steel heating furnaces or energy sources for power generation plants on the premises of steelworks.

4. **Use of exhaust heat**
   - Exhaust heat, generated in the blast furnaces, sintering facilities, coke ovens, converters, and other facilities, is recovered and used in steam generation and power generation. In fiscal 2020, the suspension of coke furnaces and related equipment that stemmed from a significant reduction in production resulted in a decrease in waste heat recovery steam.

5. **By-products**
   - By-products generated in steelmaking are recycled for reuse in the same process or for commercial use. We thus promote achieving zero emission and contribution to conservation of resources and energy.

6. **Recycling of waste plastics**
   - Approximately 200,000 tons per year, or about 30% of plastic containers and packaging collected from households nationwide, are fully recycled by a chemical processing method using coke furnaces.
Safety, Disaster Prevention and Quality

Safety and health initiatives

Reducing disaster risks to zero, and group-wide sharing of effective measures

We make a risk assessment when planning a new project and regularly conduct safety and risk assessment for existing projects, to prevent accidents and reduce risks. We also seek for greater safety of equipment even when such equipment is essentially safe, and take countermeasures against human error. We also actively promote use of IT in safety measures, such as checking worker location data via GPS, safety surveillance cameras, and helmet-mounted cameras. Analysis of actual accidents for prevention of similar accidents and making known effective examples of accident-preventive measures. As a result of a continuous execution of these measures, safety has improved in fiscal 2020. There were 3 accidents for Nippon Steel’s employees1, and 16 for employees of subcontracting companies (including zero fatal accident for Nippon Steel and two in subcontracting companies). The accident frequency rate was 0.09 (compared to Japan’s steel industry average of 0.87) and the accident severity rate was 0.08 (vs. 0.14). We will continue to strive for a safer work environment with the safety wellness targets for fiscal 2021 that are zero fatalities/severe accidents and less than 0.10 as the accident frequency rate.

 Acquisition of third-party certification

In fiscal 2019 Nippon Steel adopted a plan for all our steelworks and offices to obtain the ISO (JIS Q) 45001 Health and Safety Certification (published in March 2018) by the end of fiscal 2021 and they have been acquiring it one by one.

Safety training

We make efforts to improve training for accident prevention. The safety training programs are attended by all newly-appointed managers of manufacturing workplaces (91 managers in fiscal 2019, 42 in fiscal 2019 and 81 in fiscal 2020). Our Safety Program (an experience-based safety education program) allows employees to experience workplace risk through simulation, so as to better prepare them in anticipating and managing risk.

Disaster prevention initiatives

Initiatives to reduce disaster risks

Nippon Steel’s Plant Safety Division is promoting initiatives for risk reduction in disaster prevention by working in three areas of focus: 1) corporate-wide disaster prevention management of each steelworks; 2) understanding of the control intervention of each works; and 3) voluntary monitoring (auditing) concerning appropriate implementation of 1) and 2), by persons in charge of disaster prevention in each works; understanding of the control status through sessions with managers at the head office; and implementation of corrections, if needed. Targeting zero serious disaster-related accidents, we promote essential disaster prevention improvement measures in manufacturing sites.

Specific disaster prevention initiatives

• Prevention of disaster recurrence (mitigating risks exposed by disaster)
  • Enhance risks (in initial response critical at all places in an earthquake, enhanced risk profile for areas of centralized training facilities, improvement of hazard sensitivity by use of CO2, etc.)
  • Improve fire-fighting capacity of the in-house fire defense function, in cooperation with experts (joint drills of public fire fighters; training for leaders, etc.)
  • Prevent targeting past incidents and accidents (panel presentations in training facilities, session to learn about past incidents during training)

• Disaster prevention risk assessment (identification of new potential disaster risk)
  • Identify and assess risks in manufacturing sites based on the corporate-wide guidelines, manage residual risk, and conduct and promote permanent measures
  • Identify accident risks related to operating processes and facility design and promote the drafting of permanent measures by outside experts and the process technology division in the head office

• Measures to mitigate existing risks (measures for disaster prevention equipment)
  • Present disaster recurrence, investment in measures for compliance and risk assessment

• Auditing concerning disaster prevention
  • Stabilized monitoring by disaster prevention organization at each steelworks for regular check-ups and corrective action on the status of disaster prevention activities at all the manufacturing work front
  • Regular check-up and corrective action on the implementation status of disaster prevention management of each steelworks on the basis of the hearings in the head office

• Measures against earthquakes and tsunami and measures for natural disaster mitigation
  • Promote measures against earthquakes in the order of 1) human injury prevention, 2) area damage prevention, and 3) production measures
  • Prepare procedures and devise measures for disaster mitigation to the seven categories of natural disasters (earthquakes, tsunamis, lightning, heavy rains, floods, lightning, landslide, heavy snow, volcanic eruption)

• Third-party monitoring toward enhancing safety competency in steelworks
  • Assessment of seawards by JIS, the Japan Safety Competence Center
  • Group companies disaster prevention management
    • Meetings to enhance coordination for disaster prevention management, individual visits to a workplace where a disaster or accident happened or which has risks related to disaster prevention

Quality-related initiatives

Activities aimed at strengthening the quality assurance system of the Nippon Steel Group

As a basic policy in line with the Japan Iron and Steel Federation’s guideline, aimed at strengthening the quality assurance system, we are promoting 1) the enhancement of education on quality compliance (compliance with laws and regulations), 2) activities to reduce behavioral risks, and 3) advanced internal quality audit. Information on quality-related examples is promptly shared across the Group and at appropriate times measures are launched to resolve issues through standardization, systematization, automatization, and other action. These measures are further implemented to enhance identification of actual problems and an improvement of testing and inspection. In addition, the newly defined basic rules of quality behavior have been made known to all employees, with a focus on improving the awareness in quality compliance and preventing quality problems to occur.

Specific initiatives

Enhancement of education on quality compliance

• Enhancement of quality compliance education opportunities (IT utilization, e-learning)
  • Stressed application of the five basic rules of quality behavior (in the workplace, work-related education, education for all employees)
  • Promotion of standardization and improvement in capacity of staff

Activities to reduce behavioral risks (risks of human intervention)

• Enhanced identification management and reliability of finding and inspection by promoting automation and systematization
  • Follow-up on the effectiveness of the system to prevent occurrence of test results

Advanced internal quality audit

• Periodic audit by the Quality Assurance Department of the Head Office
  • External audit by acquiring certification of ISO 9001, JIS, etc.
  • Present own initiative audits by educating internal audit staff and improving their capacity

Introduction

Nippon Steel’s ESG Materiality

Corporate Governance

Environmental Initiatives

Social Initiatives

Environmental

Specific initiatives

Enhancement of education on quality compliance

• Enhancement of quality compliance education opportunities (IT utilization, e-learning)
  • Stressed application of the five basic rules of quality behavior (in the workplace, work-related education, education for all employees)
  • Promotion of standardization and improvement in capacity of staff

Activities to reduce behavioral risks (risks of human intervention)

• Enhanced identification management and reliability of finding and inspection by promoting automation and systematization
  • Follow-up on the effectiveness of the system to prevent occurrence of test results

Advanced internal quality audit

• Periodic audit by the Quality Assurance Department of the Head Office
  • External audit by acquiring certification of ISO 9001, JIS, etc.
  • Present own initiative audits by educating internal audit staff and improving their capacity
Respect for Human Rights

Basic policy

In compliance with the Universal Declaration of Human Rights and other international norms on human rights, Nippon Steel has a policy of preventing and rescinding both types of labor. We conduct regular monitoring surveys of our Group companies to prevent such violations in our business activities.

Addressing human rights risks

From the viewpoint of promoting human rights (HR) awareness activities by assigning human rights awareness advocates at each steelworks and each office, and of implementing corporate-wide human rights awareness activities, we hold a “corporate-wide forum of human rights awareness advocates” in March each year to exchange views on human rights awareness education and new human rights risks, and to consider the related action policy for the next fiscal year. Based on this, we conduct a “corporate-wide forum of human rights anti-discrimination promotion” at the beginning of the fiscal year, chaired by the Executive Officer in charge of Human Resources, with the HR managers of each steelworks and each office as members. At this forum, the fiscal year’s policy for promoting human rights development is determined.

In addition to implementing human rights awareness activities in accordance with the policies decided at the forum, each steelworks and each office are actively engaged in employee awareness-raising activities, including holding workshops on a specific issue of the steelworks or office. We also participate in enlightenment organizations and activities hosted by public entities and others in each community. We do this as concerted efforts for human rights enlightenment with the communities.

Along with the group-wide expansion of our efforts to Group companies in Japan and overseas, monitoring surveys on the status of compliance with labor-related laws and regulations, the establishment of consultation contacts, and other issues are regularly conducted via a checklist on internal controls. Through these efforts, we are continuously and systematically promoting activities to prevent human rights abuses. This includes the understanding of human rights risks that change with the times and the development of a system and a strategy to reduce the risks.

Prevention of forced or child labor

Adhering to international norms concerning forced or child labor, Nippon Steel has a policy of preventing and rescinding both types of labor. We conduct regular monitoring surveys of our Group companies to prevent such violations in our business activities.

Compliance concerning salaries

In compliance with laws and regulation concerning salary and wages payment, Nippon Steel has set up a pay at a higher level than minimum wage stipulated by the country, region, and type of work where we do business. With regard to bonuses, we regularly survey related matters, including the status of each country, region, and type of work, and hold meetings with labor representatives, to appropriately reward employees with due consideration given to business conditions and financial performance.

Human rights awareness education

Based on the policy decided at the “corporate-wide forum of human rights anti-discrimination promotion,” information on human rights awareness is incorporated in training courses for all ranks, from new employees to experienced ones. We also provide education on a variety of subjects, including the issues of harassment and anti-discrimination, understanding of LGBTIQ, and human rights issues in the conduct of our business.

Two-way communication with employees based on good labor-management relations is important in order to prevent human rights abuses. We therefore incorporate education toward building sound labor-management relationships in training of executives of the Company and the Group companies.

In addition to general education that contributes to the prevention of human rights abuses, reports and consultations from various stakeholders are accepted, including lawyers and outside professional organizations, to protect the privacy of the persons and to ensure that they do not receive unfavorable treatment. We then provide guidance and education to those involved, and strive to appropriately resolve the incidents.

Furthermore, since labor-management relations play an important role in preventing human rights abuses and resolving related incidents, in the event of disputes concerning the interpretation of collective agreements, labor-management agreements or other rules directly related to them, a grievance committee is established to resolve the dispute, based on the agreement concerning complaint handling procedures that has been concluded with the labor union. The committee comprises members from both the management and the labor side.

Communicating with stakeholders

Adhering to laws and the group-company labor agreements, and respecting the rights to organize and to bargain, Nippon Steel strives to maintain sound labor-management relationships. With a focus on mutual understanding through two-way dialogue, we have a place for discussion with labor unions for the entire Company as well as for each steelworks and each office. We discuss the operating and financial performance, safety, health, and production management issues, working conditions such as salaries and bonus payments, balancing of work and personal life, and other issues. Close labor-management communication is also maintained, particularly concerning the actual work cases for which the labor unions received reports from their members. The minutes of these discussions are recorded and shared through the Intranet and other means broadly, from senior management to work union members.

Mechanism of corrective actions

We have clarified whom to contact for consultation on various compliance issues including human rights. This is a part of efforts to establish a group-wide claim handling mechanism that makes it easy for employees and related personnel to ask for consultation, and that enables the Company to understand and identify incidents of discrimination.

Specifically, a Compliance Consultation Room has been established to accept inquiries and reports and give counseling regarding human rights abuses such as harassment, from employees of the Company and Group companies and their families, as well as from employees of business partners. Reports and consultations from various stakeholders are accepted through the Inquiries Form accessible on the website. Regarding the response to these individual incidents, such as internal reports and consultations, we investigate the facts and, if necessary, seek advice from outside parties, including lawyers and outside professional organizations, to protect the privacy of the persons and to ensure that they do not receive unfavorable treatment. We then provide guidance and education to those involved, and strive to appropriately resolve the incidents.

Labor-management discussions

114 times for the entire Company
950 times of directors and officers

Number of union members and unionized rate (March 31, 2021)

28,118

100% unionized

In-house magazines for the entire Company as well as each steelworks and each office are regularly published as a means to send various messages to employees. PR magazines are also published to convey our business and other information outside. Our steelworks and offices also regularly set up a place for dialogue with the nearby residents’ associations to ask for their understanding of our business operations and listen to opinions and requests from them, this is part of what we do to realize better communication with the local community.
### Diversity & Inclusion

#### Basic policy

From the perspective of creating a company where diverse employees are productive, perform at their best, be empowered, and feel proud and fulfilled, we are reinforcing our diversity & inclusion efforts while focusing on the following five areas.

1. Promote female employees’ participation and career advancement
2. Realize work-life balance so as to enable employees with various backgrounds and circumstances to perform at their best
3. Develop health management in order for employees to perform at their best and the reference age of ES
4. Prevent harassment
5. Promote empowerment of the elderly and the disabled

The “Diversity & Inclusion Dept.” has been established as a dedicated unit to promote diversity and inclusion efforts.

#### Status of employees (non-consolidated basis)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of employees</td>
<td>26,078</td>
<td>3,001</td>
<td>29,079</td>
</tr>
<tr>
<td>Number of hires</td>
<td>375</td>
<td>51</td>
<td>428</td>
</tr>
<tr>
<td>Average years of service</td>
<td>16.0</td>
<td>11.0</td>
<td>15.5</td>
</tr>
<tr>
<td>Rate of voluntary termination (FY2021)</td>
<td>2.8%</td>
<td>3.4%</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

#### Promotion of women’s participation and career advancement

**What we have done so far**

We have introduced the following programs: 1) a childcare leave which is more generous than legally required; 2) a program for employees who resign the company after having left it because of childcare or nursing care and other reasons; 3) a leave to assist overseas relocation of a spouse; and 4) a temporary exemption program for employees who have difficulty in relocation because of childcare or nursing care and other reasons. We have also been opening 24-hour childcare centers in steelworks and have introduced maternity work clothes for use by steelwork employees who are in the childbirth/childcare period, in order to help them continue their shift work without feeling concerned. We are thus enhancing programs to support employees’ work-life balance. In addition, we are investing in improving work infrastructure such as showers, toilets, and dressing rooms at manufacturing sites, and improving work practices, so as to establish a comfortable working environment for female employees.

**Toward further promoting women’s participation in the workplace**

Based on the various programs and work environments that we have established, we have developed the following action plan to support female employees to continue to demonstrate their abilities through career development, and to promote their empowerment in all workplaces and levels, including enhancement of promotion to managerial positions.

**Plan of action as a general employer based on the Act on the Promotion of Female Participation and Career Advancement in the Workplace in Japan**

In order to enhance an employment environment where female employees can perform at their best, an active plan is formulated as follows:

**Target 1**

- **Basic details of efforts, and implementation schedule**
  - **Target 1**
    - **Plan**
      - 1) Promotion of teleworking, 2) Elimination of long work hours (for those with constraint on workplace or work time due to childcare or other conditions to continue to work), 3) Career assessments for female employees, and 4) Flexible placement and development.
  - **Implementation schedule**
    - From FY2021
      - 1) Managers to support each employee to take paid leaves as scheduled.
      - 2) Prepare a pamphlet on the vacation and leave program, distribute it to employees, and develop educational activities.
      - Encourage taking paid leave days by setting the labor union some specific days recommended for paid leaves and by conducting a campaign to do so in the summer.
      - Managers to take the initiative in taking off on paid leave days.
      - Managers to support each employee to take paid leave days as scheduled.

**Target 2**

- **Plan**
  - 1) Hire more women.
  - **Implementation schedule**
    - From FY2021
      - Prepare a pamphlet on the vacation and leave program, distribute it to employees, and develop educational activities.
      - Encourage taking paid leave days by setting the labor union some specific days recommended for paid leaves and by conducting a campaign to do so in the summer.
      - Managers to take the initiative in taking off on paid leave days.
      - Managers to support each employee to take paid leave days as scheduled.

**Improved hiring and retention**

The ratio of women in overall hiring is 17%, and we will continue to expand their hiring. We also seek to improve the retention rate of female employees by taking the following measures: 1) promotion of teleworking, 2) elimination of long work hours (for those with constraint on workplace or work time due to childcare or other conditions to continue to work), 3) career assessments for female employees, and 4) Flexible placement and development based on the understanding of individual circumstances. Our other continual efforts include management of long work hours (for those with constraint on workplace or work time due to childcare or other conditions to continue to work), fully planning career advancement, and actively promoting advancement to managerial positions.

**Support for employees’ career development and work-life balance**

In addition to establishing career education programs to contribute to the further promotion of female employees’ performance, we also encourage them to develop their capability by providing opportunities for growth through proactive efforts in anticipation of various life events, and by actively promoting advancement to managerial positions. We will create a workplace culture where work and home life are comfortably balanced by making various programs well known to employees, through improvement and introduction of brochures which explain the programs. We also provide to managers education concerning unconscious bias and diversity management.

With the aim of encouraging male employees with young children to actively participate in childcare, we encourage them to take child-care and related leave.

Through our efforts in promotion of diversity and inclusion, we are committed to creating a company where diverse employees are empowered, and feel proud and fulfilled.
Realizing the work life balance as a means to enable people with diverse situations perform well in the workplace

Restraint on long-work hour

As a precondition for an environment in which diverse human resources can perform at their best, we are committed to reducing long work hours based on appropriate work time management. Prior to the revision of the Labor Standards Act, starting in fiscal 2018, we set up work time capping rules for all employees, including managers, to promote improved work management and work practices that lead to more efficient, higher-value-added output.

We will continue to pursue workstyles that achieve maximum results within a limited amount of time, while incorporating the effects of business reform and DX measures.

Enabling flexible ways of working

All human resources with their diverse attributes and circumstances, such as age, gender, and restrictions on work time and workplace due to childcare and nursing care, ideally should make the most of their finite time available and perform at their best. From this viewpoint, we are expanding our work system to move away from traditionally-set ways of working and pursue more flexible and diverse ways of working in accordance with the nature of work at any given time and fluctuation in workload flow of operation needed at that time, and the circumstances of each individual.

In fiscal 2019, we revised the work-at-home system, which was previously limited to childcare cases, and introduced the teleworking system. Among employees under the flexible time system and those eligible to the short-work hour program for childcare and nursing care, those approved by the Company on the basis of their work assignment can do teleworking. The workplace in this case is not limited to home but any location.

Along with the introduction of the teleworking system, we have also adopted various IT tools to develop the environment that allows employees to work at any place as in the office. This has led to an efficient way of working, using spare time on business trip or out of office, and maximizing the ability of employees with childcare, nursing care, and other circumstances. In response to the COVID-19 pandemic, and since the Japanese Government made initial requests to refrain from going out and declared of the state of emergency, we have used the accumulated knowledge and experience, and have actively utilized the teleworking system.

A flexible time system has also been introduced. Since fiscal 2019, a more flexible management structure has been in place by our expanding the workplaces that could use the “coreless flexible system,” which eliminated the core time — an essential time period to be in the office, so that we can achieve a more harmonious way of working, balanced with personal life.

Based on these systems, we aim to achieve improved productivity and employees’ work-life balance, while pursuing ways in which individuals can perform at their best.

Realization of a flexible way to take time off from work

We have been establishing the employer environment so that it facilitates a flexible way to take time off from work, tailored to the circumstances of individual employees and their life stage.

With regard to annual paid leave, we encourage employees to use it in order to refresh physically and mentally. Each business site has set recommended dates to acquire annual paid leave. The head office, for example, sets every Friday in August as an “Eco-paid leave day,” and recommends that employees not set meetings and other events on those days in order to make it easier to take off those days. The annual leave utilization rate in and before fiscal 2019 exceeded 70%, but declined to about 60% in fiscal 2020 partly due to the effects of the temporary leave utilization rate in and before fiscal 2020.

Among employees under the flexible time system and those eligible to the short-work hour program for childcare and nursing care, those approved by the Company on the basis of their work assignment can do teleworking. The workplace in this case is not limited to home but any location.

Along with the introduction of the teleworking system, we have also adopted various IT tools to develop the environment that allows employees to work at any place as in the office. This has led to an efficient way of working, using spare time on business trip or out of office, and maximizing the ability of employees with childcare, nursing care, and other circumstances. In response to the COVID-19 pandemic, and since the Japanese Government made initial requests to refrain from going out and declared of the state of emergency, we have used the accumulated knowledge and experience, and have actively utilized the teleworking system.

A flexible time system has also been introduced. Since fiscal 2019, a more flexible management structure has been in place by our expanding the workplaces that could use the “coreless flexible system,” which eliminated the core time — an essential time period to be in the office, so that we can achieve a more harmonious way of working, balanced with personal life.

Based on these systems, we aim to achieve improved productivity and employees’ work-life balance, while pursuing ways in which individuals can perform at their best.

We have been establishing the employer environment so that it facilitates a flexible way to take time off from work, tailored to the circumstances of individual employees and their life stage.

With regard to annual paid leave, we encourage employees to use it to get refreshed physically and mentally. Each business site has set recommended dates to acquire annual paid leave. The head office, for example, sets every Friday in August as an “Eco-paid leave day,” and recommends that employees not set meetings and other events on those days in order to make it easier to take off those days. The annual leave utilization rate in and before fiscal 2019 exceeded 70%, but declined to about 60% in fiscal 2020 partly due to the effects of the temporary leave utilization rate in and before fiscal 2020.

Among employees under the flexible time system and those eligible to the short-work hour program for childcare and nursing care, those approved by the Company on the basis of their work assignment can do teleworking. The workplace in this case is not limited to home but any location.

Along with the introduction of the teleworking system, we have also adopted various IT tools to develop the environment that allows employees to work at any place as in the office. This has led to an efficient way of working, using spare time on business trip or out of office, and maximizing the ability of employees with childcare, nursing care, and other circumstances. In response to the COVID-19 pandemic, and since the Japanese Government made initial requests to refrain from going out and declared of the state of emergency, we have used the accumulated knowledge and experience, and have actively utilized the teleworking system.

A flexible time system has also been introduced. Since fiscal 2019, a more flexible management structure has been in place by our expanding the workplaces that could use the “coreless flexible system,” which eliminated the core time — an essential time period to be in the office, so that we can achieve a more harmonious way of working, balanced with personal life.

Based on these systems, we aim to achieve improved productivity and employees’ work-life balance, while pursuing ways in which individuals can perform at their best.

We have been establishing the employer environment so that it facilitates a flexible way to take time off from work, tailored to the circumstances of individual employees and their life stage.

With regard to annual paid leave, we encourage employees to use it to get refreshed physically and mentally. Each business site has set recommended dates to acquire annual paid leave. The head office, for example, sets every Friday in August as an “Eco-paid leave day,” and recommends that employees not set meetings and other events on those days in order to make it easier to take off those days. The annual leave utilization rate in and before fiscal 2019 exceeded 70%, but declined to about 60% in fiscal 2020 partly due to the effects of the temporary leave utilization rate in and before fiscal 2020.

Among employees under the flexible time system and those eligible to the short-work hour program for childcare and nursing care, those approved by the Company on the basis of their work assignment can do teleworking. The workplace in this case is not limited to home but any location.

Along with the introduction of the teleworking system, we have also adopted various IT tools to develop the environment that allows employees to work at any place as in the office. This has led to an efficient way of working, using spare time on business trip or out of office, and maximizing the ability of employees with childcare, nursing care, and other circumstances. In response to the COVID-19 pandemic, and since the Japanese Government made initial requests to refrain from going out and declared of the state of emergency, we have used the accumulated knowledge and experience, and have actively utilized the teleworking system.

A flexible time system has also been introduced. Since fiscal 2019, a more flexible management structure has been in place by our expanding the workplaces that could use the “coreless flexible system,” which eliminated the core time — an essential time period to be in the office, so that we can achieve a more harmonious way of working, balanced with personal life.

Based on these systems, we aim to achieve improved productivity and employees’ work-life balance, while pursuing ways in which individuals can perform at their best.
Diversity & Inclusion

Promoting physical wellness

Cancer disease control
Various cancer screening (excluding non-statutory exams) based on age and gender are incorporated in our health checkups. In particular, regarding exams for gastric and colon cancer, which are high risk diseases, we set the priority targets age and screening frequency accordingly.

<table>
<thead>
<tr>
<th>Type of examination</th>
<th>Priority target (target age and test frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastric cancer screening (gastric fluoroscopy)</td>
<td>Every 2 years, 30 years old or older</td>
</tr>
<tr>
<td>Colon cancer screening (colonoscopy)</td>
<td>Every 2 years, 50 years old or older</td>
</tr>
</tbody>
</table>

For research purposes, we have established a unique company-wide system that enables us to assess and manage the risk of diseases based on the results of health checkups. We provide health guidance according to risk factors or control the frequency of health checkups. It is important that workers with high risk of cardiovascular disease improve their lifestyle. We will improve the implementation rate of specified health guidance, which aims at improving the dietary and exercise habits of workers, by setting a target rate and promoting medical visits. We cooperate with the Health Insurance Union for achieving the goal.

Promoting mental wellness

Aiming for each employee in the Nippon Steel Group to enjoy a robust life and a vibrant company.

We also offer education on how to be aware of one’s own stress and to deal with it, how managers should care for their subordinates and manage their teams, and how to coordinate with the corporate health care professionals (physician, nurses, and other staff). We provide the stress check which is a workplace stress survey every fall. Occupational health care professionals give guidance for improvement by teams and individuals based on the result of the stress check. In contributing to a vigorous work environment, managers implement necessary measures according to the issues of a team or an individual, coordinating with the personnel department and the health department. Because early detection and early response are important in the treatment of mental illness, we identify those who are at risk at the Health Consulting Contact by various measures in association with the Health Consulting Contact by management supervisors.

Support for employees to work overseas

To enable employees who have been assigned to work overseas to be free of undue worries, a seminar for the employees and their family is held before the overseas assignment, and information on mandatory vaccination, the local medical system, and other matters are provided. Under the policy of providing continuous health management support during overseas assignments, interviews with occupational health care professionals are regularly conducted counseling via online and at the time of a temporary return to Japan, in addition to aftercare-checkups of the regular medical exams.

Moreover, one of the Company’s physicians periodically visits overseas offices, researches local medical institutions and the daily-life environment, and meets with the employees who work overseas to offer advice. We have contracted with a medical service company to provide the medical care locally, in preparation for the employees possibly becoming ill overseas. Concerning the COVID-19 infections, necessary infection prevention measures, including occupational health care professionals are regularly implemented in consideration of the local infection situation and the state of medical care, with the first priority on the safety and health of the employees who work overseas and their families.

Health-wellbeing activities

In addition to the above-stated health measures, we collaborate with the Health Insurance Union and labor unions in a variety of health-wellbeing activities, such as the “Health Challenge Campaign” living habits, “Health e-learning” for improving employee health awareness, and passive smoking preventive measures.

Preventing harassment

In order for all Nippon Steel employees to work with vigor, it is extremely important to respond appropriately to harassment issues, and we are strengthening our efforts to prevent them. Specifically, we have clarified our internal policies to prevent harassment in terms of working regulations and internal regulations, and we have also prepared and distributed leaflets to promote awareness among all employees. In addition, we engage in education through e-learning for all officers and employees, and through sponsoring lectures on harassment at milestone training events, spanning activities from new employees to higher management. In addition to continuing these efforts, we will periodically review and improve the contents of our efforts, including the fostering of awareness of unconscious biases as part of our training programs.

Empowerment of the elderly and the disabled

Employment for the elderly

With regard to the promotion of the empowerment of the elderly, we extended the retirement age to 65 from 60 in fiscal 2021, after consultation with labor unions, and taking into account the declining working population, the response to the extended starting age of the pension system, and the maintenance and improvement of our workplaces.

Assuming that the same work will be carried out, even after the age of 60, the employment scheme as well as the salary and bonus scheme will remain the same up to the age of 65.

Under this new system, hopefully, all generations, up to 65 years of age, will continue to perform at their best at the front lines of our workplaces, while also invigorating the skill transfer process and communication within the workplace between generations, thereby creating a vibrant company.

Employment for the disabled

Recognizing employment of the disabled as an important social challenge, we are implementing an action plan for their employment and providing a friendly working environment.

Since 2007, we have established special purpose companies to expand employment opportunities. As of June 2021, at four special subsidiaries of Nippon Steel Group Ltd., over 100 people are actively engaged mainly in various outsourced work from Nippon Steel. The work includes data input and printing of written documents, cleaning of the steelworks premises, cleaning and management of the welfare facilities, and cleaning of work clothes.

Preventive smoking measures and non-smoking compliance

Target implementation rate

|实际实施率 | 34.6% | 目标实施率 | 70% |

Employment rate of the disabled (as of June 2021)

2.35%
Initiatives for Human Resources Development

**Initiatives for human resources development**

**Basic Policy for Human Resource Development**
Nippon Steel’s Management Principles state that “we develop and bring out the best in our people to make our Group rich with energy and enthusiasm,” positioning human resource (HR) development as a top-level concept. A goal of HR development is to create people who can understand and implement our Corporate Philosophy and our Employee Action Guidelines. All our employees keep this in mind.

Nippon Steel’s basic approach to HR development is for supervisors to transfer their subordinates, through daily dialogues on the job, understanding and knowledge of criteria for judgment and of operational skills. In order to share this mind with all employees, the following “Basic Policy for Human Resource Development” has been established.

**Development of operators and maintenance staff**

The operators and maintenance staff need continually put into practice their accumulated skills in stagnation and maintenance, from joining the Company on the assumption of long-term employment to retirement. They thus fundamentally support the Company’s manufacturing worksites. Smooth transmission of technology and skills from veterans to younger workers is essential and a system that facilitates this is needed. Therefore, after identifying, through a supervisor-subordinate dialogue, the skills or skills to be acquired, a skill development plan is developed and carried out. The status of planning and skill transfer is monitored by using a skill map — a list of skills for each individual. If necessary the plan and its implementation are modified.

In light of the ongoing diversification in recruitment sources (especially the increase in female employees and middle-career recruitment) in response to the rapidly declining working-age population in Japan, it is essential to promote the development of infrastructure and the creation of a workplace environment in which diverse personnel can be motivated and collaborate with each other. Specific efforts along these lines include the establishment of an environment and education on human rights and harassment. Off the job training (OJT-JT), which complements the on-the-job training (OJT), is used throughout the Company by organizing the minimum skills and knowledge required by each rank of employees of Nippon Steel into a company-wide standard system. Through this, we work at measures to maintain and improve motivation of the elderly to continue working with health and motivation, and at education of workplace leaders to further increase their ability to add to and improve our knowledge base from the field (“field technology”).

**Development of office staff and engineers**

Following the Basic Policy for HR Development, Nippon Steel uses a “HR Development PDCA” for office staff and engineers, who implement OJT-JT-based HR development plans. Specifically, development plans are formulated for each person based on the corporate philosophy and organizational strategies, and are discussed by supervisors and subordinates. Implementation is routinely checked and, if needed, revised. This PDCA for HR development follows a one-year cycle, from April through March of the following year.

An employee’s period of time from joining the Company to becoming a manager is divided into three steps: “Discipline”, “Creation” and “Independence”. Based on the OJT, work reporting sessions and training by rank are carried out at the milestones of the 2nd, 3rd, or 5th anniversaries of the start of employment.

The aim of achieving world-leading technologies and manufacturing capabilities, basic courses in engineering are taught so that employees can learn the essential technologies needed to systematically acquire the skills required for steelmaking. In particular, the content of courses classified as process-specific technologies is at the core of Nippon Steel’s technology. Most of the lectures on the underlying and advanced technologies are given by our own engineers.

With the aim of achieving world-leading technologies and manufacturing capabilities, basic courses in engineering are taught so that employees can learn the essential technologies needed to systematically acquire the skills required for steelmaking. In particular, the content of courses classified as process-specific technologies is at the core of Nippon Steel’s technology. Most of the lectures on the underlying and advanced technologies are given by our own engineers.

The training courses are provided to managers match the managers’ qualification and position, and are given so that they can acquire proper understanding of their responsibilities and authority as managers, knowledge, skills, and mindset that contribute to enhancing the management as supervisors, and group management capabilities. We gather managers in similar positions to cultivate each other and share experiences and opinions. In recent years, we have given increased attention to management education. We added new courses including one for line manager candidates to enhance line management skills on the manufacturing field, and one for new managers to ensure they have a correct understanding of their roles and responsibilities as managers, and acquire the required knowledge and management skills to conduct business.

Nippon Steel is expanding business to overseas growth markets and many Nippon Steel employees are working on these projects, together with employees of our joint ventures and local employees. At these bases, we also contribute to local communities by locally hiring employees and creating job opportunities.

Nippon Steel also has programs for employees who can contribute to our overseas business expansion. For global Group employees and managers, we have been standardizing English “dialog ability” for each qualification, and a language education system suitable for any level of English has been created for that. Further, for young managers, there are middle-management seminars designed for them to acquire the knowledge, skills, and mindset necessary for domestic and overseas business. For young employees, we offer opportunities to study aboard or work at overseas operational companies for a certain period. We also provide a course for employees who are assigned to work aboard and their family members.

**Development of staff who support technological advancement**

With the aim of achieving world-leading technologies and manufacturing capabilities, basic courses in engineering are taught so that employees can learn the essential technologies needed to systematically acquire the skills required for steelmaking. In particular, the content of courses classified as process-specific technologies is at the core of Nippon Steel’s technology. Most of the lectures on the underlying and advanced technologies are given by our own engineers.

Concerning development of overseas local staff, we also make efforts to transfer to them Nippon Steel’s criteria for judgment and operational skills, mainly through OJT, in line with the Company’s Basic Policy for HR Development. In the ASEAN countries and India, where our overseas Group companies are concentrated, training courses by rank, as well as OJT-JT courses for specific skill learning or for special subjects are conducted.

**Development of staff for roles in overseas expansion**

Nippon Steel is actively expanding business to overseas growth markets and many Nippon Steel employees are working on these projects, together with employees of our joint ventures and local employees. At these bases, we also contribute to local communities by locally hiring employees and creating job opportunities.

Nippon Steel also has programs for employees who can contribute to our overseas business expansion. For global Group employees and managers, we have been standardizing English “dialog ability” for each qualification, and a language education system suitable for any level of English has been created for that. Further, for young managers, there are middle-management seminars designed for them to acquire the knowledge, skills, and mindset necessary for domestic and overseas business. For young employees, we offer opportunities to study aboard or work at overseas operational companies for a certain period. We also provide a course for employees who are assigned to work aboard and their family members.

**Development of employees who can contribute to digital innovation**

We make extensive use of data and digital technologies for production and business process innovation and are promoting a Digital Transformation (DX) strategy combined with implementing measures to speed up decision-making and enhance our problem-solving.

Among our DX activities we have established a skills training program for employees to acquire data science knowledge and enhance

---

Sustainability report 2021 NIPPON STEEL CORPORATION

Social Initiatives

Initiatives for Human Resources Development

Based on the belief that the development of excellent personnel is a prerequisite for the production of excellent products, Nippon Steel is rolling out robust programs to strengthen the overall capabilities of the Company’s human assets.

*Discipline*: In the initial few years, new hires learn the basics in each of our fields of expertise, and acquire the manners and basic patterns for work as a social person through each practice.

*Creation*: The employees in this step are assigned to perform a certain task from start to finish, develop their execution ability, identify their own field of expertise, and acquire a firm basic foothold in it.

*Independence*: Through experience of working according to their own development skills, they acquire leadership skills. Together with development of skills, when they reach this phase they must also pay close attention to the development of their subordinates or junior colleagues.
Supply Chain Management

To realize the production and supply of steel products required for a sustainable society, Nippon Steel is making various efforts concerning the procurement of raw materials, other materials, and equipment as well as the arrangement of systems for stable production, shipping, and transportation, and the offering of solutions to meet customer needs.

Sustainable procurement efforts

Economic development of emerging countries is a major element of change in the global purchasing environment, requiring Nippon Steel to make strategic purchasing for enhancing manufacturing capabilities. At the same time, it is becoming increasingly important for not merely our Company but also our entire supply chain to fulfill social responsibilities in order to realize a sustainable society. Against this background, we steadily and continuously procure raw materials, other materials, and equipment to achieve a stable supply of steel products for a sustainable society.

In terms of procurement of raw materials and fuels, we are sourcing from suppliers worldwide, including Australia, North America, South America, South Africa, and China, for a stable supply of more than 100 million tons of raw materials for the steelworks. The supply of materials is mainly iron ore and coal. In the procurement of materials and equipment, we purchase around one million product items of equipment and materials — from gigantic facilities such as blast furnaces to electric and mechanical products as well as safety, emergency, and office supplies — from about 3,000 suppliers other than major suppliers of iron ore and coal.

In engaging in these procurement activities, we are committed to compliance with laws and regulations, consideration of environmental conservation, elimination of racial discrimination and human rights abuses, confidentiality and thorough information management as prerequisites. We then strive to maintain and improve mutual understanding and trust with suppliers from a long-term perspective. In July 2020, upon affirming agreement with efforts made by the Ministry of Economy, Trade and Industry, we made a declaration for the establishment of partnership relations with suppliers and other business partners to establish cooperative and co-existing relationships.

In connection with procurement of materials and equipment from numerous suppliers, we hold a Material/Equipment Procurement Partners Meeting, to be held once every three years with an objective to share our purchasing policy, in order to deepen dialogue and share procurement policies based on management strategies.

In fiscal 2018, about 1,300 suppliers attended our first Partners Meeting, where we asked them to cooperate in strengthening partnerships to improve manufacturing competitiveness and in promoting procurement activities to achieve the goals of the SDGs. In July 2021, the second Partners Meeting was held.

Efforts to stabilize production

We have a high computational capability that enables advanced image analysis and deep learning, performance of various data analyzers, and development of AI and NE-CHI™, an applicable platform. We also promote safety and operational support by introducing AI, including AI and IoT, implementing preventive measures to stabilize production, and improving the quality.

As part of these efforts, we launched a long-term operational test of the on-line monitoring of facility status, using the AI technology “invariant analysis technology” of NEC Corporation, in January 2021 at the East Nippon Works Kiritama Area. The objective of this test is to build a facility monitoring platform at the steelworks. The introduction of the system enables AI to learn and model operational data to prevent potential problems and to improve efficiency in facility inspection and operation monitoring.

Improve productivity in domestic logistics

Nippon Steel’s backbone of industrial logistics is the use of approximately 200 domestic coastal vessels to transport about 60% of its domestic steel products. The domestic transport sector, similar to other logistics sectors, has a problem of shortage in workforce.

As one of ways to answer the question of how to improve logistics, the Nippon Steel Group is working on improving logistics efficiency by establishing a logistics control center at its head office and utilizing the latest domestic logistics control system. Specifically, we consolidate the information needed for allocation and control of the coasters, such as their location information, progress rate of cargo handling at the steelworks, and the status of inventory at transfer points. We then perform real-time monitoring and operation, thereby improving transportation efficiency. We believe that these efforts will lead to increased productivity and ease of work in domestic industrial logistics as well as in the domestic shipping industry, and will contribute to alleviating the shortage in the workforce.

Solution proposals to meet customer needs

Nippon Steel has been making advancements in the development of solutions for the next-generation steel car concept NiRelay™ AutoConcept (NiAC), which was announced in 2019. In anticipation of the performance required for each component of a next-generation steel car, which must embody substantial weight reduction and improved safety, we have been developing, in NiAC, advanced materials as well as component structures (to maximize material performances) and processing technologies (for these structures). At present, due to CASE, MaaS, and other changes in the automobile environment, various functions have become required for the vehicle body and components. Against this background, Nippon Steel is expanding the application range of NiAC technology for next-generation steel vehicles and is strengthening efforts to create value for customers and society by so doing.

Consideration to reducing environmental impact in procurement activities

Based on the Life Cycle Assessment concept, Nippon Steel is taking initiatives in reducing environmental impact at various points along the supply chain. In keeping with rising demand for tighter management of chemical substances, we have created management standards for 16 toxic chemical substances, keeping with rising demand for tighter management of chemical substances, with businesses, governments, academia, local governments, and NGOs, was founded, in order to promote green purchasing activities. Jointly

In the Green Purchasing Network (GPN) since 1996, when the network was founded, in order to promote green purchasing activities. Jointly with businesses, governments, academia, local governments, and NGOs, we have taken the initiative in developing a framework to prioritize the purchasing of products and services that represent less environmental load.

Optimal management of manufacturing and shipping

In order to deliver products that meet customer requirements on time, our head office unit, which manages all our sales and marketing, coordinates product manufacturing plans throughout the Company every day, while keeping track of sales and production. The process control units in each steelworks receive the plan, and manage the progress of each single product, while keeping in mind the productivity of each manufacturing base. These units seek for optimal processing from manufacturing to shipment, and delivering products as scheduled.

Toxic material management concerning quality assurance

**Together with Local Communities**

**Environment preservation activities, jointly with local communities**

In our Basic Environmental Policy, we are committed to conducting business activities that take into account the perspective of environmental conservation in the community. We are promoting environmental risk management, by means such as detailed responses to different environmental risks at each steelworks, and environmental protection activities in partnership with the local communities.

- **Kajima Coastal clean-up**

In the East Nippon Works Kajima Area, we are conducting coastal cleaning activities in cooperation with Kajima City, Kajima City Tourism Association, Kajima Coast Protection Association, Kajima Junior Chamber, and Kajima City Construction Cooperative Association. Since the start of this activity in 1894, the cleaning area has been gradually expanded. In 2019, approximately 1,300 people participated and collected 6.6 tons of trash. (Due to the COVID-19 pandemic, the activity was suspended in 2020.) This continued activity with residents in the community has received numerous awards. In April 2021, Nippon Steel's East Nippon Works Kajima Area received a Medal with Green Ribbon as an Environmental Beautification Association.

- **Collaboration with an NPO, “Mari wa Umi no Koibito”**

The Tohoku Branch of Nippon Steel is a regular corporate member of the NPO, Mari wa Umi no Koibito (The forest is longing for the sea, the sea is longing for the forest), represented by Mr. Shigenori Hatakeyama, a fisherman raising oysters and scallops in Kesennuma City, Miyagi Prefecture, who received the Forest Hero award from the United Nations. Since 2012 We participated in the NPO’s tree-planting activity at Murone Mountain in Kesennuma Prefecture, which began in 1989, based on the theory that the chain of forests, villages, and the sea nurtures the blessings of the sea. In fiscal 2019, 64 of Nippon Steel’s employees and family members joined the 31st tree-planting activity. In fiscal 2020 and 2021, a tree-planting festival, was canceled due to the COVID-19 outbreak. However, we will continue to participate in such activities in the future.

**Together with government and public institutions Involvement in public policies and legal compliance**

- **Suggestions on public policies, opinions as the industry, and cooperation with government**

Over the years, Nippon Steel has provided personnel to key positions of the Japan Federation of Economic Organizations (Keidanren) and the Japan Iron and Steel Federation (JISF), and through the activities of these organizations, has expressed opinions and urged them to take action on deregulation matters and the implementation of institutional reforms aimed at improving the Japanese economy.

In the local communities, we also strive to cooperate with various organizations such as the local government and the local chamber of commerce and industry.

- Voicing opinions on deregulation and institutional reform aimed at maintaining and improving the vitality of the Japanese economy.
- Participation in public policy studies, such as infrastructure development, adoption of the International Financial Reporting Standards (IFRS), revision of the Corporate Governance Code, tax reform, Digital Transformation (DX), workforce reform and regional revitalization.
- Recommendations on national strategy to achieve a “lifetime cycle of environmental sustainability and economic growth,” the need for policies that will strengthen the international competitiveness of industries, and energy policy.
- Promotion of voluntary initiatives by industry to achieve Japan’s medium- to long-term targets based on the Paris Agreement (Low Carbon Society Action Plan).
- Participation in the JSPF’s formulation of Basic Policies for the Japanese Steel Industry on Carbon Neutral in 2050.

- **Adherence to relevant laws and regulations, and building of an appropriate relationship with government and public institutions**

Based on the Nippon Steel Group’s Corporate Philosophy and Code of Conduct, we have developed company rules and guidelines for the prevention of bribery of domestic and foreign public officials, compliance with anti-monopoly law and environmental regulations, and protection of personal information. We make sure that our officers and employees are aware of and adhere to laws and regulations and other rules.

- **Fair tax payment**

We comply with relevant laws and regulations, and pay tax appropriately in all countries in which we operate. We maintain transparent, constructive communication with tax authorities, eliminate action that could be construed to be for evasion of taxes and bear fair tax burden.

**Initiatives for dialogue enhancement**

To achieve sustained growth and improve corporate value over the medium to long term the Company has adopted the Basic Policy for Information Disclosure and Dialogue with Shareholders and Investors. We strive to proactively provide information and cooperatively respond to questions raised by shareholders at the General Meetings of Shareholders. In addition, we regularly hold corporate briefings and plant tours, and publish interim reports for shareholders to promote shareholders’ understanding and enhance communication with them. (In fiscal 2020, we did not conduct plant tours, to prevent the spread of COVID-19 infections.)

For institutional investors we host briefings on quarterly results and the Medium- to Long-Term Management Plan, visits to steelworks and research centers, and other events, to discuss our strategies, businesses, operating performance, and other issues. Small meetings with investors, various conferences, and visits to overseas institutional investors are other means for enhancing communication.

In fiscal 2020, we held a Carbon Neutral Vision 2050 Briefing and a DX Strategy Briefing.

**Support for educational activities**

- **Support of community-based education**

Nippon Steel has been engaged in unique community-based environmental education support programs and educational activities concerning “Mori wa Umi no Koibito” (The sea is longing for the forest). In 2020, the COVID-19 pandemic made it difficult to host visits to steelworks. We therefore sent lectures from steelworks or branch offices to special occasions in the local communities upon requests of the latter.

In the East Nippon Works Kajima Area, on-line learning sessions were provided as a new undertaking. We also donate to Tohoku University’s endowment and support its activities on behalf of children in the areas affected by the Tohoku Earthquakes and Tsunami of 2011. The fund aims at spreading knowledge on prevention and reduction of damage from natural disasters and developing the ability to judge risks of such disasters.

- **Hosting of plant visits**

In order to understand the steel industry, there is no better way than a visit to a steelworks — seeing steelmaking facilities and how people work there, and talking with them if possible. In fiscal 2019, approximately 130,000 people participated in our plant tours, but in fiscal 2020, the tours were not conducted in order to prevent the spread of COVID-19 infections.

- **Internship programs and the endowment of a university course**

For many years, Nippon Steel has been internship opportunities to students to help them learn our business and gain some work experience. We also endow a university course, which also contributes to one of our business strategies, “enhancement of our technological superiority.”

**Activities in the support of art, music, and sports as social contribution**

- **Activities in the support of music**

Nippon Steel is active in corporate philanthropy activities in the support of music, particularly through the work of the Nippon Steel Arts Foundation. The Foundation manages Kioi Hall in Tokyo, organizing performances of its resident chamber orchestra and promoting Japanese traditional music. We also give the annual Nippon Steel Music Awards, established in 1990, to young classical music performers and to those who have contributed to the development of classical music.

- **Activities in the support of sports as a social contribution**

Nippon Steel manages or supports sports teams in the local communities of its steelworks. These include a judo club, which has produced Olympic medalists; baseball teams, which have sent many of its players to the professional leagues; a football team, a rugby team, and a volleyball team.

All of these teams also contribute to their local community through various activities as: sports classes for children, coaching of junior teams, and making our athletic facilities available to local residents for games and training. Together with local residents who support our teams, we strive to provide renewed vigor to our local communities, and at the same time to support their healthy lifestyle.
Corporate Governance

Nippon Steel has adopted a company structure with an Audit & Supervisory Board since 2020. This is because Nippon Steel strives to speed up management decision-making, enhance discussions on the formulation of management policies and management strategies at the Board of Directors by prioritizing items to be discussed, and strengthen the supervisory function of the Board of Directors, especially as the environment surrounding steelmaking and other businesses are changing more significantly.

Corporate governance structure and internal control system

1. Corporate Governance System

Currently, the Board of Directors of Nippon Steel is comprised of eighteen (18) members, of whom eleven (11) are Directors (excluding Directors who are Audit & Supervisory Committee Members) and seven (7) are Directors who are Audit & Supervisory Committee Members, and is chaired by the Representative Director and President. Outside Directors account for more than one-third (7 out of 18), including one female outside director) of all members of the Company’s Board of Directors.

Of the above, the Directors (excluding Directors who are Audit & Supervisory Committee Members) are comprised of eight (8) Executive Directors who were employees of Nippon Steel with intimate knowledge of Nippon Steel’s businesses, and three (3) Outside Directors who have vast experience in, and deep insights into, such areas as employment, labor, corporate management, international affairs, economies and cultures.

The Directors who are Audit & Supervisory Committee Members are comprised of three (3) Directors who were employees of Nippon Steel with intimate knowledge of Nippon Steel’s businesses, and four (4) Outside Directors who have vast experience in, and deep insights into, such areas as laws, public administration, public finances, corporate accounting and economies.

The executive of important matters concerning the management of Nippon Steel and the Nippon Steel Group is determined at Board of Directors’ meetings (held about once per month) after deliberations in the Corporate Policy Committee (once a week, in principle) comprised of the Representative Director and Chairman, Representative Director and President, Representative Directors and Executive Vice Presidents, and other members, pursuant to Nippon Steel’s rules.

As corporate organizations engaging in deliberations before the Corporate Policy Committee and the Board of Directors, there are 21 company-wide committees in total, including the Risk Management Committee, the Environment Management Committee, the Zero-Carbon Steel Committee, the Ordinary Budget Committee, and the Technology Development Committee, depending on each purpose and each area, as of April 1, 2021.

2. Internal control system

Nippon Steel has established internal control risk management systems, based on autonomous activities by internal divisions and Group companies, according to the Basic Policy on Internal Control System, which was resolved by the Board of Directors, and the Internal Control Basic Rules. The Internal Control & Audit Division coordinates closely with each area’s functional division in charge of risk management, develops annual plans concerning internal control and risk management, prepares schemes for check and review, regularly assesses the status of internal control across the entire Group, and works at continual improvement. As a whistleblower system, an internal consulting contact point was established to receive information not only from employees of Nippon Steel and the Group companies, but also from their families, suppliers, and others. The contact office receives reports and consultation (that may be made anonymously) on a wide range of subjects — from violation of laws, regulations, or company rules to ascertaining of rules thought to be needed for operations. It is also positioned as one of the bodies that monitors the status of internal control activities, in addition to its functions on compliance and optimization of operations, such as to prevent accidents and violations of laws, and to improve operations.

3. Risk management

The Risk Management Committee, chaired by the Executive Vice President in charge of the Internal Control & Audit Division, receives regular reports from the Division on the development and execution status of the internal control annual plan, the compliance status of laws and regulations, and the matters related to risk management, which include adherence to the Conduct Code of Nippon Steel Group Companies and other company rules as well as ESG risks, such as labor safety, workplace sexual or power harassment and other abuse of human rights, environmental issues, disaster prevention, quality assurance, financial reporting, and information security. The Committee then deliberates and checks the status of measures taken. What was deliberated and ascertained by the Risk Management Committee, including important risks, is reported and deliberated by the Corporate Policy Committee, attended by the Representative Director and Chairman and Representative Director and President among other members.

The Board of Directors evaluates effectiveness of supervision of risk management and internal control by receiving regular reports on managerial important risks, including those originated by the Risk Management Committee and the Corporate Policy Committee.

For further information, please refer the Integrated Report 2021 pp. 100-102.

Corporate governance enhancement activities since 2006

- Reduction of the number of directors in the Articles of Incorporation from 84 to 15
- Increase to 20 when Nippon Steel & Sumitomo Metal Corporation were separated into two (2013)
- Adoption of the Executive Management System
- Adoption of a limited liability contract with external auditors
- Appointment of Outside Directors (2014)
- Adoption of a limited liability contract with Outside Directors
- Adoption of a limited liability contract with full-time Audit & Supervisory Board Members
- Establishment of the Nomination and Compensation Advisory Committee
- Increase the number of Outside Directors to three (appointment of a female director)
- Transition to a Company with an Audit & Supervisory Committee

Corporate Governance

Nippon Steel has always pursued world-leading technologies and manufacturing capabilities, and is committed to contributing to the development of society by providing excellent products and services. In accordance with this corporate philosophy, a corporate governance structure appropriate for the Nippon Steel Group’s business has been established in order to ensure the Group’s sound and sustainable growth and to improve its medium- to long-term corporate value in response to the delegation of responsibilities by and trust from all stakeholders, including shareholders and business partners.
Corporate profile (as of March 31, 2021)

Name: Nippon Steel Corporation
Head office: 2-6-1 Marunouchi, Chiyoda-ku, Tokyo 100-8071, Japan
Establishment: April 1, 1950
President: Eiji Hashimoto
Capital: 419,524 million yen (424,454 shareholders)
Stock listings: Tokyo, Nagoya, Fukuoka, Sapporo
Number of employees: 106,226 (consolidated)
Group companies: 389 consolidated subsidiaries, 110 equity-method affiliates

Awards Received in FY2020

<table>
<thead>
<tr>
<th>Award name</th>
<th>Sponsor</th>
<th>Description and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020 Good Design Award</td>
<td>Japan Institute of Design Promotion</td>
<td>New product “FeLuce™” hairline-finished electroplated steel sheet (Nippon Steel)</td>
</tr>
<tr>
<td>2020 Award for Excellence in Corporate Communications and Transportation 2019</td>
<td>Telecommunications Association of Japan</td>
<td>Highly recognized for its effectiveness in promoting the use of advanced communications and transportation technologies.</td>
</tr>
<tr>
<td>Award for World Class TMI Achievement</td>
<td>Japan Institute of Plant Maintenance</td>
<td>Infrastructure built to improve the site’s sustainability and efficiency, leading to a reduction in waste and improvement in the level of management (NS-Siam United Steel Co., Ltd.).</td>
</tr>
<tr>
<td>The 47th Nippon Keiretsu Memorial Award</td>
<td>Nippon Keiretsu Memorial Foundation</td>
<td>Development and commercialization of high-strength steel plate to improve corrosion resistance of crude oil tanker and prevent marine oil spills (Nippon Steel).</td>
</tr>
<tr>
<td>The 54th Industry Prize in Industry for Distinguished Achievement</td>
<td>Libra Foundation for New Technology</td>
<td>Development of ultra-high tensile steel sheet processing technology to support innovation in automobiles (Nippon Steel).</td>
</tr>
<tr>
<td>Namio Top 100 Global Innovator 2020</td>
<td>Reuters Analytics (USA)</td>
<td>Awarded as one of the world’s most innovative companies by analyzing the trend in intellectual property and patents (Nippon Steel).</td>
</tr>
<tr>
<td>2020 NEXT Minister’s Award “Prize for Science and Technology Development Division”</td>
<td>Ministry of Education, Culture, Sports, Science and Technology (METI)</td>
<td>Development of novel materials for ultra-high tensile steel cables to reduce environmental impact (Nippon Steel).</td>
</tr>
<tr>
<td>Equipment Supplier of the Year</td>
<td>Royal Dutch Shell Group</td>
<td>Made the most significant contribution to Shell’s development and production target, and helped advance Shell’s goal of virtually zero greenhouse gas emissions by 2035 (Nippon Steel, Sumitomo Corporation).</td>
</tr>
</tbody>
</table>

Nippon Steel Corporation has been selected as a constituent both of the FTSE4Good Index Series and the FTSE Blossom Japan Index, well-renowned ESG investment indices four years in a row. These indices are widely used as important criteria by investors worldwide, who increasingly focus on ESG initiatives of companies.

Contact
Nippon Steel Corporation
Contact: Environment Division
Tel.: +81-3-6867-2566, Fax.: +81-3-6867-4999
Dr. go to the “Contact Us” page of Nippon Steel’s website (https://www.nipponsteel.com/en/contact)