Editorial policy
This Sustainability Report is the 23rd since the former Nippon Steel Corporation issued what is the first sustainability report by a Japanese steel manufacturer, in 1998. In April 2020, we absorbed Nippon Steel Nisshin and restructured and reestablished our organization and governance system. Our commitment to promote business activities that contribute to the realization of a sustainable society remains unchanged and we continue to carry out diverse initiatives.

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 form the basis for supporting our sustainable growth, in detail, by adding representative examples. Please use the link to the relevant website URL on each page to see more details.

Period covered
The period covered in the report is FY2019 (from April 2019 to March 2020). For some activities, the period from April 2020 to June 2020 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 2020 of Nippon Steel (issued in October 2020) 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

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

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

Towards the Realization of a Sustainable Society (SDGs)

Eiji Hashimoto
Representative Director and President

I would like to thank our shareholders and all other stakeholders for your understanding and support to the Nippon Steel Group.

Our Group’s mainstay steelmaking business is expected to remain in an extremely harsh business environment partly due to the COVID-19 crisis, which has further aggravated the unprecedented environment of “Higher raw material prices and lower steel product prices.” Despite being in such situation or because of this, we find it important that we aim at “becoming the best steelmaker with world-leading capabilities” and contributing to the realization of a sustainable society. For that purpose, we focus on early transition to an optimal production framework in Japan, enhancement of globally-competitive strategic products in quality and quantity, and execution of initiatives to deepen our overseas business in response to the global trend of “local production and local consumption” and “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. We have addressed the SDG issues by four ways: 1) Eco Process (drastic reduction in CO2 emitted in steelmaking process); 2) Eco Solutions (transfer and dissemination of our environmental technologies to emerging countries); 3) Eco Products (demonstration of energy-efficiency performance as final products by developing and supplying high-function steel materials); and 4) Innovative technology development (considering zero-carbon steel forward ahead). We believe that each of these initiatives can be an effective response to risks as well as creation of new business opportunities. In May 2019 we signed a statement of support for the Task Force on Climate-related Financial Disclosures (TCFD). In this Sustainability Report, we have identified these risks and new business opportunities, considered their importance, and determined their impact on Nippon Steel as well as strategies. The proceeding of this scenario analysis has led us to develop some new business strategies. As an example, we decided to newly construct manufacturing facilities for ultra-high-tensile steel sheets and electrical steel sheet, in order to respond to potential growth in their demand and rising needs for higher efficiency for vehicles. We will continue to contribute to the global environment through various business activities, which include provision of outstanding products and technologies in Japan and abroad, in addition to reduction of environmental impact associated with steel production.

To further advance toward realizing an ambitious vision on decarbonization, we began examining our CO2 reduction scenarios that had set goals for 2030 and 2050. We intend to announce specific scenarios and strategies within the current fiscal year. We have also registered many innovation projects for Japan Kiekenren’s “Challenge Zero” initiative, based on the notion that a virtuous cycle of the environment and growth can be created from non-consecutive innovations. A representative project among them is a challenge of hydrogen reduction steelmaking. This was adopted as a national project and Japan’s public-private cooperative project is just about kicking off. As a core company carrying out activities for the project, we will also take up the challenge of developing hydrogen reduction steelmaking technology, which enables zero CO2 emission in steelmaking.

Recently a “circular economy” has become a concept which is attracting increasing interest from the perspective of promoting economic growth while building a sustainable society. Steel is a material from which can be easily recycled and which can be endlessly recycled without causing deterioration in quality. Steel can be described as a perfect embodiment of a circular economy. Nippon Steel is also actively engaged in use of by-product generated in steelmaking for achieving zero emission and a 100% recycling of plastic containers and packaging generated in society. We are committed to contributing in the realization of a circular economy with further technological innovation.

Concerning maintenance and improvement of the living environment, we will focus on environmental risk management, including prevention of accidents and undesirable conditions or events. This is our priority issue for continuing business, along with safety and disaster prevention. In addition to compliance with laws and regulations, we strictly adhere to the ordinances and standards of municipalities, and give due consideration to the condition of each base of operations, thoroughly taking measures from both hard and soft aspects to reduce environmental burden. Concerning biodiversity preservation, we have been actively engaged in environmental preservation activities in various regions, including the creation of hometown forests by our steelworks. The forests have grown to total around 830ha. In light of the scheduled adoption of the post-2020 Arab Biodiversity Targets, we formally expressed our support to Kiekenren’s Declaration of Biodiversity and Action Policy and developed and disclosed our initiative policy. As initiatives to establish a society co-existing with nature are both regional and global issues, we intend to incorporate them in our business activities and to execute the environmentally integrated management, with the aim of realizing a sustainable society.

Social initiatives
We declare in our Corporate Philosophy to pursue world-leading technologies and manufacturing capabilities, and contribute to society by providing excellent products and services. This resonates with the concept of the United Nations’ Sustainable Development Goals (SDGs). Our Eco Products initiatives can be regarded as representative examples. We are eager to continue to preannal as a company that helps solve diverse social issues through its business activities.

We are engaged in activities on behalf of safety, respect of human rights, promotion of diversity, social contribution via support of arts, culture, and sports, and community-based educational support, in addition to the maintenance and improvement of the communities’ living environment, as a part of efforts to earn the trust of all of our stakeholders. Some of these activities are presented in this report. Notably, we began a teamwork program in fiscal 2019 as a part of Worklife Innovation. I am pleased that this program is already working effectively during the current COVID-19 crisis. 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
For the company’s sound and sustainable growth, and improvement of its corporate value in the mid- to long-term, we had established a corporate governance structure appropriate for our operation as a Company with a Board of Company Auditors but made a transition to a Company with an Audit & Supervisory Committee in June 2020. By enhancing the supervisory function to the management and accelerating decision-making, we are appropriately responding to a widened fluctuation in business environment conditions and an accelerated pace of change.

ESG initiatives are considered as one of our priority management issues, which form the base that supports sustainable corporate growth. We have recently made a step forward and have identified our materiality with due consideration to our corporate priority, stakeholders’ expectation, and our growth strategy. Going forward, we intend to steadily promote its execution and follow-up by checking Key Performance Indicators to assess outcomes.

In this Sustainability Report, we have expressed our strong commitment to ESG initiatives to achieve sustainable growth and to contribute to realizing a sustainable society. We hope that you take a look of this report and let us know your feedback.

Environmental initiatives
Having positioned environmental matters as priority issues that underlie in our corporate management 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 earth, including climate change issues, creation of a circular economy, and maintenance and enhancement of a favorable living environment.

In this Sustainability Report 2020 we are pleased to present our wide-ranging initiatives in regard to the Environment, Social, and Governance (ESG) issues we face together, toward realizing a sustainable society.

Having positioned environmental matters as priority issues that underlie in our corporate management 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 earth, including climate change issues, creation of a circular economy, and maintenance and enhancement of a favorable living environment.

In this Sustainability Report 2020 we are pleased to present our wide-ranging initiatives in regard to the Environment, Social, and Governance (ESG) issues we face together, toward realizing a sustainable society.

Environmental initiatives
Having positioned environmental matters as priority issues that underlie in our corporate management 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 earth, including climate change issues, creation of a circular economy, and maintenance and enhancement of a favorable living environment.

In this Sustainability Report 2020 we are pleased to present our wide-ranging initiatives in regard to the Environment, Social, and Governance (ESG) issues we face together, toward realizing a sustainable society.

Environmental initiatives
Having positioned environmental matters as priority issues that underlie in our corporate management 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 earth, including climate change issues, creation of a circular economy, and maintenance and enhancement of a favorable living environment.

In this Sustainability Report 2020 we are pleased to present our wide-ranging initiatives in regard to the Environment, Social, and Governance (ESG) issues we face together, toward realizing a sustainable society.

Environmental initiatives
Having positioned environmental matters as priority issues that underlie in our corporate management 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 earth, including climate change issues, creation of a circular economy, and maintenance and enhancement of a favorable living environment.

In this Sustainability Report 2020 we are pleased to present our wide-ranging initiatives in regard to the Environment, Social, and Governance (ESG) issues we face together, toward realizing a sustainable society.
## Attractiveness of Steel

Steel is one of the most familiar materials of which things are made and is indispensable for our daily lives. Thanks to its diverse properties and infinite potential, steel can be recycled endlessly, contributing to reduction in environmental impact and to a sustainable society.

### 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, has a wide range of applications.

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

Steel can be easily sorted out from among other metals and materials, and degrades little when recycled. Steel is an optimal material that can be recyclable many times, as the most outstanding material for the infrastructure of society, a material that supports people’s lives and overall economic development.

Steel does not end its life even after the end of a life of a product made of steel. It becomes steel scrap to be recycled back to the steelmaking process, and is reused as a new product.

### Diverse properties and a wide range of applications

Due to diverse advantages such as strength and easiness 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 represents 90% or more of metal materials, and degrades little when recycled. Steel is an optimal material that can be recyclable many times, as the most outstanding material for the infrastructure of society, a material that supports people’s lives and overall economic development.

Steel is for here for all of us now and will be with us in the future.

### Infinite potential

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

Steel can also be described as a natural composite material to be adjusted for specific uses by controlling the level of carbon content. This also imparts diverse properties to it.

In addition to adjusting carbon and other content, steel’s properties can be advanced by controlling the combination of its temperature and rolling at the manufacturing stage. The greater the understanding of the nature of different kinds of steel, the greater is its potential and real value.

### Comparison of CO₂ emissions in manufacturing for same vehicle component

<table>
<thead>
<tr>
<th>Components manufactured</th>
<th>Conventional steel materials</th>
<th>High-tensile steel</th>
<th>Aluminum</th>
<th>Carbon fiber reinforced plastics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional equivalent weight</td>
<td>230</td>
<td>173</td>
<td>67</td>
<td>40</td>
</tr>
<tr>
<td>CO₂ emissions per unit weight (kg)</td>
<td>2.3</td>
<td>2.3</td>
<td>16.5</td>
<td>22.0</td>
</tr>
</tbody>
</table>

While some materials are lighter than steel, steel has an extremely lower environmental impact in manufacturing.

## Steel is an outstanding material from the perspective of the Life Cycle Assessment

The Life Cycle Assessment method (LCA) is a way 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 disposal and recycling of the end product. From the LCA perspective, steel can be regarded as a sustainable material with very low environmental impact relative to other materials.

### Let’s consider the overall life cycle

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

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

Focusing only on the steelmaking process itself, 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 scrap steel 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, environmental impact of the BF and EAF routes in total terms are the same over the life cycle of steel.

This approach is recognized in the ISO 20915 and the JS G 20915. As an example, the amount of CO₂ emission in making 1kg of hot-rolled steel is about 2kg in the BF route and 0.5kg in the EAF route. However, incorporating the recycling effect, the total amount of CO₂ emission is about 0.7kg for both the BF steel and EAF steel.

Thinking in terms of the whole life cycle (LCA) of a product is extremely important in considering environmental impact. This approach is becoming widely accepted in the global steel industry.
In order to accurately anticipate and adapt to the changes of the times and respond to the needs of customers, the Nippon Steel Group has strived to advance steelmaking technology and provide new products to society. We are determined to contribute to development of society while further enhancing our advanced technology.

### Steel supported high economic growth

- **1960s**
  - Construction of Integrated seaside steelworks
  - Introduction of converters
  - Introduction of continuous casting machines
  - Began production of oriented electrical steel sheets

- **1970s**
  - Development of Top Pressure Recovery Turbine (TPR)
  - Installation of active coke dry type desulfurization equipment
  - Development of the Tokaido Shinkansen Line

- **1980s**
  - Development of in-line annealing furnaces
  - Start of blowing of fine powdery coal to the blast furnace
  - Began production and sales of corrosion resistance, lightweight, and high-strength titanium.

- **1990s**
  - Developed lead-free bars and wire rods with ensured workability.

- **2000s**
  - Developed regenerative burners
  - Developed HAREST steel that is resistant to cracking at the time of collision of a ship in order to prevent oil leakage and pollution of the ocean.

- **2010s**
  - Developed HRX19TM stainless steel, enabling high-pressure hydrogen to be used for hydrogen stations and fuel cell vehicles.

### Energy saving challenge

- **1960s**
  - Began production of oriented electrical steel sheets which is used in transmission/distribution transformers and reduces their energy loss.

- **1970s**
  - Developed and began production of high-strength cables, contributing to the construction of the Akashi Kaikyo (Strait) Bridge and other long bridges.

- **1980s**
  - Developed steel wires for high-strength cables, contributing to the construction of the Akashi Kaikyo (Strait) Bridge and other long bridges.

- **1990s**
  - Developed CLEANWELLTM DRY1, an eco-friendly top pressure recovery system that can collect CO2 contained in the stack gas from blast furnaces or thermal power stations.

- **2000s**
  - Developed HRX19TM stainless steel, enabling high-pressure hydrogen to be used for hydrogen stations and fuel cell vehicles.

### Respond to the yen’s sharp appreciation

- **1960s**
  - Top Pressure Recovery Turbine (TPR)

- **1970s**
  - Development of in-line annealing furnaces

- **1980s**
  - Installation of active coke dry type desulfurization equipment

- **1990s**
  - Developed regenerative burners

### Support in the era of concern for the global environment

- **1990s**
  - Developed regenerative burners

- **2000s**
  - Developed HRX19TM stainless steel

### Support for customer’s global expansion

- **2010s**
  - Developed HRX19TM stainless steel

### Toward becoming the world-leading steelmaker with comprehensive strengths

- **2010s**
  - Expanded usage of biomass resources, such as used wood pallets, forested forest wood, and other resources even including coffee grounds, as coal alternative fuel for power generation.

- **2010s**
  - Expanded usage of biomass resources, such as used wood pallets, forested forest wood, and other resources even including coffee grounds, as coal alternative fuel for power generation.

- **2010s**
  - Developed HRX19TM stainless steel, enabling high-pressure hydrogen to be used for hydrogen stations and fuel cell vehicles.

- **2010s**
  - Completed construction of the first commercial mod- el of an energy-efficient CO2 separation and recovery facility for a non-steelmaking area, at Muroran Works. CO2 contained in the stack gas from blast furnaces or thermal power stations is separated and collected for use as a chemical absorption solution.

- **2010s**
  - Concluded a verification test of an experimental blast furnace of the COURIESO project, aimed at reducing CO2 emission by hydrogen reduction.

- **2010s**
  - Ten H-shaped steel products, including the Mega H Hyper BeamTM, acquired the EcoLeaf Environmental Label for the first time.
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, Setouchi and Kyushu — and R&D activities in three centers in Futsu, Hasaki, and Amagasaki.

Overseas Manufacturing Bases
The Nippon Steel Group’s overseas business is expanding to the extent of having a global supply network of 37 million tons in steel processing capacity, mainly for use of automobiles, resources and energy, infrastructure, electric appliances, containers, and others.

Sales composition by region
Japan 65% Overseas 35%

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
¥215.7 bn
Nippon Steel Chemical & Material Co., Ltd.

This segment strives to develop demand for functional products for electronics materials, such as display materials, epoxy resins, circuit board materials and organic EL materials, in addition to needle-like, diverse aromatic products, and other diverse carbon-related original products. Based on materials expertise gained from steelmaking, this segment provides original materials and components that are indispensable to leading-edge technology fields, with primary focus on the three areas — semiconductors and electronics, industrial basics, and environmental and energy areas.

Engineering and construction business
¥340.4 bn
Nippon Steel Engineering Co., Ltd.

Based on long-accumulated steelmaking and other technologies, Nippon Steel Engineering undertakes many projects worldwide in six fields: steelmaking plants; environment; energy; offshore steel structures; building construction and steel structures; and pipelines.

System solutions business
¥273.2 bn
NS Solutions Corporation

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

Steelmaking and steel fabrication business
¥5,257.3 bn
Nippon Steel Corporation

Enhancing technological superiority, Nippon Steel provides a variety of high-grade steel products (e.g., 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.

Introduction
Nippon Steel's ESG Materiality
Environmental Initiatives
Social Initiatives
Corporate Governance

Nippon Steel's ESG Materiality

Environmental Initiatives

Social Initiatives

Corporate Governance

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of employees</th>
<th>Crude steel production volume (non-consolidated)</th>
<th>Ordinary profit/Business profit (consolidated basis)</th>
<th>Net sales/Revenue (consolidated basis)</th>
<th>Net income/Profit attributable to owners of the parent (consolidated basis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>92,006</td>
<td>93,027</td>
<td>265.5</td>
<td>15,920</td>
<td>135.2</td>
</tr>
<tr>
<td>Overseas</td>
<td>92,006</td>
<td>93,027</td>
<td>265.5</td>
<td>15,920</td>
<td>135.2</td>
</tr>
</tbody>
</table>
Value Creation Process and Nippon Steel’s Strengths

BUSINESS MODEL

INPUTS

Manufactured capital
Global steel production capacity
90 mn tons/year

Tangible fixed assets (book value)
¥2.8 tn/year

Natural capital
Iron ore
57.77 mn tons/year (FY2019 imports)

Coking coal
26.24 mn tons/year (FY2019 imports)

Industrial water (Makeup water)
700 mn m^3 (FY2019 makeup volume)

Intellectual capital
R&D staff (non-consol.)
900

R&D expenses
¥77.6 bn

Patents (non-consol.)
Japan 15,000
Overseas 21,000

Human capital
Number of employees (consol.)
196,599

Number of employees (non-consol.)
27,096

Financial capital
Equity attributable to owners of the parent
¥2.6 tn

Interest-bearing debt
¥2.5 tn

D/E ratio
0.74

Social and relationship capital
• Coexistence with communities
• Relationship of trust and cooperation with customers

BUSINESS ACTIVITIES

Domestic mother mills as sources of technological strength
• Operational and facility technologies long accumulated based on the model of large blast furnaces and seaside integrated steel mills
• High-grade steel product technologies in response to customers’ sophisticated needs

Global production framework
• Leveraging the strength developed in mother mills in Japan, the global production framework supports Japanese customers’ overseas expansion and respond to overseas growing demand

Synergies between the steelmaking and three other segments

OUTPUTS

Diverse steel products for and solution proposals for various applications

<table>
<thead>
<tr>
<th>Material</th>
<th>Design</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel products</td>
<td>Construction materials</td>
<td>Plastics</td>
</tr>
<tr>
<td>Bars &amp; wire rods</td>
<td>Pipes &amp; tubes</td>
<td>Titanium</td>
</tr>
<tr>
<td>Steelmaking &amp; Machinery parts</td>
<td>Stainless steel</td>
<td>Vehicles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ships</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electric appliances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Containers</td>
</tr>
</tbody>
</table>

ECO PRODUCTS
What we produce is “eco-friendly”

ECO SOLUTION
Sharing our “eco-solutions”

Products using by-products
Steel slag products, coal chemical products

Non-steel business products and services
Environment and energy; urban infrastructure, steelmaking plant, chemicals, functional materials, composite materials; IT consulting; DV promotion; IT outsourcing; modernization

Steel slag products, coal chemical products

Economic value creation
Enhancement of sustainable corporate value and return of profit
• Securing of sustainable profit
• Return of profit
• Investment for further growth
• Corporate value enhancement

OUTCOMES

Contribution to SDGs in society
• Jobs for employees (incl. subcontractors) and growth in community
• Safe, reliable living (street for key sites, parks, railways, bridges, buildings, etc.)
• Energy preservation, climate action, People-oriented society
• Disaster prevention and reduction, National Resilience
• Infrastructure to build in emerging countries and to rebuild in developed countries
• Products and technological solutions in growth areas
• Education for employees and communities

Nippon Steel’s Strengths

Toward becoming the world-leading steelmaker with comprehensive strengths

1. Technology
Products and solutions that contribute to customers’ value creation
• A global steelmaker’s top-level R&D resources
• Practical use of advanced technologies by R&D Centers and Steelworks R&D divisions
• Joint development based on long-term relationships of trust with customers
• A wide variety of products
• Stable mass production technology of high-grade steel
• Synergy with non-steel business segments

2. Cost
Cost competitiveness, enabled by our process technology and operational
• The world’s top-class energy efficiency
• The Top Runner method with multiple steelworks
• Large blast furnace operational technologies

3. Being global
Global expansion in response to Japanese customers’ overseas expansion and local demand
• Global production framework
• Alliances with the world’s major steelmakers
• A presence in growing Asia
• High domestic shares; No.3 in the world in production volume

The Nippon Steel Group creates value by long-term stable provision of diverse products and solutions through its business activities that harmonize with stakeholders and the natural environment in its mother mills in Japan, which are a source of its development and technological prowess, and its overseas manufacturing bases, which support Japanese customers’ overseas expansion and respond to local customer demand. The Group thereby contributes to industrial and social development.
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. on 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 water, and recycling of by-products and waste generated in and out of the company.

The Nippon Steel Group is committed to SDGs through continually supplying steel, a basic element supporting society, in various parts of the world by using its world-leading manufacturing capability.
Nippon Steel's ESG Materiality

Nippon Steel recognizes that ESG initiatives are one of the priority issues and form the basis that supports the very existence and growth of the company. Among these initiatives we have identified our materiality in due consideration of requests from stakeholders, the corporate philosophy and values, as well as growth strategy. We express our ESG materiality in and out of the company, steadily promote its execution and follow-up by checking the Key Performance Indicators (KPIs) to assess outcome, and strive 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 KPIs</th>
<th>Key Performance Indicators (KPIs)</th>
<th>Major Initiatives and Achievements in FY2019</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Safety, environment, and disaster prevention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Safety and health</td>
<td>Excellent frequency rate of 0.12 or less</td>
<td>- Prevention and risk reduction of accidents, based on safety risk evaluation</td>
<td>p. 44</td>
</tr>
<tr>
<td></td>
<td>Zero fatal accidents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Environment</td>
<td>Continuous and consistent emission reduction and environmental conservation</td>
<td>- Implementation of &quot;Eco Process&quot;</td>
<td>p. 24</td>
</tr>
<tr>
<td></td>
<td>Promotion of energy conservation and improvements in energy efficiency</td>
<td>- Promotion of business management and operational reforms to enhance safety</td>
<td>p. 46</td>
</tr>
<tr>
<td></td>
<td>Prevention of environmental incidents</td>
<td>- Improvement of accident prevention systems</td>
<td>p. 25</td>
</tr>
<tr>
<td></td>
<td>Implementation of &quot;Eco Process&quot;</td>
<td>- Promotion of efforts to enhance environmental and safety management systems</td>
<td>p. 47</td>
</tr>
<tr>
<td></td>
<td>- Monitoring of environmental and safety incidents</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Implementation of &quot;Eco Process&quot;</td>
<td>- Adoption of high efficiency in the environmental and safety management system</td>
<td>p. 50</td>
</tr>
<tr>
<td></td>
<td>- Promotion of energy conservation and improvements in energy efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Prevention of environmental incidents</td>
<td>- Adoption of eco-friendly technology</td>
<td>p. 51</td>
</tr>
<tr>
<td></td>
<td>- Promotion of environmental management systems</td>
<td>- Promotion of efforts to enhance environmental and safety management systems</td>
<td>p. 52</td>
</tr>
<tr>
<td></td>
<td>- Implementation of &quot;Eco Process&quot;</td>
<td>- Prevention of accidents</td>
<td>p. 53</td>
</tr>
<tr>
<td></td>
<td>- Prevention of environmental incidents</td>
<td>- Adoption of high efficiency in the environmental and safety management system</td>
<td>p. 54</td>
</tr>
<tr>
<td>(3) Disaster prevention</td>
<td>Elimination of disaster risks and group-wide sharing of effective measures</td>
<td>- Prevention of accidents</td>
<td>p. 55</td>
</tr>
<tr>
<td></td>
<td>Zero serious disaster-related accident</td>
<td>- Adoption of high efficiency in the environmental and safety management system</td>
<td>p. 56</td>
</tr>
</tbody>
</table>

Step 1: Consider requests from stakeholders on environmental, social issues and listing candidate issues

Step 2: Generalize the issues in due consideration of the company's corporate philosophy and values

Step 3: Verify the issues from the viewpoint of the company's value creation process and strategy

Step 4: Discuss and approve issues in the meeting of the Board of Directors

Introduction
Nippon Steel's ESG Materiality
Environmental Initiatives
Social Initiatives
Corporate Governance

NIPPON STEEL CORPORATION Sustainability Report 2020
Integrated Report
Fact Book
Nippon Steel is a corporation whose business activities exert a large influence on the environment. This is borne out by the fact that we consume approximately 5% of the total energy used throughout Japan. For this reason, we see comprehensive “environmental management” throughout the group companies as an integral part of our mission. We are dedicated to managing the company so as to reduce and minimize impact on the environment at all stages, from technological development work to the purchase of raw materials and equipment, manufacturing processes, transportation of products, and onward to their use, recycling and disposal.

**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.

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

**Three ecos and innovative technology development to contribute to SDGs**

Nippon Steel is promoting environmental management centered around four pillars of the three ecos and the company’s innovative technology development, as stipulated in the Basic Environmental Policy. We have developed the 2020 Mid-Term Environmental Management Plan for the three years from FY2018 and have been working on responses to diverse environmental challenges in five main areas. We believe promotion of these initiatives also contributes to achieving Sustainable Development Goals (SDGs). Going forward, from the perspective of SDGs, we will keep identifying and working on issues for which we can contribute through our business.

**2020 Mid-Term Environmental Management Plan**

Under the Basic Environmental Policy, we have developed a mid-term environmental management plan for three years from FY2018 to FY2020 and are tackling many environmental challenges accordingly.

**Environmental management system**

- Enhance the environmental administrative system (i.e., environmental audits, plant audits)
- Conduct environmental management in coordination with group companies
- Promote standardization in manufacturing
- Promote environmental education for employees (i.e., improved environmental education tools)

**Creation of a recycling-based society**

- Expand effective use of in-house generated resources; promote zero emission
- Promote recycling of outside waste (waste plastics and waste tires)

**Environmental relationship activities**

- Communicate actively with stakeholders on environmental issues
- Appropriate, timely disclosure of environmental information, so as to be continuously trusted by society
- Secure bio-diversity and work for harmony with nature
- Provide opportunities to study the environment to people outside the company (i.e., sending lecturers)

**Measures against climate change problems**

- Promote the Initiatives for Achieving a Low Carbon Society
- Promote next-generation technology development
- Promote international alliances based on the policies and activities of the Japan Iron and Steel Federation
- Consider to set up long-term targets

**Environmental risk management**

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

**Three ecos and innovative technology development**

**ECO PROCESS** The way we manufacture is “eco-friendly”

Nippon Steel uses world-leading resources and world-leading energy efficiency to manufacture steel products and aims to develop eco-friendly steelmaking processes by further improving efficiency.

**ECO SOLUTION** Sharing our “eco-solutions”

We contribute to the reduction of CO2 emissions and other environmental impact on a global scale by diffusing our Group’s world-class environmental and energy-saving technologies in Japan and overseas.

**Innovative Technology Development**

Based on the objective of offering society technologies and products that contribute to the saving of resources and energy and the reduction in environmental impact, we are developing innovative advanced technologies from a medium- to long-term perspective.
Promotion and Enhancement of Environmental Management

Nippon Steel has built an environmental management system that includes not only its own steelworks and factories, but also its group companies in Japan and abroad. Activities to reduce environmental risks are promoted by combining internal and external audits and following the plan-do-check-act (PDCA) cycle.

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 developed a procedure 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 meet-ings and environmental group leader meetings, with participation by all steelworks, are regularly held. In particular, Nippon Steel works to reduce risks related to sedimented dust, wastewater, and waste including activi-ties. 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 cli-mate change, as it involves significant risks in the longer term.

Environmental management system

Nippon Steel has built an environmental management system that includes not only its own steelworks and factories, each plant, each group company, and overseas companies. This system consists of the Environmental Management Committee in charge of overall environmental management, the Steelworks Environmental Management Committee, the Environmental Management Committee for Group Companies, and the Environmental Management Committee for Overseas Group Companies. The Environmental Management Committee consists of four Executive Vice President in charge of Corporate Planning, General Administration, Legal, Harassment Resources, Environment, Technical Administration & Planning, Plant Engineering and Facility Management, Energy Technology, Research and Development, and Global Business; one Managing Director; one Managing Executive Officer; Head of Corporate Planning Division; Head of Legal Division; Head of Accounting & Finance Division; Head of R&D Laboratories; Head of Technical Administration & Planning Division; and Head of Environment Division.

Annual environmental management cycle

- Environmental Management Committee
  - Drawing up of an annual policy
  - Environmental Group Leaders Meeting
- Environmental Management Committee for Group Companies
  - Environmental Conference
  - Environmental Management Committee for Overseas Group Companies
  - Environmental Management Committee
  - Drawing up of a half-year action plan
  - Review of environmental risk management activities by each steelworks and each group company
  - Management of group companies

Environmental audits

In accordance with the international standard ISO 14001, Nippon Steel has built an environmental management system, with each steelworks 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 Environmental 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 (94 companies subject to environmental review) including those overseas, a direct interview is conducted by a member of the Head Office Environmental Department to improve management levels. This is part of the corporate governance conducted by the Head Office Internal Control/Audit Department.

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 energy conservation by installing environmental-friendly equipment such as dust collectors and improving the efficiency of production equipment. Costs of environmental preservation are quantified by adding the costs of capital investment associated with environmental measures, energy-saving measures, and recycling measures to expenses incurred to preserve the environment. We track capital expenditures for environmental, energy-saving, and recycling measures as well as expenses incurred to preserve the environment, as environmental preservation costs.

Environmental preservation costs

For FY2019, capital expenditures for environmental preservation amounted to 13.9 billion yen in total, or approximately 5% of the company's capital expenditures. Investment in equipment for environmental measures of 11.7 billion yen include preventive measures for dust emissions, visible smoke emitted from steelworks stacks, extreme water discharge from drain outlets, and leakage of water from the retentions and quay walls.

Environmental conference participated in by group companies

From the group companies in Japan, Nippon Steel has identified 59 companies (as of April 2020) 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 factors

- Air
  - Dust concentrations at steelworks
  - Emissions of hazardous substances
- Water
  - Discharge of industrial waste water
  - Emissions of hazardous substances
- Waste
  - Waste from operations (including landfilling)
- Emission of greenhouse gases
- Energy use
  - Energy consumption
- Social activity costs
  - Expenses required for creating green areas
- Environmental conference participated in by group companies
  - Expenses required for group companies
  - Expenses required for overseas group companies
  - Expenses required for overseas group companies

Environmental preservation costs

For FY2019, capital expenditures for environmental preservation amounted to 13.9 billion yen in total, or approximately 5% of the company's capital expenditures. Investment in equipment for environmental measures of 11.7 billion yen include preventive measures for dust emissions, visible smoke emitted from steelworks stacks, extreme water discharge from drain outlets, and leakage of water from the retentions and quay walls. Investment in energy-saving equipment of 2.2 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 99.6 billion yen, including 46.9 billion yen in air pollution prevention costs, 14.6 billion yen in water pollution prevention costs, 3.0 billion yen in energy-saving measures, and 11.5 billion yen in environmental R&D costs. Expenses for waste disposal were reduced by promoting in-house recycling.

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 22, water consumption volume, on page 38; and various resources spent, on page 20. For atmospheric substances, SOx and NOx emissions are shown, for water quality and soil, individual performance indicators are used; for hazardous chemical substances, actual reduction volume of substances such as dioxins, benzene, and VOCs are stated; and for waste products, reduction in final disposal volume is stated.

Environmental costs

- Capital investment expenditures: 11.5 Total (¥ billion)
  - Total (¥ billion)
  - Total (¥ billion)
  - Total (¥ billion)
  - Total (¥ billion)
- Social activity costs: 4.6 Total (¥ billion)
  - Total (¥ billion)
- Research and Development Costs: 5.8 Total (¥ billion)
  - Total (¥ billion)
- Other Environmental Costs: — 4.6 Total (¥ billion)
  - Total (¥ billion)

Environmental conference participated in by group companies

From the group companies in Japan, Nippon Steel has identified 59 companies (as of April 2020) 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.
Energy Material Balance

Nippon Steel uses as 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.  

p. 38

2. 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.

3. Use of exhaust heat
Exhaust heat generated in the blast furnaces, incineration facilities, coke ovens, converters, and other facilities, is recovered and used in steam generation and power generation.

4. Generation of electricity
Nippon Steel itself generates 89% of the electricity it uses at steelworks, 81% of which is from internally generated energy sources such as exhaust heat and by-product gases. As much as 37% of the generated electricity is provided to local communities via electric power companies.

p. 37

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 contribute to conservation of resources and energy.

6. Recycling of waste plastics
Nippon Steel recycles 100% of plastic containers and packaging used and collected from households, using a coke oven and a chemical recycling method. We are in alliance with local governments across Japan and handle about 200,000 tons per year, equivalent to roughly 30% of waste plastics collected all over Japan.

p. 37
Coping with Climate Change

Nippon Steel recognizes climate change as a priority problem that threatens survival of the human race. Active climate change will severely affect our business environment and earnings. In order to make our operation sustainable, we strive to curb impacts of climate change by promoting energy conservation, CO2 emission reduction, and improvement in energy efficiency throughout the entire supply chain, from manufacturing to transportation, and at the stage of final use of products.

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 steel-making process (i.e., power generation from recovered 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; conversion to regenerative burners in reheating furnaces. As a result of these concerted efforts, the Nippon Steel Group consumed 1,098 petajoules (PJ) of energy in fiscal 2019, down about 13% vs. the volume in fiscal 1990. CO2 emissions intensely increased from the previous year to 2.06 t-CO2/ton in fiscal 2019 as production output declined partly due to COVID-19; however, CO2 emission dropped by about 12% relative to fiscal 1990 to 84 tons (preliminary) (1).

As a core member of the Japan Iron and Steel Federation (JSIF), we are actively involved in the JSIF’s Action Plans for a Low-Carbon Society by promoting our “three eco” and further CO2 emission reduction.

Nippon Steel Group’s energy consumption budget

<table>
<thead>
<tr>
<th>Year</th>
<th>Energy consumption (PJ)</th>
<th>Energy consumption per ton of crude steel (right scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>1,380</td>
<td>2.56</td>
</tr>
<tr>
<td>2000</td>
<td>1,310</td>
<td>2.48</td>
</tr>
<tr>
<td>2010</td>
<td>1,120</td>
<td>2.34</td>
</tr>
<tr>
<td>2015</td>
<td>1,080</td>
<td>2.26</td>
</tr>
<tr>
<td>2020</td>
<td>1,060</td>
<td>2.24</td>
</tr>
</tbody>
</table>

(1) Energy consumption (left scale)
(2) Energy consumption per ton of crude steel (right scale)
(3) [Calculation method]
Based on the Agency for Natural Resources and Energy “Table of heat generation and carbon emissions coefficient by energy source” (Revision January 31, 2021)
(4) Boundary of data collection
Nippon Steel’s CO2 data (Nippon Steel Corporation, Nippon Steel & Sumitomo Metal, Nippon Steel & Sumitomo Metal, Nippon Steel Co., Ltd., and Toal Steel & Special Steel, Nippon Steel Co., Ltd.)
(5) Modal shift rate: Modal shift means replacing a means of transport from trucks to trains and ships.
The modal shift rate, according to the definition by the Ministry of Land, Infrastructure, Transport, and Tourism, is a ratio of volume transported by trains and marine transportation (including ferries) in long-distance transport over 50km.
(6) CCS: Carbon Capture and Storage
Prepared by Nippon Steel based on the JISF’s Long-Term Vision for Climate Change Mitigation

Contribution with eco-friendly products (Eco Products)

Nippon Steel has expertise in high-function steel products that help customers save energy when using final products made of materials supplied by Nippon Steel. Eco Products are numerous and include high-tensile steel and electromagnetic steel sheets. Making these high-function products emit a little more in CO2 but use of these materials contributes to significantly higher emission reduction when used in final products.

Japanese industry’s energy-saving technologies are spreading globally, contributing to worldwide CO2 emission reduction. In particular, Nippon Steel Engineering in our Group has transformed its Coile Dry Quenching (CDQ) facilities, which had the result of reducing CO2 emission in FY2018 by 20.74 million tons.

Promotion of innovative technology development

Nippon Steel’s R&D divisions are engaged in R&D aimed at CO2 emission reduction and decarbonizing their top-down projects. As a core member of the JSIF, we also participate in the COURSE50 project — “Environmentally HarmORIZED Steelmaking Project Technology Development” — which aims at reducing CO2 emissions from a blast furnace by converting a part of reduction by carbon in the furnace to reduction by hydrogen. Moreover, we are taking up the challenge of developing hydrogen reduction steelmaking technology, which enables zero CO2 emission during steelmaking: we are doing so by participating in the public-private cooperation project for technology development to realize zero-carbon steel.

We are also actively engaged in development of technologies to fix and utilize CO2 such as by converting recycled CO2 to use as raw materials of plastics or fuels, and to extend sea forest development that uses slag and further develop Blue Carbon technology that is effective in absorbing CO2. Many of these R&D divisions toward a decarbonized society are registered in “Challenge Zero,” an initiative of the Nippon Keidanren (Japan Business Federation).

Setting of individual companies’ goals on CO2 emission reduction

Among the prevailing awareness on the climate change issues worldwide, Nippon Steel has established a “Zero Carbon Steel Committee,” attended by all five Executive Vice Presidents. The committee began discussion on subjects, such as individual companies’ scenarios (targets for CO2 emission reduction). We plan to disclose individual companies’ specific scenarios within the current fiscal year.

Adaptation to climate change

In addition to taking mitigation actions against climate change, Nippon Steel is making initiatives to prepare and adapt to potential impacts of such change. We have many products that are used for a long time as construction material for embankments and other public infrastructure. They contribute to providing solutions for “National Resilience,” such as protecting towns from flooding or high tides caused by heavy rains or typhoons. Adaptation to climate changes also leads to business opportunities for Nippon Steel. In various steelworks in Japan and overseas, water storage tanks have been installed and an administration office is built on a pilot structure, which allows to create an open space with no walls on the lowest floor and makes the building less vulnerable to tsunami. This is a part of efforts of Nippon Steel to be well prepared for emergencies such as flooding and high waters.

Work to achieve CO2 emission reduction by raising efficiency in logistics

Nippon Steel maintains a high modal shift rate of 96.6%, improves transportation efficiency by using large vessels (changing from 700-ton vessels to 1,500-ton vessels) in domestic coastal transport and taking other measures, and improve fuel economy by introducing energy-saving tires, lightweight vehicles, etc. As a new measure, we introduced “Usashima” - a hybrid-type cargo vessel, equipped with lithium-ion batteries. The Usashima was awarded the Small Cargo Vessel Award and contributed to reduce CO2 emission.

Logistics sector’s ton-kilometer achievements for FY2019

<table>
<thead>
<tr>
<th>Mode</th>
<th>Total</th>
<th>Improvement in 2019/2018</th>
<th>Improvement in 2018/2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck and trailer</td>
<td>1,255</td>
<td>1,233 (98%)</td>
<td>1,202 (99%)</td>
</tr>
<tr>
<td>Railway</td>
<td>1,000</td>
<td>1,250 (100%)</td>
<td>1,250 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>2,255</td>
<td>2,483 (100%)</td>
<td>2,452 (100%)</td>
</tr>
</tbody>
</table>

(1) Modal shift rate: Modal shift means replacing a means of transport from trucks to trains and ships.
(2) Modal shift rates, according to the definition by the Ministry of Land, Infrastructure, Transport, and Tourism, is a ratio of volume transported by trains and marine transportation (including ferries) in long-distance transport over 50km.
(3) CCS: Carbon Capture and Storage
Prepared by Nippon Steel based on the JISF’s Long-Term Vision for Climate Change Mitigation
Coping with Climate Change

**CO₂ emissions in the value chain**

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

<table>
<thead>
<tr>
<th>Category</th>
<th>CO₂ emissions (thousand tons CO₂)</th>
<th>Calculation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Purchased goods and services</td>
<td>13,853</td>
</tr>
<tr>
<td>2</td>
<td>Fuel (petroleum)</td>
<td>1,656</td>
</tr>
<tr>
<td>3</td>
<td>Heat and energy-related activities not included in Scope 1 or 2</td>
<td>326</td>
</tr>
<tr>
<td>4</td>
<td>Transportation and delivery (including transportation situation reported in the Energy Saving Law document)</td>
<td>680</td>
</tr>
<tr>
<td>5</td>
<td>Waste generated in subsidiaries</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Business travel</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Employee commuting</td>
<td>1.3</td>
</tr>
<tr>
<td>15</td>
<td>Waste disposal</td>
<td>1,719</td>
</tr>
</tbody>
</table>

**Other initiatives (use of by-products and waste in CO₂ reduction)**

- **Blue carbon initiatives**
- **Waste plastics**

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 absorption and fixation in the marine ecosystem), which is getting more attention as a global warming measure. We started to collect basic data on how much CO₂ can be fixed by using steel slag and creating shallow beds, tidal beds, and seaweed beds. A massive amount of data collection is required as there are many research challenges concerning the evaluation method of carbon fixation capacity in the blue carbon ecosystem, including understanding of the biomass amount, the ratio of the amount to be fixed for a long time without being dissolved, and the dynamic of carbon in the complicated coastal ecosystem. Those challenges stem from the fact that types of species and geographical differences substantially vary in the marine ecosystem.

Nippon Steel’s approach is to use our own large water tank (sea laboratory), collect potential data of carbon fixation by type of species (i.e., kelp seaweed bed, sargassum bed, and eelgrass bed) and by area, and establish an evaluation method. By doing so, we can launch a large-scale experimental project aimed at social implementation of blue carbon. Such is how we intend to contribute to creation of a blue carbon system with the sea area utilization technology that uses steel slag.

Our initiatives to improve the marine environment by use of steel slag is expected to be effective as a climate change measure that fixes CO₂, in addition to contribute to the preservation of biodiversity and the protection of the beauty of the sea.

**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

**Scenario analysis**

- **Medium- to long-term growth in global steel demand is projected from 1.62 billion tons in 2015 to 2.69 billion tons in 2050,** 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. In contrast, as generation of end-of-life scrap increases in proportion to an increase in steel stock, use of scrap will increase in steelmaking (from 0.56 billion tons in 2015 to 1.55 billion tons in 2050). This increase is not enough to satisfy the entire steel demand. It is therefore indispensable to make steel from natural resources. Pig iron production in the blast furnace route is also expected to increase from 1.22 billion tons in 2015 to 1.40 billion tons in 2050.

- **As companies are increasingly required to respond to climate change 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 non-steel lightweight materials prompted by tightened environmental regulations); and (3) adoption of carbon pricing that leads to an increase in operating cost.

- **If we identify our potential risks and opportunities driven by climate change and considering their significance to our current business strategies, we** analyzed two scenarios (2°C scenario and 4°C scenario) for a long-term span to 2050, while referring to the transition scenario of the International Energy Agency (IEA), so as to utilize them for designing future business strategies.

**Blue Carbon Initiatives**
## Scenario analysis

### 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 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 EVs is expected to increase demand for non-oriented electrical steel sheets for motors of hybrid vehicles and promote development of higher-grade ones.

Due to such demand growth potential, we have decided to devote capital spending for electrical steel sheets in the Kyushu Works Yatsuna Area (approx. ¥46 billion investment, as announced on August 1, 2019) and the Suzuki Works Hidaka Area (approx. ¥14 billion investment, as announced on November 1, 2019).

Facing automakers’ request for even higher efficiency in motors, so as to lengthen vehicle operation distance, we target the material development efforts to reduce CO2 loss by 10% compared to the current electrical steel steels by 2025.

### 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 to broadly encourage judgments using LCA. We are also taking up the challenge of making lighter steel products. As an example, for vehicles, in addition to development of advanced high-strength steel sheets, we have created the “NSafe™ AutoConcept,” which combines solution technologies (core technology and product portfolio, which contributes to national resilience, and has made investment, as announced on November 1, 2019).

### Physical factor 3
**Heightened need for solutions for “National Resiliency” 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 has recently 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 technology and products in measures against tsunami and earthquake-resistant legislation, as well as repair and reinforcement of agricultural and civil engineering facilities (i.e., water use facilities and reservoirs).

---

**Note:**

1. Source for EV-related data: IEA KR2019
2. The ratio of use of the EAF route is calculated from the estimated crude steel production in the JISF’s paper “A challenge towards zero-carbon steel.”

---

### TCFD scenario analysis

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Event</th>
<th>Transition factor</th>
<th>Impact on demand for steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical factor 1</td>
<td>Suspension of operation by raw material suppliers, due to abnormal weather</td>
<td>Limited impact by taking measures in case of suspending operation by raw material suppliers</td>
<td>Limited impact by taking measures in case of suspending operation by raw material suppliers</td>
</tr>
<tr>
<td>Physical factor 2</td>
<td>Difficulty in operation and shipment, due to abnormal weather</td>
<td>Limited impact by taking appropriate measures</td>
<td>Limited impact by taking appropriate measures</td>
</tr>
<tr>
<td>Physical factor 3</td>
<td>Natural disaster caused by abnormal weather</td>
<td>Limited impact by taking appropriate measures</td>
<td>Limited impact by taking appropriate measures</td>
</tr>
</tbody>
</table>

---

### Physical factor 3

<table>
<thead>
<tr>
<th>Physical Factors</th>
<th>Heightened need for solutions for “National Resilience” against natural disasters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storms and typhoons</td>
<td>- Construction with no waste soil, and high pull-out strength</td>
</tr>
<tr>
<td>Earthquakes and tsunami</td>
<td>- Steel-slit dams</td>
</tr>
<tr>
<td>NPS ECO-PILE™ method</td>
<td>- Steel-slit dams</td>
</tr>
<tr>
<td>Construction with no waste soil, and high pull-out strength</td>
<td>- Steel-slit dams</td>
</tr>
</tbody>
</table>

---

### Graphical representation

**Left:** Bicycles
**Middle:** Plug-in electric vehicles
**Right:** Fuel cell vehicles

Prepared by Nippon Steel based on the IEA “Energy Technology Perspectives 2017” / Internal Consultation Estimate
Coping with Climate Change

ECO PROCESS (The way we manufacture is “eco-friendly”)

Nippon Steel is committed to reduction of the environmental impact created by production activities and manufacturing processes. We make continuous efforts in all processes to not waste limited resources and energy.

Recycling rate of by-product gas

<table>
<thead>
<tr>
<th>Rate of use</th>
<th>Rate of use of in-house generated energy</th>
<th>Supply of electricity to local communities</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>83%</td>
<td>37%</td>
</tr>
</tbody>
</table>

All by-product gases generated in the steelworks are used as in-house energy source.

As its raw materials for steel production, Nippon Steel uses iron ore mined overseas, coal as for reduction of iron ore, and scrap generated by society. 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.

In addition, Nippon Steel itself generates 89% of the electricity it uses at steelworks, 81% of which is from internally generated energy sources such as waste heat and by-product gases. By not wasting but utilizing energy generated within the steelworks, we do our part to reduce CO2 emissions.

We are also engaged in the recycling of various types of by-products generated by society or other industries by utilizing our steelmaking processes that are carried out at high temperature and high pressure. In recent years, we have been actively recycling waste plastics and other waste materials. Reuse of these waste, which are traditionally landfilled or incinerated, as raw materials or energy in steelmaking processing is another way that we reduce CO2 emissions.

Energy inputs

Nippon Steel supplies 37% of internally-generated electricity to the local community.

<table>
<thead>
<tr>
<th>Energy input</th>
<th>Electricity consumed within the Nippon Steel Group</th>
<th>Electricity supplied to the local community</th>
</tr>
</thead>
<tbody>
<tr>
<td>89%</td>
<td>63%</td>
<td></td>
</tr>
</tbody>
</table>

Nippon Steel internally generates 89% of the electricity it uses.

Blow furnaces are huge reactors, using coal

In the blow furnace, a chemical reaction called reduction, which removes oxygen from iron oxides, occurs, and the carbon in the coke functions as a reducing agent. Coal is not burned as a fuel but rather is the ingredient used to cause a chemical reaction.

We are engaged in R&D activities aimed at using hydrogen as a reducing agent partially replacing coal.

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.

High-strength steel sheets for automobiles

Achieving both the strength and the formability, high-tensile, easy-to-form steel sheets contribute to vehicle body weight reduction and higher fuel performance as well as assurance of safety of the driver and passengers at the time of collision of a vehicle. We aim at developing and commercializing even higher-strength steel sheets.

Ultra-high-tensile wires with low environmental impact

By using its proprietary process, Nippon Steel developed wire rod for bridge cable that is global top-class in strength (2,000MPa class) in order to respond to requirements for customers in bridge construction. By eliminating need for lead for this wire, consumption of resources during manufacturing is reduced.

Macro view: No. 2 blast furnace

Mega NS Hyper Beam™

A new product, Mega NS Hyper Beam™, has about 25% greater web thickness than conventional H-shaped steel products. Together with Nippon Steel’s other conventional H-shaped steel products, the Mega NS Hyper Beam™ has acquired the Ecological Environmental Label, an international certification program that discloses the quantitative environmental information related to LCA of products.

HRX19™ stainless steel for high-pressure hydrogen environments

HRX19™ is the world’s highest-grade hydrogen embrittlement properties, and has 60% higher strength than conventional materials. It also can be welded. It is an advanced material that is safe, compact, and has a long product life, besides satisfying requirements for a hydrogen station.

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 or stranding, thereby contributing to preservation of the marine environment. It has been ad-opted for large-sized bulk carriers and ULCCs (Ultra Large Crude Carriers).

HRX19™ stainless steel for high-pressure hydrogen environments

HRX19™ has the world’s top-level hydrogen embrittlement properties, and has 60% higher strength than conventional materials. It also can be welded. It is an advanced material that is safe, compact, and has a long product life, besides satisfying requirements for a hydrogen station.
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.

**Contribute to reduction of CO2 emission on a worldwide scale**

Japan’s steel industry, including Nippon Steel, plays a leading role in the Global Sectoral Approach (GSA), a worldwide initiative to preserve the environment and conserve energy based on technologies accumulated in the steelmaking industry. 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 where there is potential to improve energy efficiency. The reduction effects of CO2 emission by transfer of Japanese steelmakers’ energy-saving technologies have amounted to 65.53 million ton reduction in CO2 emissions per year in total. This is equivalent to about one-third of CO2 emissions of Japan’s entire steel industry.

**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.

**The three pillars of international cooperation in energy conservation**

1. **Joint meetings of public and private steel-related parties**

In the bilateral meetings of public and private steel-related parties of an emerging country and JISF, information, ideas, and comments on various conditions of the country and Japan are shared. Based on the results of preparation of the list of technologies and on the assessment of steelworks, activities have been undertaken to facilitate transfer of Japan’s energy-efficient technologies to the country at an early stage. The JISF also provides detailed technical information and financial aspects of steelmaking. By FY2019, joint meetings have been held 9 times in India and 12 times in six ASEAN countries.

2. **The technologies customized list**

The technologies customized list is a list of energy-efficient technologies, which are identified as appropriate for the target country or region, and the provided information included a technology outline and supplier information. This list was prepared for the purpose of promoting Japan’s energy-efficient technology transfer and is used as reference in doing assessment of steelworks. In FY2018, the technologies customized list was updated for the fourth version for India and into the third version for the ASEAN countries.

3. **Assessment of steelworks**

In the assessment of steelworks, specifically regarding their energy-saving status, experts in this field in Japan’s steel industry visit the foreign steelworks in order to make proposals on technology based on the list and to give advice on operational improvement according to the utilization status of facilities. The experts also analyze the status of energy usage by using an international standard, ISO 4404, which specifies calculation methods for the CO2 intensity of steelworks. Up to FY2019, JISF has conducted assessment of 12 steelworks in India and 14 steelworks in six ASEAN countries.

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

<table>
<thead>
<tr>
<th>Country</th>
<th>CDQ Units</th>
<th>TR Units</th>
<th>TRT Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>106</td>
<td>64</td>
<td>264</td>
</tr>
<tr>
<td>South Korea</td>
<td>32</td>
<td>43</td>
<td>162</td>
</tr>
<tr>
<td>India</td>
<td>27</td>
<td>16</td>
<td>116</td>
</tr>
<tr>
<td>Indonesia</td>
<td>12</td>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Brazil</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>UK</td>
<td>50</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Germany</td>
<td>100</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>South Africa</td>
<td>31</td>
<td>12</td>
<td>42</td>
</tr>
<tr>
<td>Netherlands</td>
<td>23</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Poland</td>
<td>7</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>China</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Russia</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>France</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>USA</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Brazil</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>South Africa</td>
<td>31</td>
<td>12</td>
<td>42</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>China</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Russia</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Germany</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>South Korea</td>
<td>32</td>
<td>43</td>
<td>162</td>
</tr>
<tr>
<td>India</td>
<td>27</td>
<td>16</td>
<td>116</td>
</tr>
<tr>
<td>Indonesia</td>
<td>12</td>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Brazil</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>UK</td>
<td>50</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Germany</td>
<td>100</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>South Africa</td>
<td>31</td>
<td>12</td>
<td>42</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>CDQ Units</th>
<th>TR Units</th>
<th>TRT Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>106</td>
<td>64</td>
<td>264</td>
</tr>
<tr>
<td>South Korea</td>
<td>32</td>
<td>43</td>
<td>162</td>
</tr>
<tr>
<td>India</td>
<td>27</td>
<td>16</td>
<td>116</td>
</tr>
<tr>
<td>Indonesia</td>
<td>12</td>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Brazil</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>UK</td>
<td>50</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Germany</td>
<td>100</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>South Africa</td>
<td>31</td>
<td>12</td>
<td>42</td>
</tr>
<tr>
<td>China</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Russia</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>France</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>USA</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Brazil</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>South Africa</td>
<td>31</td>
<td>12</td>
<td>42</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>China</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Russia</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Germany</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>South Korea</td>
<td>32</td>
<td>43</td>
<td>162</td>
</tr>
<tr>
<td>India</td>
<td>27</td>
<td>16</td>
<td>116</td>
</tr>
<tr>
<td>Indonesia</td>
<td>12</td>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Brazil</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>UK</td>
<td>50</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Germany</td>
<td>100</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>South Africa</td>
<td>31</td>
<td>12</td>
<td>42</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>CDQ Units</th>
<th>TR Units</th>
<th>TRT Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>106</td>
<td>64</td>
<td>264</td>
</tr>
<tr>
<td>South Korea</td>
<td>32</td>
<td>43</td>
<td>162</td>
</tr>
<tr>
<td>India</td>
<td>27</td>
<td>16</td>
<td>116</td>
</tr>
<tr>
<td>Indonesia</td>
<td>12</td>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Brazil</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>UK</td>
<td>50</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Germany</td>
<td>100</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>South Africa</td>
<td>31</td>
<td>12</td>
<td>42</td>
</tr>
<tr>
<td>China</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Russia</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>France</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>USA</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Brazil</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>South Africa</td>
<td>31</td>
<td>12</td>
<td>42</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>China</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Russia</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>Germany</td>
<td>106</td>
<td>25</td>
<td>131</td>
</tr>
<tr>
<td>South Korea</td>
<td>32</td>
<td>43</td>
<td>162</td>
</tr>
<tr>
<td>India</td>
<td>27</td>
<td>16</td>
<td>116</td>
</tr>
<tr>
<td>Indonesia</td>
<td>12</td>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
</tbody>
</table>

**Energy efficiency in steelmaking by country (2016)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Energy Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>100</td>
</tr>
<tr>
<td>South Korea</td>
<td>103</td>
</tr>
<tr>
<td>Germany</td>
<td>105</td>
</tr>
<tr>
<td>China</td>
<td>116</td>
</tr>
<tr>
<td>India</td>
<td>117</td>
</tr>
<tr>
<td>Russia</td>
<td>122</td>
</tr>
<tr>
<td>France</td>
<td>128</td>
</tr>
<tr>
<td>Brazil</td>
<td>129</td>
</tr>
<tr>
<td>UK</td>
<td>130</td>
</tr>
</tbody>
</table>

**Coke Dry Quenching (CDQ): system and features**

Hot coke made in the coke oven is transported in a bucket to the CDQ equipment where it is injected from its top part down to the chamber. The coke is quenched with inert gas, while the hot gas (approx. 950°C) from the exhaust heat is collected, and transferred to the boiler where it generates steam for power generation. The hot gas can be fully recycled by being quenched and circulated back to the chamber. By not using water as a cooling medium, the CDQ method raises the strength of the coke and contributes to stable operation of the blast furnace, an increase in tapping quantity, and reduction in consumption of the reducing agent.
Coping with Climate Change

Innovative Technology Development

Since the 1970s, Nippon Steel has been striving for energy saving and reduction of CO2 emission. At present, we are developing innovative technology that will enable us to make zero-carbon steel by 2100. This effort has the four aspects of 1) reducing CO2 emission, 2) separating and recovering CO2, 3) recycling CO2, and 4) storing CO2.

- Coke Dry Quenching (CDQ) for large-scale waste heat recovery
  Hot coke made in the coke oven is quenched with inert gas, and the heat is used to generate steam for power generation. Compared to wet quenching, 40% energy saving has been achieved. The first CDQ unit was installed in the Kyushu Works Yawata Area in 1976.

- Development of blast furnace mathematical modeling
  We properly adjust gas flow, solid flow, and liquid flow, burden distribution, and other basic factors in blast furnace route with the result that we have reduced the ratio of coke and other reducing agents, and this has reduced CO2 emissions.

- Next generation coke oven Scope21
  We developed the next-generation coke oven that uses an advanced coke-making technology, including prior rapid heat treatment of coal, and enabled significant energy saving. The first commercial models started operation in the Kyushu Works Oita Area in 2008 and the Nagoya Works in 2013.

- Burden distribution three-dimensional DEM model
  Distribution of charged materials from the top of a blast furnace is precisely shown by using a three-dimensional discrete element method (DEM) model, with the aim of arranging the burden distribution that enhances reaction efficiency, which leads to reduction in CO2 emission.

- CO2 separation and recovery
  Commercializing ESCAP® (Energy Saving CO2 Absorption Process)
  This technology for recovering CO2 by using a particular liquid is used as the first step in CO2 recycling, with the world’s top-class performance. Two units are currently in commercial operation in Muroran City and Niihama City.

Research on producing raw materials for plastics from CO2

Technology to synthesize a carbonate ester (shown as DMC, or dimethyl carbonate in the figure below) from CO2 and alcohol. Polycarbonates and other compounds are made from carbonate ester.

Research on producing basic chemical compounds and fuel from CO2

Technology to make basic chemical compound and fuel from CO2 by using a new catalytic technology. This is to realize a process that does not use fossil fuel as raw material.

Research on producing raw materials for plastics from CO2

Technology to synthesize a carbonate ester (shown as DMC, or dimethyl carbonate in the figure below) from CO2 and alcohol. Polycarbonates and other compounds are made from carbonate ester.

From “Creation of Sea Forests” to “Blue Carbon”

Technology to remediate the sea by increasing the growth of seaweed, which absorbs CO2. Steel slag is used to create a rich ecosystem, which contributes to development of fisheries.

- Contribution to expanded absorption of CO2 in farmland
  Fertilizers made with inclusion of steel slag promote growth of agricultural products and help sequester CO2 in farmland.

Carbon fixation

In the figure below, we can see the following:
- CO2 is converted to uracil by photosynthesis in the presence of sunlight and water.
- Calcia modified soil is used to enhance the process.
- Carbon fixation in farmland
  By introducing Calcia modified soil, we are making it possible to remediate the sea and increase the growth of seaweed.

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 12m3 experimental blast furnace of the Kitakyushu Area of the East Nippon Works and we are also undertaking 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.

Project for the “Development of Zero-Carbon Steel Technologies”3

— hydrogen reduction steelmaking technologies

With the aim of achieving net-zero emission in steelmaking process, we are taking up a challenge of developing hydrogen reduction steelmaking technologies that replace coal with hydrogen as reducing agent. This was adopted as a national project and we are getting engaged in this public-private cooperative project.

A new hydrogen production process, which contributes to reduction in CO2 emissions

By developing a proprietary high-performance photocatalyst material, we aim at hydrogen production with zero emission through use of solar energy.

Development of blast furnace mathematical modeling

We properly adjust gas flow, solid flow, and liquid flow, burden distribution, and other basic factors in blast furnace route with the result that we have reduced the ratio of coke and other reducing agents, and this has reduced CO2 emissions.

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

2050

Toward development of a hydrogen reduction steelmaking process that takes blast furnace production into a new phase

- CO2 emission reduction
- CO2 recycling
- CO2 separation and recovery
- Carbon fixation
Innovative technology development for “Challenge Zero”

We recognize the urgent need to tackle climate change issues, the importance of boldly taking up the challenge for innovation toward realizing a decarbonized society, and the significant role that Nippon Steel plays as a major innovator. We therefore stated our agreement with the Challenge Zero declaration, announced by Keidanren in June 2020. Through this, we disclosed the following 10 specific challenges.

Nippon Steel’s ten challenges

<table>
<thead>
<tr>
<th>Name of challenge</th>
<th>Type of innovation</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieving zero emissions in the hydrogen reduction steelmaking process</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
<tr>
<td>Development of CO2 emission reduction technology that uses hydrogen in blast furnace reduction smelting</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
<tr>
<td>Development of chemical absorption method technology that realizes separation and collection of CO2 at low cost</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
<tr>
<td>Contributing to hydrogen infrastructure establishment via diffusion of FFo2TM for hydrogen sidestream</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
<tr>
<td>Development and diffusion of Eco Products that help reduce CO2 emissions when these products are used (NsafeTM-AutoConcept, electric steel slab)</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
<tr>
<td>Improved efficiency in recycling of waste plastics</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
<tr>
<td>Establishing a manufacturing method of dimethyl carbonate (DMC) from CO2</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
<tr>
<td>Zero-emission hydrogen manufacturing technology via artificial photosynthesis</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
<tr>
<td>CO2 fixation by Blue Carbon, which uses steel slag</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
<tr>
<td>Promotion of “Material Resilience” solution toward adapting to climate change</td>
<td>Net-zero emission technology</td>
<td>p. 27</td>
</tr>
</tbody>
</table>

Examples of Nippon Steel’s taken-up challenges

Achieving zero emission in the hydrogen reduction steelmaking process

Roughly 70% of CO2 emission in the steelmaking industry are generated in the blast furnace pig iron making process (reduction reaction to remove oxygen from iron oxides to make steel). As the thermodynamic efficiency of Japan’s blast furnace technology has improved close to a theoretical value, further reduction in CO2 emission is extremely difficult. That is why we are taking up the challenge in hydrogen reduction steelmaking process, in which hydrogen is used for reduction of iron ore, replacing coal as a reducing agent. Strengths in insights and element technology for hydrogen reduction steelmaking, which have been accumulated in the COURSE50 project since 2008, are our strength in this challenge.

As hydrogen reduction reaction of iron ore is endothermic reaction, what we need at this stage is to establish technologies to supply heat to a reaction furnace from outside and to stably supply a massive amount of hydrogen gas to a reaction furnace with due consideration to hydrogen’s combustion characteristics. Moreover, hydrogen is carbon-free but its stable supply at low cost in massive volume is an important requirement. We must therefore cooperate with the government and other companies.

Nippon Steel, JFE Steel, Kobe Steel and the Japan Research and Development Center for Metals (JRCM), all being members of the Japan Iron and Steel Federation, applied for participation in a public offering project on “technology development toward realizing zero carbon steel,” sponsored by the New Energy and Industrial Technology Development Organization (NEDO). This technology is needed in the course of realizing a decarbonized society.

COURSE50 — Environmentally Harmonized Steelmaking Process Technology Development

Development of CO2 emission reduction technology, using hydrogen in the blast furnace reduction process

In the COURSE50 hydrogen ( coke oven gas) generated in a steel mill partially replaces carbon in the reduction process (a chemical reaction, which removes oxygen from iron oxides), in order to reduce CO2 emissions from a blast furnace by 10%.

In the immediate future, the blast furnace making process is expected to remain a mainstream ironmaking method technically and economically. We therefore need to move ahead further to establish a lower-carbon technology as transition technology leading up to the establishment of a 100% hydrogen reduction technology.

By using an independently-developed three-dimensional mathematical model and a 12m³ experimental blast furnace at the Kimitsu Area of the East Nippon Works, Nippon Steel has advanced development from both theoretical and experimental aspects to achieve a 10% CO2 emission reduction from the blast furnace.

The concept of the COURSE50 is to feed coke oven gas (hydrogen content of 60%) through tuyeres in the shaft of a blast furnace so as to raise the ratio of iron oxide reduction by hydrogen. However, the amount of hydrogen gas or coke oven gas generated in the steelworks is limited. The next step therefore is to establish outsourcing of a large supply of hydrogen gas and to substantially raise the share of reduction by hydrogen, a change equivalent to taking up the challenge of “Super COURSE50” or substantial CO2 emission reduction of over 10%.

Development of a chemical absorption method that enables CO2 separation and recovery at low cost

The chemical absorption method under development in the COURSE50 project is appropriate to separate and recover CO2 from large-scale emission sources, such as a blast furnace and a thermal power plant. The method achieved the world’s top-class performance and has been commercialized as ECAFTRM (Energy Saving Chemical Absorption Process) by Nippon Steel Engineering. In the meantime, in order to promote social implementation and dissemination of Carbon dioxide Capture and Utilization (CCU) and Carbon dioxide Capture and Storage (CCS), the cost to separate and recover CO2 must come down. We therefore aim at substantial reduction in this cost by developing an innovative absorption solvent, which reduces to an absolute minimum the energy required for removal of CO2 from the absorption liquid, which represents a substantial cost. In addition, use of unused exhaust heat within the plant waste is under consideration for reducing the cost of separation and recovery, so as to develop absorption liquid that enables CO2 osmation at lower temperature.

Establishment of a manufacturing method of dimethyl carbonate (DMC) from CO2 as a carbon source

Carbon dioxide Capture and Utilization (CCU) has recently been highlighted as a way to recycle CO2 as a useful carbon resource. Through joint research with Waseda University and chemical companies, we are developing a process to produce dimethyl carbonate (DMC) from CO2. DMC is an organic compound widely used as raw material for high-performance plastics and as electrolyte for lithium batteries. While the conventional production method used phosgene, a poisonous gas, we have developed cerium oxide catalyst as well as a de-hydration agent called 2-cyanopyridine, which enable low-pressure, low-temperature, high-efficiency reaction, resulting in an effective use of CO2. That there is no use of phosgene has also enhanced safety substantially. We will continue to vigorously seek for effective use of CO2 generated from the steelworks.

Introduction Nippon Steel's ESG Materiality Environmental Initiatives Social Initiatives Corporate Governance NIPPON STEEL CORPORATION Sustainability Report 2020 34 35
Contributing to Creation of a Circular Economy

Steel is a flexible, repeatedly-recyclable material that can sustain resource circulation: it is a perfect example of a circular economy. Nippon Steel strives for the greatest efficiency possible, including minimization or elimination of waste, in use of our energy and limited resources, in every process of steelmaking. Consequently, we work to recycle internally-generated by-products so that we can realize zero emission. We are also actively engaged in recycling of waste generated in society or by other industries.

Use of resources and energy efficiently
Nippon Steel’s steelworks use 100% of by-product gas generated in the steelmaking process, as fuel for heating of steel or as energy for an onsite power plant. Concerning water resources, 96% of water used in cooling and cleaning of products and manufacturing facilities are reprocessed and repeatedly used.

Promotion of in-house zero emissions
By-products generated and the amount finally disposed
In the iron and steel-making process, over 600 kg of by-products, such as steel slag, dust, and used refractory bricks are generated for each ton of crude steel produced. In FY2019, Nippon Steel produced 39.54 million tons of crude steel and generated 24.93 million tons of by-products. The majority of these by-products were recycled inside and outside the company and our final disposal of industrial waste amounted to 200,000 tons, partly due to a one-off factor. Nevertheless, we have maintained a very high recycling rate of 99%. We intend to continue reduction of final disposals.

Nippon Steel’s final disposal amounts

<table>
<thead>
<tr>
<th>Disposal method (wet weight)</th>
<th>FY2019 (million tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blast furnace dust</td>
<td>3.74</td>
</tr>
<tr>
<td>Blast furnace slag</td>
<td>6.33</td>
</tr>
<tr>
<td>Coke</td>
<td>3.02</td>
</tr>
<tr>
<td>Used refractory brick</td>
<td>2.87</td>
</tr>
<tr>
<td>Total</td>
<td>10.92</td>
</tr>
</tbody>
</table>

The amount in fiscal 2019 includes discarded bricks and other waste (26,000 tons) generated by a by-product gas recovery system and a dust capture system. Used refractory brick is primarily used as fuel in the coke oven.

Effective use of steel slag
Steel slag is almost entirely utilized. Approximately 70% of blast furnace slag is used for cement, while steelmaking slag is used for materials for road bases, civil engineering work, fertilizer, soil improvement, etc.

Blast furnace cement is a mixture of pulverized blast furnace slag and ordinary Portland cement, contributes to a 40% reduction of CO2 emissions during manufacturing, since the cement-making process can be omitted. It also exhibits superior long-term strength and is registered as an Eco Mark product. Due to the effects of reduction in mining of natural crushed stone and less energy consumption in the cement making process, steel slag products are designated as a “designated procurement item” under the Green Purchasing Law, and included in the Common Specifications for Civil Engineering Works compiled by the Ministry of Land, Infrastructure, Transport and Tourism.

Nippon Steel’s cement products, KAISHIRA®-GP, taking advantage of characteristics of steel slag, are used for forest roads and farm roads, as well as for weed preventive pavement to be installed near mega-solar panel installations and other locations.

Geo-Tizer® made of steel slag can be mixed with soft soil (such as surplus excavated soil from construction sites or farmland soil) to reform the soil to make it usable. Unlike conventional soil-improvement materials (i.e., cement and lime), this soil produces less dust, significantly controls CO2 emissions, and is less expensive, enabling reduction of construction cost. The remade soil is outstanding in compacting and can also be easy to be dug again, without being excessively saltified.

Calcia modified soil — a mixture of steelmaking slag and dredged soil — has been used to improve the marine environment, such as by bulldozing deep-dug seabed areas and creating shallow bottoms and tidal flat. In addition, Nippon Steel’s Shinya™ iron supply units, which are composed of steel slag and humus made from waste wood, are placed around areas near the sea bed that had lost much of its living organisms. For p. 33

Moreover, as steel slag contains nutrition that helps plants grow, it is also widely used as fertilizer, contributing to improving farming productivity.

Recycling of dust and sludge
To recycle the dust and sludge generated in the iron and steelmaking processes, for them to be used as raw materials, Nippon Steel operates a dust reduction line (DRG: Resource circulating oven) at East Nippon Works Kashima Area and a rotary hearth reduction furnace (RHF) at East Nippon Works Kitamsu Area, Setouchi Works Himinata Area, and Kiyoku Works Oita Area (Yakata). This enables us to recycle all internally-generated dust. In March 2009, we obtained special approval for RHF under the Waste Disposal Act to carry out recycling of externally-generated dust as well.

Contributing to worsening waste plastic problems
Nippon Steel recycled 100% of plastic containers and packaging used and collected from households, using a coke oven and a chemical recycling method. Specifically, after thermal decomposition (in the coke oven), 40% is collected as hydrocarbon oil and recycled into plastic products; another 40% is collected as coke oven gas and used as energy at a power plant within a steelworks; and the remaining 20% is coke and used in the ironmaking process.

We have established a system to receive waste plastics from local governments nationwide and are handling about 200,000 tons per year, equivalent to roughly 30% of waste plastics collected all over Japan. Our method of using coke oven has an extremely high recycling efficiency and a great treatment capacity, contributing to a circular economy in many regions. The cumulative amount processed in FY2000–2019 was approximately 3.28 million tons, equivalent to 10.50 million tons in terms of reduction in CO2 emissions. Recently, we have begun to recycle chemical fibers and food trays mainly into plastic products, under the same recycling method. We intend to work on technology development such as efforts to increase processing capacity, in order to satisfy growing needs for plastic processing for environmental objectives.

Moreover, our plastic recycling plant in each steelworks is open for visits by the public. The East Nippon Works Kitamsu Area, being located close to the Tokyo Metropolitan Area, welcomed 8,650 visitors in FY2019, contributing to environmental education in the community.

< Recycling of waste plastics >

Thermal decomposition enables 100% effective re-use of plastics

By-products and recycling (FY2019)

<table>
<thead>
<tr>
<th>By-product</th>
<th>Amount generated (wet weight - million tons)</th>
<th>Recycling application</th>
<th>Recycling rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blast furnace slag</td>
<td>12.78</td>
<td>Blast furnace cement, fine aggregate, road base, coke, etc.</td>
<td>100%</td>
</tr>
<tr>
<td>Steelmaking slag</td>
<td>5.60</td>
<td>Blast furnace cement, fine aggregate, road base, coke, etc.</td>
<td>99%</td>
</tr>
<tr>
<td>Dust</td>
<td>3.02</td>
<td>Raw materials for use in in-house gas production</td>
<td>90%</td>
</tr>
<tr>
<td>Sludge</td>
<td>0.49</td>
<td>Sludge</td>
<td>100%</td>
</tr>
<tr>
<td>Coke ash</td>
<td>0.52</td>
<td>Coke ash, etc.</td>
<td>100%</td>
</tr>
<tr>
<td>Coal ash</td>
<td>0.36</td>
<td>Coal ash, etc.</td>
<td>100%</td>
</tr>
<tr>
<td>Other</td>
<td>2.67</td>
<td>Coke ash, etc.</td>
<td>100%</td>
</tr>
<tr>
<td>Total</td>
<td>24.93</td>
<td>Total recycle rate</td>
<td>99%</td>
</tr>
</tbody>
</table>

FY2019 dust collected with a dust collector:
1. Solid dust removed from industrial emissions or sewage treatment
2. Solid dust removed from industrial emissions or sewage treatment
3. Solid dust removed from industrial emissions or sewage treatment

Introduction Nippon Steel’s ESG Materiality Environmental Initiatives Social Initiatives Corporate Governance
Promotion of Environmental Risk Management

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.

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 windscreens, windbreak 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.

In April 2018, the Amended Air Pollution Control Act became effective in Japan; it regulates the mercury concentration in emission gas for waste incinerators. At our facilities mercury contained in waste gas is effectively captured by dust collectors or is absorbed by activated carbon so as to reduce the release of mercury in the atmosphere. We routinely measure the regulated mercury concentration in emission gas for waste incinerators and ensure that our facilities 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, formulated by the Japan Iron and Steel Federation (JISF) in April 2018. We confirmed conformance with the voluntary management standard at all facilities subject to the voluntary initiatives in FY2019 as we did in FY2018. These results and evaluations are disclosed on the JISF’s website every year. Through such efforts, we strive to prevent mercury emission into the air.

Water risk management
We use about 8.5 billion m³ of freshwater 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 for their discharge of wastewater into rivers and lakes and controlling work procedures. Moreover, our steelworks have taken measures, such as to install a large storage tank so that water tainted with iron 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.

Water purification; prevention of abnormal waste water

Water and chemical are sprayed on piles of iron ore and coal to restrain the scattering of dust materials.

Spraying of water and chemical in coal yards

Dust generated in the burning process is collected by two types of dust collectors (electric or with bag filter), depending on the characteristics of the dust (i.e., particle size distribution, emission gas concentration).

Dust collectors with bag filters

Windbreak net at yards

A windbreak net is installed to reduce the strength of wind and restrain the scattering of raw materials.

Electric dust collectors

Wet type desulfurization equipment

The wet desulfurization method enables SOx in emission gas to be eliminated.

Active coke dry type desulfurization equipment

The dry desulfurization method enables SOx in emission gas to be eliminated.

Low NOx regeneration burners

Burners featuring reduced levels of NOx generation and outstanding fuel savings have been installed.

Activated sludge treatment equipment

Organic matter is decomposed and eliminated by bacteria.

Waste water automatic monitoring equipment

The water quality of waste water is automatically monitored.

Checking of embankments

The embankments are regularly inspected from the sea side to find potential issues.

Repair of the damaged area of embankment

Damaged areas held by riprap are promptly sealed to maintain and manage the embankment in a sound condition.

Sprinkler trucks

These trucks spray water on the road and empty lots or clean the road within works to restrict the secondary scattering of dust.

Road cleaning trucks

Dust collectors with bag filters

Activated sludge treatment equipment

Sprinkler trucks

Road cleaning trucks

Dust collectors with bag filters

Activated sludge treatment equipment

Sprinkler trucks

Road cleaning trucks

Dust collectors with bag filters

Activated sludge treatment equipment

Sprinkler trucks

Road cleaning trucks

Dust collectors with bag filters

Activated sludge treatment equipment

Sprinkler trucks

Road cleaning trucks

Dust collectors with bag filters

Activated sludge treatment equipment

Sprinkler trucks

Road cleaning trucks

Dust collectors with bag filters

Activated sludge treatment equipment

Sprinkler trucks

Road cleaning trucks
**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 landfill modification work such as excavation which is required to be reported. We conduct pollution surveys when needed.

Starting in FY2018, the Revised Soil Contamination Countermeasures Act is being enforced in stages 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, and 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, and the disposable amount. Similarly, we take care in managing the Volatile Organic Compounds (VOCs), which are said to cause photochemical oxidants and suspended particulate matter.

In complying with the Chemical Substance Evaluation 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 steelmaking materials and equipment that contain hazardous materials, such as polychlorinated biphenyl (PCB) and mercury. According to safe handling standards, we systematically replace or dispose of hazardous parts and materials, given the time limit for disposal or the expiration date, stipulated 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, we monitor 462 chemical substances according to the voluntary control manual developed by the Japan Iron and Steel Federation (JISF), which was absorbed in April 2020.

**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 its status of occurrence, (2) appropriate selection and continuous management of collectors, transporters, and disposal contractors, and (3) appropriate management of Manifests (industrial waste management documentation).

In order to enhance compliance in waste treatment by appropriately managing the Manifests, all Nippon Steel steelworks and offices have achieved levels of emissions far below the voluntary reduction target, based on the JISF guidelines, relative to FY1997.

**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 far below the voluntary reduction target, based on the JISF guidelines, relative to FY1997.

- **Benzene, tetrachloroethylene, dichloromethane**
  
  We developed a voluntary reduction plan of hazardous air pollutants specified in the environmental standard, with the exception of tetrachloroethylene which we did not handle. As a result of our undertaking, we have already reached the targets for all three pollutants and have maintained the target levels.

**Emission of VOC**

1) For an abbreviation of the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Prevention of Improvements in the Management Control Law concerning Pollutant Release and Transfer Register (PRTR).
2) For an abbreviation of the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.
3) Volatile organic compounds (VOC): Organic chemical compounds emitted into the atmosphere in the form of gases, which are considered to be the source of sustainable surface particulate and photochemical oxidants, which became subject to control under the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture in 1999, as amended.

**Appropriate selection and continuous management**

- **Collectors, transporters, and disposal contractors**
  
  In order to select and manage the Manifests, we select and manage the Manifests, all Nippon Steel steelworks and offices have adopted the e-Manifest system and fully utilize it for waste management.

- **Electronic Manifest**
  
  We also evaluate collectors, transporters, and disposal contractors based on the information obtained from the Manifests, and continuously and appropriately manage the Manifests.

We have similarly been working on reducing volatile organic compounds (VOCs). In FY2009, the 30% reduction target relative to FY2000 was achieved. Since then, low discharge levels have been maintained.

**Prevention of scattering of dust**

In the steelworks, road sweepers collect dust and dirt, and moisten road surfaces, in order to restrain the scattering of dust and dirt, piled on the road or in a vacant site, by movement of vehicles or by wind.

As an example, the Kyushu Works Yawata Area currently has seven road sweepers and seven road sprinklers in operation day and night. These 14 vehicles sweep and sprinkle about 450km of road every day. This is equivalent to the distance between Tokyo and Kyoto. We are further improving the effect of road cleaning by introducing washing and suction type cleaning vehicles, which clean better than conventional road sweepers, and small road sweepers for narrow spaces.

**Noise reduction measures**

Nippon Steel conducts the surveys of noise source via noise frequency analysis, forecasts sound propagation, and implements appropriate noise reduction measures. The measures include air conditioning of noise source, application of noise absorption materials, and installation of noise insulation boards. In addition to daily management of potential noise-source equipment, we regularly make a noise measuring test to confirm that the noise level is below the regulatory standard stipulated by the government and municipality.

Further, the forest we cultivate at the property line of steelworks site has the effect to depress noise, in addition to its role to prevent the scattering of dust and to absorb CO2.

**Introducing other initiatives in the website**

Initiatives on Conservation of Biodiversity

As a member of Nippon Keidanren (Japan Business Federation), Nippon Steel has affirmed the Declaration of Biodiversity by Keidanren and Action Policy (revised in October 2018) and has accordingly taken initiatives on biodiversity preservation under the following policy.

Policy for the future

- 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 resolving 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 (Chuya-no-mori), 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).

Wild birds and animals visit the forests we make and maintain at our steelworks sites across Japan. Wild birds and animals inherent to the land return to the forests. Thus, the “Creation of Hometown Forests” helps conserve biodiversity, and sequester CO2.

**“Creation of Sea Forests”**

Implemented in 38 spots in Japan to improve sea desertification

With an 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 Tokyo University and uses it to promote regeneration of seaweed beds. While humic acid iron 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 iron by using steel slag 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 seaweed by ruffe. This project is also expected to restore once-atrophied seabedurchin. This project is also expected to restore once-atrophied seabed.

**Participation in community projects**

Participation in ecological preservation activities in the community

Since 2012, the Nippon Steel 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 visits, 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 being used for rice cultivation

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. Silica contained in steel slag promotes photosynthesis by keeping leaves upright and improving their light receiving orientation, while iron is effective in preventing root rot and leaf blight. The steel slag also contains phosphoric acid, manganese, boron, and various other components of fertilizer. Nippon Steel donated converter 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 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.

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 resolving 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 (Chuya-no-mori), 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).

Wild birds and animals visit the forests we make and maintain at our steelworks sites across Japan. Wild birds and animals inherent to the land return to the forests. Thus, the “Creation of Hometown Forests” helps conserve biodiversity, and sequester CO2.

“Creation of Sea Forests”

Implemented in 38 spots in Japan to improve sea desertification

With an 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 Tokyo University and uses it to promote regeneration of seaweed beds. While humic acid iron 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 iron by using steel slag 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 seaweed by ruffe. This project is also expected to restore once-atrophied seabed.

Participation in community projects

Participation in ecological preservation activities in the community

Since 2012, the Nippon Steel 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 visits, 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 being used for rice cultivation

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. Silica contained in steel slag promotes photosynthesis by keeping leaves upright and improving their light receiving orientation, while iron is effective in preventing root rot and leaf blight. The steel slag also contains phosphoric acid, manganese, boron, and various other components of fertilizer. Nippon Steel donated converter 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 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.
Social Initiatives

With the aim of contributing to growth of a sustainable society and to maintenance and improvement of corporate value, Nippon Steel has identified our ESG materiality and has been working on its initiatives. Some of our social initiatives in each materiality are presented below.

Safety and health initiatives

In keeping with the corporate philosophy that “safety and health are the most valuable factors that take precedence over all other things and they are the basis that supports business development,” we have firmly kept our manufacturing priorities in all of our activities. We have been improving our Occupational Safety and Health Management System (OS&HMS) and strive at making safe and secure workplaces. The Basic Policy on Safety and Health is applied to Nippon Steel as well as to related or subcontracting companies.

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. We compile and make known effective examples of accident-preventive measures and measures based on analysis of actual accidents. As a result of continual execution of these measures, safety improved in FY2019. There were 8 accidents for Nippon Steel’s employees and 10 for employees of subcontracting companies (including two fatal accident for Nippon Steel and one in subcontracting companies). The accident frequency rate was 0.09 (compared to Japan’s steel industry average of 0.89) and the accident severity rate was 0.08 (comp. 0.21). We will continue to strive for a safe work environment with the safety wellness targets for FY2020 that are zero fatalities/severe accidents and less than 0.10 as the accident severity rate. We will also maintain the accident frequency rate.

Acquisition of third-party certification

In fiscal 2019 Nippon Steel adopted a plan for all our workplaces to obtain the ISO (JIS) Q1 45001 Health and Safety certification (published in March 2018) by the end of fiscal 2021. The Kansai Works Wakayama Area became the first steelmaker in Japan to obtain it in December 2019, followed by the Amagasaki District of the same works.

Safety training

We make efforts to improve training for accident prevention. The safety training programs are attended by all newly-appointed managers of manufacturing workshites (108 managers in FY2017, 91 in FY2018 and 42 in FY2019). Our Taikan 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

Nippon Steel finds that the harmonious coexistence with customers, communities, and society is most precious. Prevention of disaster, which may harm our credibility, is important for continuation of our company. We therefore aim at enhancing disaster prevention management by establishing a structure of autonomous, continual activities, and taking measures to reduce disaster risks and prevent disaster occurrence.

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 implementation of measures against risks that emerge from instances of disaster, to prevent recurrence; 2) identification of disaster occurrence risks based on risk assessment plant by plant and by each of their process technology divisions; and implementation of tangible/intangible measures to reduce risks and control residual risks; 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

1. Prevention of disaster recurrence (mitigating risks exposed by disaster)
   - Enhance drills for initial response (drills at all plants in all steelworks; enhanced drill programs)
   - Improve fire-fighting capacity of the in-house fire defense function, in cooperation with experts (joint fire drills with 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)

2. Disaster prevention risk assessment (identification of new potential disaster risk)
   - Identify and assess risks in manufacturing sites; manage residual risks; promote drafting of 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

3. Measures to mitigate existing risks (measures for disaster prevention equipment)
   - Prevent disaster recurrence; investment in measures for compliance and risk assessment

4. Auditing concerning disaster prevention
   - Voluntary monitoring by disaster prevention organization at each steelworks for regular check-ups and corrective action on the status of disaster prevention activities at the manufacturing workfront
   - Regular check-up and corrective action on the implementation status of disaster prevention management of each steelworks based on the hearings in the head office

5. Measured against earthquakes and tsunami
   - Promote measures in order 1) human damage prevention, 2) area damage prevention, and 3) production measures
   - When a Nankai Trough earthquake emergency warning or alert is announced and act under the policy. Deviate measures based on the assumption of a) submarine zone earthquake and tsunami around Japan Trench and Chirihama Trench

6. Third-party monitoring toward enhancing safety competency in steelworks
   - Assessment of steelworks by an NPO, the Japan Safety Competence Center

7. 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

Quality management is one of the most important aspects in obtaining the trust and satisfaction of customers in the provision of products and services. All of our relevant employees are responsible for thorough quality management. In coordination with product units and individual steelworks, the Company’s Quality Assurance Department promotes measures to cope with Groupwide quality control and assurance issues.
Many of our steelworks are passing a 50-year milestone since the start of our group and at appropriate times measures are launched to resolve the related issues. The key points of this inspection include compliance with the guidelines of the Japan Iron and Steel Federation; compliance with standards and specifications; and confirmation of continual improvement activities for quality internal control. The auditing plan is written once a year for each steelworks and areas and once every three years for each office of group companies, in order to reduce quality risks. We also receive external reviews, such as ISO9001 and JIS certifications to raise the credibility of the quality management system. 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, to raise the credibility of identification as well as testing and inspection of actual products. In addition, diverse opportunities to acquire basic knowledge on quality compliance and quality management are provided internally and for group companies, and an e-learning program is offered to those in charge of quality compliance and quality management every year, to assist them to expand knowledge. For overseas group companies, the e-learning program is developed and delivered in each local language. We thus strive to raise quality awareness of all group employees. Using leverage of our quality management organization, we will continue our daily efforts to improve customer satisfaction and further raise our branding power of trust.

**Measures in hard aspects**

**Initiatives to standardize manufacturing**

We have carried out activities to visualize and standardize the know-how of our veteran workers in each workplace, and have so far standardized 74,000 points. By FY2018 we completed documentation of technical standards, which will be used throughout the company. We have also investigated the causes of problems at production facilities, and shared what we found out. Going forward, we intend to raise our ability to pursue causes of problems and draft countermeasures, and standardize these steps, as a part of operational processes. At the same time we promote activities to prevent problems and their recurrence, which contribute to more stable production.

**Initiatives for stable procurement**

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 toward realizing a sustainable society. We purchase around one million product items of equipment and materials from gigantic facilities such as blast furnace 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. Based on our basic policy, our aim is to realize a top-flight purchasing strategy, with a focus on dialogues with suppliers. Aiming at enhancing dialogue with suppliers, we have organized a Material/Equipment Procurement Partners Meeting, to be held once every three years with an objective to share our purchasing policy, which was set in FY2018, the first year of the new mid-term management plan, in light of our new management strategy. In FY2018, about 1,300 suppliers joined our first Partners Meeting, where we agreed to share our purchasing policy that emphasizes thorough compliance, product safety, ensuring of quality, cost, and delivery (QCD), advancement of technology development capability, consideration of human rights, labor environment, safety and health; environment conservation; and thorough information sharing of issues. Moreover, we have participated 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.

**Basic policy on equipment procurement**

- Compliance with laws
- Equal opportunities
- Building of a partnership
- Fair disclosure of information and quick transaction processing
- Consideration to protect environment and promote green purchasing activities
- Preservation of confidentiality

**Psychological measures concerning quality assurance**

Respect for human rights and promoting diversity & inclusion

Nippon Steel respects human rights and strives to create the working environment which allows diverse human resources to be more empowered.

(1) Respect for human rights

Respect for human rights

In compliance with the United Nations Declaration of Human Rights and other international norms on human rights, the Nippon Steel Group is in the business of creating and delivering valuable and attractive products and ideas, by respecting our employees’ diverse views and individualities and utilizing them for the good of all. Based on the United Nations Guiding Principles on Business and Human Rights, the Nippon Steel Group Conduct Code has been set. By adhering to its nine principles, Nippon Steel conducts business ethically, while paying full heed to human rights issues arising with the increasing globalization of the economy. Nippon Steel gives due attention to the rights of workers, and staunchly opposes the use of forced or child labor. These are prerequisites of our corporate activities. We also have prohibited as unjust the discriminatory treatment of workers based on nationality, race, belief, creed, gender, age, sexual orientation, and disability. In addition, we give careful consideration to the traditions and culture, business practice, and labor practice of each country or region as we accelerate overseas business development.

Dealing with human rights risks and labor risks

Nippon Steel holds a corporate-wide human rights and anti-discrimination promotion forum every year, adopted the policy of dealing with human rights issues, and conducts workshops and other awareness-raising activities for employees. 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.

In case of abuse of human rights, including harassment, or a labor-related problem that became known through a whistleblow contact to our Compliance Consulting Room, for example, we are prepared to handle the issue appropriately upon investigation of the facts. In case of executing a new business, we take appropriate actions in order to prevent occurrence of human rights or labor issues.

Communication on human rights with stakeholders within and outside the company

Nippon Steel considers it important to communicate with stakeholders within and outside the company to deal with human rights risks. We have set up a Compliance Consulting Room to receive notifications or inquiries concerning harassment and other abuse of human rights from the Group’s employees and family members, and from business partners. Notification and consultation from other stakeholders are accepted in the form of responses to an inquiry menu on Nippon Steel’s website. Each of these whitelisting and consultation matters are given appropriate attention, including our providing guidance or training to the related parties, consistent with advice from lawyers and other professionals when needed.

Prevention of forced or child labor

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

Respect the rights to organize and to bargain

Adhering to laws and the group-company labor agreements, and respecting the rights to organize and to bargain, Nippon Steel strives to establish sound labor relations by sincere talks with organized labor. We hold regular meetings to discuss diverse issues including management issues (i.e., safety and health, production), labor conditions (i.e., wages and bonuses), and balance in work-life. Through exchange of opinions with union representatives, we seek close labor-management communication.

Labor union membership and ratio (as of March 31, 2020)

| Membership ratio | 100%
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>25,765</td>
</tr>
</tbody>
</table>

Compliance concerning salaries

In compliance with laws and regulation concerning salary and wages payment, Nippon Steel has set up 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.

Promotion of balanced work-life

Nippon Steel complies with labor laws and regulations of each country where it operates, and strives to create a work environment that allows each and every employee to do their best. We promote balanced work-life by encouraging employees to fully use their paid holidays and to control the number of work hours, and to keep the time worked at a suitable level. This is done with cooperation by labor unions. As a part of initiatives on Workstyle Innovation, we are expanding the working system from the viewpoint of fully utilizing the optimized work time and to help enable all employees to realize their full capacity. In fiscal 2019 we began a telework program, in addition to being concerned with workstyle and operation management that leads to more efficient, higher-value-added output, the program is proactively utilized to cope with the COVID-19 infection problem.

Nippon Steel also has diverse welfare programs to support employees’ personal life: provision of housing, including dormitories and company housing, and a cafeteria plan (work-life support program).

Achievement related to balance in work-life

The ratio of paid holidays taken (result in FY2019) 81.3%

(2) Diversity & inclusion

Diversity & inclusion

In an aging society that has a declining birthrate, Nippon Steel has promoted diverse measures aimed at establishing such a work environment, whether at clerical, manufacturing, or maintenance work sites, that empowers diverse people, including elderly persons and women.

We have introduced programs such as a childcare leave system which is more generous than legally required, a leave program to assist overseas relocation of the spouse, and a temporary exempting program for employees who have difficulty in relocation for child or elderly care and other reasons. Moreover, we have opened 24-hour childcare centers for use by shift work employees in steelworks. We are thus enhancing programs to support employees’ work-life balance.

At present, the ratio of women in overall hiring is about 20%. We are committed to steadily implementing various measures toward our target to double the number of women in managerial positions from the level in 2014 by 2020 and triple it by 2025. Concerning promoting the empowerment of elderly, we have decided to raise the retirement age from 65 to 67 in fiscal 2021. This change reflects the decline in the working population and the raising of pension eligibility age, and was made also from the perspective of maintaining and enhancing our on-site manufacturing capacity. Recognizing employment of the disabled as an important social challenge, we are implementing an action plan for their employment, using special purpose companies, and by providing a friendly working environment.

Diversity & inclusion

Diversity & inclusion

The ratio of women in overall hiring (Average ratio from FY2015 to FY2020) 20%

Achievement related to diversity & inclusion

Number of women appointed in managerial positions (result in FY2020) 14%

Number of women in overall hiring (Average ratio from FY2015 to FY2020) 20%

Office staff and engineers 34%

Operators and maintenance personnel 14%

Overall hiring 20%

Number of women in overall hiring (Average ratio from FY2015 to FY2020) 20%

Office staff and engineers 34%

Operators and maintenance personnel 14%

Overall hiring 20%

Target

Target to double the number of women in managerial positions by 2020 and triple it by 2025, compared to that of 2014

Number of those re-employed (FY2019) 125 (81) in 2014

Number of disabled-person employees (as of June 2020) 49

Disabled-person employment rate (as of June 2020) 125 (81) in 2014

Respect for human rights and promotion of diversity & inclusion

For further information, please visit our website, “Sustainability - Partnerships with Employees.”
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.

(1) Utilization and development of human resources

Personnel development policy

Nippon Steel’s basic approach to personnel development is on-the-job (OJT) training – supervisors transfer to their subordinates knowledge and operational skills as well as how to do the job and think about it. This is done through everyday dialogues. The Personnel Development Basic Policy has been developed in order to express the policy and apply it to all employees. It is summarized below.

1. Personnel development is nothing but one aspect of business.
2. OJT training is a basic of personnel development and is complemented with off-the-job training.
3. A supervisor shares clear objectives and outcomes of personnel development with his/her subordinates.
4. Every employee ceaselessly strives to develop skills and knowledge.

The core of the Basic Policy is based on supervisor-subordinate dialogues for personnel development.

For employees in office positions, diverse types of off-the-job training sessions are conducted for acquisition of specific skills or themes which are not covered in OJT, and to acquire required training geared to specific career levels.

With regard to employees in manufacturing and maintenance who have acquired a clear understanding of the skill to be acquired through supervisor-subordinate dialogue, a specific development plan is drafted and carried out. The status of development and skill transfer is evaluated through everyday dialogues between supervisors and subordinates.

Securing of personnel

Nippon Steel carries out fair and impartial hiring activities, based on the Kerdaren (Japan Business Federation) Charter for Good Corporate Behavior. Our activities for securing the number and kinds of new hires includes an internship program and welcoming young students entering the job market to plant visits.

Development of personnel who support 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.

In order to develop employees who promote our overseas business expansion we put efforts into international education, such as training of young executives, intercultural learning programs and study abroad, aimed for acquiring knowledge and skills needed for business management and for nurturing a global mindset.

Personnel treatment system

Nippon Steel’s administering of personnel policies aim at encouraging our employees to grow and develop their overall capabilities, from the time they join the company until they retire. We also find it important to ensure consistent, fair treatment of all employees regarding their capability and achievement, by methods including through dialogue between supervisors and subordinates.

Physical wellness

Using the corporate-wide medical checkup system which focuses on serious disease risks, Nippon Steel thoroughly manages health guidance on the basis of managing risks, and decides the frequency of medical checkup as part of that health maintenance effort. In addition, as a measure against lifestyle-related diseases, a recurring event to promote specific health guidance and lifestyle modification named the Health Challenge Campaign is conducted in cooperation with the health insurance association. In addition, cancer screening tests are broadly conducted for stomach cancer and breast cancer, or for breast cancer and uterine cervix cancer; depending on age and gender of employees, with the aim of early detection.

Mental wellness

Aiming for each employee to enjoy a robust life on and off the job, we provide a consulting service for prevention and early detection in the areas of mental health, and have incorporated the issue of mental health in house seminars. 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 team, and how to use or coordinate with the corporate physician, nurses, and other staff. Using an annual stress check result to approach teams and individuals to give guidance for improvement, workplaces coordinate with the personnel department and the health department in contributing to a vigorous work environment, and implement necessary measures according to the issues of a team or an individual.

Support to employees who work overseas

In order to enable employees who work overseas to work without 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 specialized medical assistance programs is provided. Under the policy of providing continuous health management support during overseas assignments, interviews with occupational health staff are conducted via a video-conference system and other means; in addition to regular medical checkups. Moreover, one of the company’s physicians periodically visits overseas offices, researches local medical institutions and the daily-life environment, and meets with employees to offer advice.

Commitment to wellness by both the company and employees

Efficient, creative, and healthy workstyle

Employees

Company

Occupational wellness staff

Try to make improvement and check the check-up results

Baseline medical check-up

Efficient, creative, and healthy workstyle

Committee of health

Federation of Nippon Steel Workers’ Unions

Human Resources Div.

Health promotion department

Labor-management council

Committee of health insurance

Committee of health promotion

Challenge Campaign

Nippon Steel

Human Resources Div.

Health promotion planning department for the whole company (corporate physicians, nurses, and social health staff)

Strengthen

Health promotion department in overseas

promotion

Objective

Promote measures to develop human resources who serve the enhancement of workplace strength and technological advancement.

Rate of voluntary termination

1.6% (FY2019)

Number of employees

27,096 (number of women in parenthesis) 27,096 (2,670) (March 31, 2020)

Number of new hires

1,438 (number of women in parenthesis) 1,438 (228) (FY2020)

Average years of service

15.1 years (March 31, 2020)

Status of voluntary termination

1.6% (FY2019)

Utilization and development of human resources

For further information, please visit our website, “Sustainability - Partnerships with Employees.”

For further information, please visit our website, “Sustainability - Partnerships with Employees.”

(2) Promotion of the health of employees

To help ensure we are an energetic company where all employees work at their best and stay healthy from joining the company until retiring, we promote health promotion measures with a focus on disease prevention. Specifically, the company is committed to providing a full health checkup menu and enhanced attention to benefit the mental and physical wellness of employees, while employees are expected to also be committed to implementing measures for their own health maintenance. We believe that these measures will be sources of willingness to work, contributing to balancing work with health by staying healthy and, in case of illness, by continuing to work while being treated, when conditions permit.

Number of training/learning hours (FY2019)

1,54 million hours/year (57 hours/year per employee)
Having many manufacturing bases all over Japan, Nippon Steel has a long history of being engaged in business activities rooted in local communities and supported by local residents. In accordance with our attitude of maintaining harmony with local communities and society, we have implemented distinctive social contribution programs, mainly through promotion of environmental preservation, and through education, music, sports, and international exchange.

Environment preservation activities, jointly with local communities

Collaboration with an NPO, “Mori wa Umi no Koibito”

The Toko-Branch of Nippon Steel is a regular corporate member of the NPO, Mori wa Umi no Koibito (The forest is longing for the sea, the sea is longing for the forest), represented by Mr. Shigeatsu Hatakeyama, a fisherman raising oystlers and scallops in Karasuma 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 Munmune Mountain in Toke 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 FY2019, 64 of Nippon Steel’s employees and family members joined the 31st tree-planting activity.

In fiscal 2020, a tree-planting festival, scheduled in June, was canceled due to the COVID-19 outbreak. However, we will continue to participate in such activities in the future.

Collaboration with an NPO, “green bird”

Nippon Steel has conducted four garbage pickup events in Harajuku & Omotesando, Shibuya, Nagoya, and Kawasaki jointly with an NPO “green bird,” which was created based on the concept of “a clean city will make people’s hearts clean.” Green bird’s eco-friendly activities were linked to steel as an eco-friendly, highly-recyclable material used in steel containers from the LCA viewpoint, leading to our collaborative action. This has become a major project of 90 teams in Japan and abroad, with 33,000 participants per year.

Providing education on manufacturing and the environment

Training programs for educators at private companies

We support the “Training Programs for Educators at Private Companies”, so that teachers can better understand how the steel industry is contributing to society and can better appreciate the fascination of product-manufacturing. In 2019, we hosted 128 teachers for the tours of our facilities and our human development activities.

Demonstrating the joy of product-manufacturing through “Tatara Ironmaking”

With the aim of showing children the joy of product-manufacturing, Nippon Steel has been holding demonstrations on “tatara ironmaking” — Japan’s indigenous ironmaking technique — in every year.

Support of community-based education

Nippon Steel has been engaged in unique community-based environmental education support programs and educational activities on “Monodokushirikai, product-manufacturing.” For example, the East Nippon Works organized a scientific display stand and introduced the fascinating properties of steel and how electricity works to primary and secondary school children. Our employees at the Kyushu Works gave a “travelling scientific lecture” at primary and secondary schools, while Nippon Steel’s Head Office staff took part in an Energy and Environmental Workshop held by a secondary school and introduced the steel industry’s environmental initiatives, showing an example of recycling of waste plastics. We also donate to the Tokohu University’s project which aims at teaching children in the stricken areas of the East Japan Earthquake and Tsunami of 2011 what to do against natural disaster risks.

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 endowed a university course, which also contributes to one of our business strategies, “enhancement of our technological superiority.”

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. About 130,000 people visited our steelworks in FY2018.

Together with government and public institutions

• Suggestions on public policies via the Japan Federation of Economic Organizations (Kokkaiendo) and the Japan Iron and Steel Federation (JSF)
  • Express opinions on deregulations and institutional reforms for maintenance and enhancement of a vibrant economy in Japan
  • Promote measures toward Japan’s achievement of the Paris Agreement goals for 2030 via the JSF, in which Nippon Steel plays a leading role
  • Advocate needs for transparency, stable supply of hydrogen, which is expected to play a critical role in CO2 reduction efforts

• Participation in government councils, study groups, etc.
  • Participate in the deliberation process of public policy, such as infrastructure development, environment & energy, and economic regulations.
  • Appointed as a member of the Central Environment Council of Ministry of the Environment, a member of the Steering Committee of the Task Force on Climate-related Financial Disclosures (TCFD) Consortium, hosted by METI, etc.

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

In addition to contributing to development of society and economy by providing steel, a basic material, as we have done since the company was founded, Nippon Steel has a long history of activities in the support of art, music, and sports, with the aim of helping people realize a healthy, emotionally enriched life and helping society truly develop.

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 communities 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.

Initiatives for dialogue enhancement

For shareholders, Nippon Steel strives to proactively provide information and cooperatively respond to questions raised by them at the General Meeting of Shareholders. In addition, we regularly hold corporate briefings and plant tours, and publish information brochures to promote shareholders’ understanding and enhance communication with them. For institutional investors we host briefings on quarterly results briefings and a mid-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.

Visit to distributors

Corporate Governance

• Adherence to relevant laws and regulations, and building of an appropriate relationship with government and public institutions
  • Comply with laws and regulations, based on the Nippon Steel Group’s Corporate Philosophy and Code of Conduct
  • Adopt and adhere to corporate rules and guidelines on prevention of corruption of public officials in Japan and abroad, compliance with anti-monopoly law, environmental regulations, protection of personal information, etc.
  • Appropriate tax payment
  • Comply with relevant laws and regulations, and pay tax appropriately
  • Eliminate alleged action to evade taxes and bear an appropriate tax burden
  • Maintain transparent, constructive communication with tax authorities

Involvement in public policies and legal compliance

• Appropriate tax payment
  • Comply with relevant laws and regulations, and pay tax appropriately
  • Maintain transparent, constructive communication with tax authorities

Introduction Nippon Steel’s ESG Materiality Environmental Initiatives Social Initiatives Corporate Governance
Corporate Governance

Nippon Steel has established a corporate governance system suited to the businesses of the Nippon Steel Group in order to achieve the sound and sustainable growth of the Nippon Steel Group and increase its corporate value over the medium- to long-term, in response to the mandate delegation of responsibilities by and trust of all stakeholders, including its shareholders and business partners.

Corporate governance structure and internal control system

For the purpose of appropriately responding to greater fluctuation of changes in the surrounding business environment and accelerated speed of change, Nippon Steel made a transition from a Company with an Audit & Supervisory Board to a Company with an Audit & Supervisory Committee in June 2004. Through this change, Nippon Steel 1) aims to enhance discussions by the Board of Directors relating to matters such as the formulation of management policies and strategies and strengthen the supervisory function of the Board of Directors over management; and 2) delegates part of the decisions regarding execution of important operations, according to the policy and strategy to the Representative Director and Chairman, and Respectively and Representative Director and President, thereby expediting management decision-making.

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) 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 execution 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, the Board of Directors, there are 23 company-wide committees in total, including the Ordinary Budget Committee, the Plant and Equipment Investment Budget Committee, the Investment and Financing Committee, the Fund Management Committee, the Technology Development Committee, the Environment Management Committee, and the Risk Management Committee, depending on each purpose and area.

2. Internal control system and risk management system

(1) Internal control system based on autonomous internal controls

To comply with applicable laws and regulations, and ensure integrity of financial reporting and effectiveness and efficiency of business, Nippon Steel has established internal control and 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 cooperates closely with each area’s functional division in charge of risk management, develops annual plans concerning internal control and risk management, prepares a scheme for check and review, regularly ascertains the status of internal control across the entire Group, and works at continual improvement.

(2) Risk management supervisory system

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 Company 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.

(3) Whistleblower system

As a whistleblower system, the Compliance Consulting Room (internal contact: the Internal Control & Audit Division; external contact: an external professional organization) 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 Room 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 violation of laws, and to improve operations.

For further information, please refer the Integrated Report 2020 pp. 85–98.
Independent Assurance Report

To the Representative Director and President of Nippon Steel Corporation

We were engaged by Nippon Steel Corporation (the “Company”) to undertake a limited assurance engagement of the environmental performance indicators marked with ⋆ (the “Indicators”) for the period from April 1, 2019 to March 31, 2020 in its Nippon Steel Sustainability Report 2020 (the “Report”) for the financial year ended March 31, 2020.

The Company’s Responsibility

The Company is responsible for the preparation of the Indicators in accordance with its own reporting criteria (the “Company’s reporting criteria”), as described in the Report.

Our Responsibility

Our responsibility is to express a limited assurance conclusion on the Indicators based on the procedures we have performed. We conducted our engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000, Assurance Engagements other than Audits or Reviews of Financial Information and the ISAE 3410, Assurance Engagements on Greenhouse Gas Statements issued by the International Auditing and Assurance Standards Board. The limited assurance engagement consisted of making inquiries, primarily of persons responsible for the preparation of information presented in the Report, and applying analytical and other procedures, and the procedures performed vary in nature from, and are less in extent than, a reasonable assurance engagement. The level of assurance provided is thus not as high as that provided by a reasonable assurance engagement. Our assurance procedures included:

- Interviewing the Company’s responsible personnel to obtain an understanding of its policy for preparing the Report and reviewing the Company’s reporting criteria.
- Inquiring about the design of the systems and methods used to collect and process the Indicators.
- Performing analytical procedures on the Indicators.
- Examining, on a test basis, evidence supporting the generation, aggregation and reporting of the Indicators in conformity with the Company’s reporting criteria, and recalculating the Indicators.
- Visiting the Company’s Daikoku Works Katsushika Area selected on the basis of a risk analysis.
- Evaluating the overall presentation of the Indicators.

Conclusion

Based on the procedures performed, as described above, nothing has come to our attention that causes us to believe that the Indicators in the Report are not prepared, in all material respects, in accordance with the Company’s reporting criteria as described in the Report.

Our Independence and Quality Control

We have complied with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which includes independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. In accordance with International Standard on Quality Control, we maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

KPMG AZA Sustainability Co., Ltd.
Tokyo, Japan
October 9, 2020

Awards Received in FY2019

<table>
<thead>
<tr>
<th>Award name</th>
<th>Sponsor</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent Partnership</td>
<td>Panasonic Corporation</td>
<td>Adoption of high workability white color VIEWKOTETM™ for residential-use downlight fixtures (Nippon Steel)</td>
</tr>
<tr>
<td>Equipment Supplier of the Year</td>
<td>Royal Dutch Shell Group</td>
<td>Continued high performance in terms, including: high-grade product development, achievement of 90%+ on-time delivery, cost reduction across the entire supply chain, and joint development of 2+ projects (Nippon Steel, Sumitomo Corporation)</td>
</tr>
<tr>
<td>Named Top 5 Global Innovator (the only steel company for the eight consecutive year)</td>
<td>Clarivate Analytics (USA)</td>
<td>Awarded as one of the world's most innovative companies by analysis of the trend in intellectual property and patents (Nippon Steel)</td>
</tr>
<tr>
<td>Number of employees</td>
<td>118 equity-method affiliates</td>
<td>408 consolidated subsidiaries</td>
</tr>
<tr>
<td>Corporate profile</td>
<td>(as of March 31, 2020)</td>
<td>Name: Nippon Steel Corporation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Head office: 2-6-1 Marunouchi, Chiyoda-ku, Tokyo 100-8071, Japan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establishment: April 1, 1950</td>
</tr>
<tr>
<td></td>
<td></td>
<td>President: Ei Hazimoto</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capital: 419,524 million yen (439,491 shareholders)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of employees: 106,599 (consolidated)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group companies: 408 consolidated subsidiaries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>118 equity-method affiliates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nippon Steel Corporation Contact: Environment Division TEL: +81-3-6867-2566 FAX: +81-3-6867-4999 Or go to the “Contact Us” page of Nippon Steel’s website: <a href="https://www.nipponsteel.com/en/contact">https://www.nipponsteel.com/en/contact</a></td>
</tr>
</tbody>
</table>

Corporate profile

Nippon Steel Corporation

The central triangle in the logo represents a blast furnace and the people who create steel. It symbolizes steel, indispensable to the advancement of civilization, brightening all corners of the world. The center point can be viewed as a summit, reflecting our strong will to become the world’s leading steelmaker. It can also be viewed as depth, with the vanishing point representing the unlimited future potential of steel as a material. The cobalt blue and sky blue color palette represents innovation and reliability.

©2020 NIPPON STEEL CORPORATION. All rights reserved.