Corporate Philosophy

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.
Steel for All of Us and Earth

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, easy to procure, and sustainable material

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 into various products, such as steel scrap from vehicle bodies being recycled into bridges and buildings.

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 is for here and 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.

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.

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

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

The Life Cycle Assessment (LCA) is therefore important.

Comparison of CO2 emissions in manufacturing for same vehicle component

<table>
<thead>
<tr>
<th>Material</th>
<th>Conventional steel</th>
<th>High-strength steel</th>
<th>Aluminum</th>
<th>Carbon fiber reinforced plastics</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO2 emissions/kg</td>
<td>223</td>
<td>169</td>
<td>851</td>
<td>990</td>
</tr>
<tr>
<td>Functional equivalent single kg</td>
<td>100</td>
<td>75</td>
<td>67</td>
<td>45</td>
</tr>
<tr>
<td>Weight of greenhouse gas equivalent</td>
<td>2.2</td>
<td>2.3</td>
<td>12.7</td>
<td>22.0</td>
</tr>
</tbody>
</table>

Based on the public data of Ohsaka Steel

BF and EAF routes of steelmaking compared using 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 steel scrap in an electric arc furnace (EAF) to make steel. However, the BF route creates steel products that generate scrap that, through recycling, has an effect of CO2 emission reduction. As that scrap recycling effect offsets the CO2 emissions in the BF process, 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 JIS Q 20915. As an example, the amount of CO2 emission in making 1 kg of hot-rolled steel is about 2 kg in the BF route and 0.5 kg in the EAF route. However, incorporating the recycling effect, the total amount of CO2 emission is about 0.7 kg 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.
History of Our Development and Vision in the Future

Nippon Steel has been growing as a global leading steelmaker for many decades, overcoming crises many times. Our aim is to advance toward “the best steelmaker with world-leading capabilities” by incorporating a diversity of DNAs of people and companies and taking up the challenges of making major reforms, which can be described as the second foundation of the company, to achieve further global growth. While providing products and solutions that contribute to world growth, we strive to enhance corporate value and also contribute to realization of the United Nations Sustainable Development Goals (SDGs).

World crude steel production

Source: Worldsteel (up to 2018); JISF (from 2018)

Global trend surrounding the steel industry

Global business development (main cases)

What Nippon Steel has accomplished

• Among the first in Japan to build integrated steelworks to realize efficient imports of raw materials and production and shipment of raw materials
• Being the frontrunner in the world in automation of steelmaking lines and technologies in energy saving and high-quality steel production
• Moved faster than competitors in overseas expansion, technological cooperation to other countries, and establishment of alliances and JVs with overseas major steelmakers
• Ensured the trust and credibility in society with our history, tradition, and a wealth of human resources who have high worldwide capabilities
• Developed Steelmaking, Engineering & Construction, Chemicals & Materials, and System Solutions businesses, generating mutual synergies

Crude steel production (consolidated-base) (million tons/yr)

External environment and issues to be addressed

Promotion of energy saving, higher quality, higher grade steel products

Cooling and business diversification, then streamlining, such as for restructuring in response to the strong zero-carbon emission and the taxable burden

Domestic industry consolidation, promotion of optimal production networks and global business development

Key factors to support growth

• Products and solutions that contribute to sustainable growth
• A supply framework amenable to global growth
• Implementation of advanced IT

Globally, continuously growing Nippon Steel

• Contributing to sustainable global growth on the strengths of advanced technologies, products and solutions, a wealth of human resources, manufacturing capabilities, a global supply network, and trust and credibility accumulated as a responsible leading company
• Taking up a challenge in the area of superinnovative technologies toward the JISF’s goal of realizing “zero-carbon” steel
• Rebuilding our “strength in manufacturing” in our mother mills in Japan, building and maintaining optimal production systems, enhancing “strength in sales and marketing,” and grow in the world as the “best steelmaker with world-leading capabilities”
Nippon Steel Group’s Businesses

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**

¥247.0 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; organic EL materials; 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 diverse carbon-related original products. Based on materials resins, circuit board materials and organic EL materials, in addition to semiconductor and electronics, industrial basics, and environmental and energy area.

**System solutions business**

¥267.5 bn
Nippon Steel Solutions Corporation

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

**Steelmaking and steel fabrication business**

¥5,454.5 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 stainless steel) to many customers in Japan and overseas.

**Engineering and construction business**

¥356.7 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; information steel structures; building construction and steel structures; and pipelines.

The Nippon Steel Group’s overseas business is expanding to the extent of having a global supply network of 21 million tons in downstream processing capacity of steel, mainly for use in the three areas of automobiles, resources and energy, and infrastructure.
Value Creating Process

Using its financial/non-financial assets and competitive business model, which have been revised and improved over a substantial period, Nippon Steel provides products and solutions that address climate change issues and other needs of society. The company thereby contributes to achieving sustainable development goals (SDGs) benefiting society, raises its sustainable growth, distributes profits, and strives to secure its position as a best steelmaker with world-leading capabilities now and in the future.

**INPUT**

**Financial and Non-Financial Capital**

<table>
<thead>
<tr>
<th>Human capital</th>
<th>Number of employees (consolidated)</th>
<th>105,800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual capital</td>
<td>R&amp;D staff (non-consol.)</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>R&amp;D expenses</td>
<td>¥250 bn</td>
</tr>
<tr>
<td></td>
<td>Patents (non-consol.)</td>
<td>15,000</td>
</tr>
<tr>
<td></td>
<td>Overseas</td>
<td>17,000</td>
</tr>
<tr>
<td>Manufacturing capital</td>
<td>Steelmaking facilities' Tangible fixed assets</td>
<td>¥13 tn</td>
</tr>
<tr>
<td></td>
<td>Crude steel production (consol.)</td>
<td>40.2 mn tons</td>
</tr>
<tr>
<td></td>
<td>Global production capacity</td>
<td>90 mn tons</td>
</tr>
<tr>
<td>Natural capital</td>
<td>Iron ore</td>
<td>58.61 mn tons (FY2018 imports)</td>
</tr>
<tr>
<td></td>
<td>Coking coal</td>
<td>25.19 mn tons (FY2018 imports)</td>
</tr>
<tr>
<td></td>
<td>Industrial water (Makeup water)</td>
<td>640 mn m³ (FY2018 makeup volume)</td>
</tr>
<tr>
<td>Social capital</td>
<td>Partnership with communities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relationship with customers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alliance with major steelmakers (ArcelorMittal, etc.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social credibility (Kaisenn, warabi, Nosif, etc.)</td>
<td></td>
</tr>
<tr>
<td>Financial capital</td>
<td>Total assets</td>
<td>¥8.0 tn</td>
</tr>
<tr>
<td></td>
<td>Equity attributable to owners of the parent</td>
<td>¥3.2 tn</td>
</tr>
<tr>
<td></td>
<td>Interest-bearing debt</td>
<td>¥2.3 tn</td>
</tr>
</tbody>
</table>

**BUSINESS MODEL**

The Steelmaking and Fabrication Business and three other business segments generate synergies that create extraordinary strength.

- The Steelmaking and Fabrication Business
- Chemicals & Materials Business
- Engineering & Construction Business
- System Solutions Business

**The Steelmaking and Fabrication Business**

- Abundant human resources
- Advanced technology
- Extensive products
- A joint development relationship with customers
- History and traditions

- No. 3 in the world in production output (FY2018)
- Contribute to the environment (Three E’s: Environment, efficiency, economy)
- Global partnership

**Output**

**Products & solutions**

- **ECO PRODUCTS**
  - Steelmaking and Fabrication Business
  - Chemistry & Materials Business
  - Engineering & Construction Business
  - System Solutions Business

**OUTCOME**

**Contribution to SDGs in society**

- Jobs for employees (incl. subcontractors) and growth in community
- Safe, reliable living (road/sea/key sites, ports, railway, bridges, buildings, etc.)
- Energy preservation, climate action, recycle-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

**Creation of sustainable corporate value and profit distribution**

- Around 10% in ROS
- Profit distribution
- Payout ratio
- Around 30%
- Investment for further growth (2020 Plan)
  - Domestic Capex (consol.) ¥700 bn/5 years
  - Business investment (consol.) ¥600 bn/5 years
  - New hires (non-consol.) Around 1,100/year
- Enhancement of corporate value
  - ROE of around 10%
  - D/E ratio of around 0.7

**Aim at becoming the steelmaking industry’s No. 1 in market cap**

- Ten percent`
Message from the President

Towards the Realization of a Sustainable Society (SDGs)

We have made a new start since April 1, 2019 when we renamed our companies from Nippon Steel & Sumitomo Metal Corporation to Nippon Steel Corporation. As the first president of Nippon Steel, I am determined to do our best to further enhance the strength of our workplaces, based on our manufacturing processes accumulated in Japan, and reform ourselves in this “second foundation stage,” with an ultimate goal of prevailing as the best steelmaker with world-leading capabilities.

In the midst of heightened interest in the United Nations' Sustainable Development Goals (SDGs) and Environmental, Social and Governance (ESG) investments, we, the Nippon Steel Group, find it extremely important that we promote business activities that contribute to the realization of a sustainable society. This is also one of major initiatives of our 2020 Mid-Term Management Plans. In this Sustainable Report 2019, we are pleased to present our wide-ranging initiatives in regard to the Environment, Social, and Governance 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. We 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.

We particularly recognize climate change issues as a grave challenge that threatens humanity. We are therefore contributing to these issues with our “Three Ecoc” initiatives and “Innovative technology development.” The “Three Ecoc” consist of Eco Process (taking up the challenge of further improving our already global-high energy efficiency during manufacturing stage for CO2 emission reduction), Eco Products (demonstrating energy-efficiency performance as final products made of steel materials, such as weight reduction), and Eco Solutions (disseminating our environmental technologies overseas and contributing to global environmental improvement). Our “Innovative technology development” is aimed at providing advanced technologies and products that contribute to both preservation of resources and materials and reduction in environmental impact from the mid- to long-term perspective. We believe that these initiatives can be an effective response to climate change risks as well as creation of opportunities. We are therefore eager to contribute to the global environment by continually reducing environmental impact in steel production and by offering our superior products and technology in Japan and overseas for use by others.

In November 2018, the Japan Iron and Steel Federation formulated a long-term vision for climate change mitigation, “A challenge towards zero-carbon steel.” As a core company in this endeavor, we are taking up the challenge in developing hydrogen reduction steelmaking technology, which enables zero CO2 emission during steelmaking. We are also promoting the “Creation of Sea Forests” and “Blue Carbon” (the carbon captured and stored by oceans and coastal ecosystems) and the development of technology to recycle and convert CO2 to materials for plastics and fuel. Bold attempts to non-continuous innovations are also a part of our efforts. Further, in May 2019 we signed a statement of support for the Task Force on Climate-related Financial Disclosures (TCFD). We are thus committed to expanding information disclosed on the impact of climate changes as well as on our initiatives related to sustainability issues. One aspect of this is how it can enhance our corporate value.

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. In this connection, recycling systems for steel have already been established and steel is a material from which impurities can be easily removed and which can be endlessly recycled without causing deterioration in quality. Based on the concept of Life Cycle Assessment (LCA) that evaluates environmental impact of steel products over their whole life cycle, steel is a perfect embodiment of a circular economy, being a sustainable material with less environmental impact than many other materials. Recently, the method of evaluation of environmental impact over a whole life cycle has been standardized for certification by both the International Standards Organization and Japanese Industrial Standards. This kind of LCA concept is expected to become more common in the future. 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 contribute to realize a circular economy with further technological innovations.

Concerning maintenance and improvement of the living environment in community, what we focus on is 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 impact. Moreover, we actively promote preservation of biodiversity, through the creation of hometown forests in each steelworks and participation in environmental preservation activities in each community.

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 prevail as a company that helps solve diverse social issues through its business activities.

Undoubtedly, support of our stakeholders is indispensable in our 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. In accordance with the concept of maintaining harmony with local communities, 12 steelworks and research centers are enhancing various initiatives in their respective community, in addition to the corporate-wide initiatives. We are thereby actively working on fulfilling our social responsibilities.

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 have established a corporate governance structure appropriate for the Group’s business and important managerial matters are discussed at the Corporate Policy Committee and then decided at the Board of Directors meetings. ESG initiatives, including environmental and social initiatives, as well as enhancement of governance, are considered 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 principles, values, 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.

Eiji Hashimoto
Representative Director and President

NIPPON STEEL CORPORATION Sustainability Report 2019
Materiality KPIs and status of major initiatives

### Materiality KPIs

**Materiality**

- **Key Performance Indicator (KPI)**
- **Major Initiatives and Achievements in FY2019**
- **Page**

<table>
<thead>
<tr>
<th>Materiality</th>
<th>Key Performance Indicator (KPI)</th>
<th>Major Initiatives and Achievements in FY2019</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety, environment, and disaster prevention</td>
<td>Excellent frequency rate of 0.1% or less in three years</td>
<td>Prevention and risk reduction of accidents, based on safety risk evaluation</td>
<td>p. 43</td>
</tr>
<tr>
<td>Environmental impact</td>
<td>Implementation of “Eco Process”</td>
<td>Prevention of air pollution, greenhouse gases, and PM emissions as well as energy efficiency</td>
<td>p. 38</td>
</tr>
<tr>
<td>Environment</td>
<td>Renewable energy utilization</td>
<td>Renewable energy utilization, and promotion of low carbon activity</td>
<td>p. 39</td>
</tr>
</tbody>
</table>

### Status of Major Initiatives

1. **Financial #1: Profit**
   - Profit margin: 7.2% (FY2019)
   - Implementation progress: 75% (FY2019)
   - Challenges: Meeting the target profit margin

2. **Human Resource #1: Human Resources**
   - Employee satisfaction: 85% (FY2019)
   - Implementation progress: 81% (FY2019)
   - Challenges: Enhancing employee engagement

3. **Social #1: Social Issues**
   - Social responsibility: 85% (FY2019)
   - Implementation progress: 85% (FY2019)
   - Challenges: Addressing social issues

### Process to identify materiality

**Step 1:** Consider requests from stakeholders on 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 Board of Directors meeting
Nippon Steel Group’s Contribution to SDGs

Steel contributes to make our life more convenient and pleasant, by being used everywhere in our life and society, and as an indispensable part of resilient infrastructure against natural disasters caused by earthquakes, abnormal weather driven by climate change, and other factors. Steel is also an indispensable material element for achieving SDGs, as it helps reduce environmental impact due to its weight reduction, extension of its product life, etc. 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, sustainable measures so as not to waste resources. These measures include use of by-product gas generated in steelmaking as measures against climate change. We also promote environmental impact due to its weight reduction, extension of its product life, etc. on top of being abundantly available and able to be recycled.

Examples of specific initiatives

- Job creation through establishment of operating companies in emerging countries
- Reduction of vulnerability to disaster based on use of Unique Name Method (construction method to stabilize slopes without damaging the natural environment)
- Use of converter slag as fertilizer to improve farming productivity and soil damage in farmland
- Provision of titanium and stainless steel, which have excellent seawater corrosion resistance, for seawater desalination plants, ensuring agriculture water productivity and salt damage in farmland
- Promotion of employee training to raise skills (i.e., G.E.T., Off-J.T., sending trainees to Junior College for Industrial Technology, hosting technology platforms)
- Study sessions for teachers, internship for students
- Development and provision of steel products that contain substances of concern such as lead and hazardous chromium
- Development and provision of steel materials for high-pressure hydrogen to support a hydrogen-oriented society
- Provision of materials for fuel cells that produce energy from hydrogen
- Efficient use of energy, such as 100% use of by-product gas
- Full recycling of by-products, including slag, dust, and sludge
- Promotion of recycling of waste plastics and waste tires
- Use of steel slag in road materials and materials for civil engineering
- Use of converter slag fertilizer, a by-product of steelmaking, to improve farming productivity and soil damage in farmland
- Provision of various indispensable Ecos Products for daily lives
- Provision of earthquake-resistant steel products
- Development of Nonframe method, which protects houses from disaster while maintaining views of nature
- Development of Eco Products, such as high-tensile, lightweighted, energy-efficient steel sheets and light-weight railway wheels and rails for high-speed railways
- Provision of Eco Products that offer the world’s highest-level energy efficiency
- Regeneration of seaweed beds with the use of steel slag
- Provision of materials for fuel cells that produce energy from hydrogen
- Development and provision of steel materials for high-pressure hydrogen to support a hydrogen-oriented society
- Site cleaning activities around steelworks
- “Creation of Hometown Forests” to promote greenery within steelworks
- Promotion of air, water, soil risk management and chemical substance management
- Development and provision of Eco Products, such as high-tensile, lightweighted, energy-efficient steel sheets and light-weight railway wheels and rails for high-speed railways
- Site cleaning activities around steelworks
- “Creation of Hometown Forests” to promote greenery within steelworks
- Health education programs
- Provision of health management programs for employees
- Enhanced measures to support the work-life balance, such as for the leave system and life support
- Provision of air, water, soil risk management and chemical substance management
- Development and provision of steel products that contain substances of concern such as lead and hazardous chromium
- Development and provision of steel materials for high-pressure hydrogen to support a hydrogen-oriented society
- Provision of various indispensable Ecos Products for daily lives
- Promotion of recycling of waste plastics and waste tires
- Use of steel slag in road materials and materials for civil engineering
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.

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 PRODUCTS** What we produce is “eco-friendly.”

We produce and offer eco-friendly “products” using our world-leading technological capabilities, thus conserving resources and energy and thereby contributing towards building a sustainable society.

**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.

**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 audit)
  - 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 continually 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 comprehensive discussion on environmental risk issues
  - Respond to new environmental regulations

**Raising challenges from the viewpoint of SDGs**

**Sustainable Development Goals (SDGs)**

- Global warming countermeasures
- Environmental management system
- Creation of a recycling-based society
- Environmental relationship activities
- Environmental risk management

**2020 Mid-Term Environmental Management Plan**

- Measures against climate change problems
- Environmental risk management
- Environmental relationship activities

**Nippon Steel’s Environmental Management**
environmental management system

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 audits

In accordance with the international standard ISO 14001, Nippon Steel has built a management system to assess its environmental impact. Its general manager manages the work of the Environmental Management Committee, which is held twice a year, to promote improvement of management. Positioning environmental risks as management issues, we have deployed a procedure wherein environmental risks, related to climate change, air, water, and waste (among others) are given attention by the Board of Directors and the Management Committee. As a part of the Environmental Management Committee and subsequent report to the Environmental Management Committee, 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.

Nippon Steel routinely follows the management cycle of PDCA, primarily through the work of the Environmental Management Committee, which is held twice a year, to promote improvement of management. Positioning environmental risks as management issues, we have deployed a procedure wherein environmental risks, related to climate change, air, water, and waste (among others) are given attention by the Board of Directors and the Management Committee. As a part of the Environmental Management Committee and subsequent report to the Board of Directors and the Management Committee, 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 conference participated in by group companies

From the group companies in Japan, Nippon Steel has identified 58 companies (as of March 2018) having certain environmental impact and holds meetings for those companies twice a year. In the meetings, the latest trends of environmental laws and regulations are studied, cases of environmental initiatives are reported, and other information is shared with the goal of reducing environmental risks.

Environmental accounting

Philosophy of environmental accounting

Nippon Steel has adopted environmental accounting to be used as guidelines for corporate activities, and to accurately track the environmental costs and effects. The iron and steel industry is an equipment-intensive industry. We have achieved environmental preservation and 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 FY2018, capital expenditures for environmental preservation amounted to 29.1 billion yen in total, or approximately 6% of the company’s capital expenditures. Investment in equipment for environmental preservation of 26.3 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 revetments and quay walls.

Environmental conference participated in by group companies

Promotion and Enhancement of Environmental Management

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Coping with Climate Change

Nippon Steel recognizes climate change as a priority problem that may threaten survival of the human race. Adverse change of the climate may cause serious damage to the global environment. Nippon Steel promotes energy conservation and CO2 reduction throughout the entire supply chain: manufacturing, transportation, and final use of products. Nippon Steel is promoting reduction of CO2 emission from diverse ways, including regenerative burners in reheating furnace; and use of waste plastics as substitute for fossil fuel in steelmaking. Besides, 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 electromagnetics steel sheets. Making these high-function products emits a little more in CO2, but use of these materials contributes to significantly higher emission reduction when used in final products.

Contributing with eco-friendly products

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Promotion of innovative technology development

Nippon Steel’s R&D divisions are engaged in development of innovative technologies as top-down projects in collaboration with universities, public research institutes, and other organizations, for the better future of the earth. In addition to technologies to reduce CO2 emissions, the projects include development of technologies to convert recycled CO2 to raw materials of plastics or fuels, and of technologies to store and utilize CO2 such as projects to extend sea forest development that uses slag and further develop Blue Carbon technology that is effective in absorbing CO2.

Initiatives to achieve the long-term vision for climate change mitigation

As a core member of the Japan Iron and Steel Federation, Nippon Steel played a pivotal role in the development of the Long-Term Vision for Climate Change Mitigation (a challenge towards zero-carbon steel). We have upgraded the COURSE50 project into a SuperCOURSE50 project to take up the challenge of developing hydrogen reduction iron-making which enables zero CO2 emission in iron and steelmaking.

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 initiatives that are used as a long time as construction material for public infrastructure. For example, one such product, for embankments, helps protect communities from flooding or high tidal waves generated by terrestrial rain or a typhoon. 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 roof on the boxed 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 waves.

Work to achieve CO2 emission reduction by raising efficiency in logistics

Out of Nippon Steel’s cargo volume transported over a distance of 500 km and more, 94.7% are transported by eco-friendly train and ship (not by truck carrying). We also try to improve transportation efficiency by using larger vessels (changing from 700 tons 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 began adopting hybrid-type cargo vessels, equipped with lithium-ion batteries.

Major initiatives in raising efficiency in logistics

- Reduce fuel consumption by improving the load capacity of vessels
- Reduce fuel consumption by improving the performance of vehicle engines
- Reduce fuel consumption by improving the aerodynamic shape of the vehicles
- Reduce fuel consumption by improving the driving habits
- Reduce fuel consumption by adding hybrid systems
- Reduce fuel consumption by using alternative fuels
- Reduce fuel consumption by reducing the number of unoccupied trucks
Coping with Climate Change

CO₂ emissions in Scope 3

CO₂ emissions in the value chain are 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. Purchased goods and services</td>
<td>17,270</td>
<td>Amount used of purchased iron ore and coal X [Emissions unit value]</td>
</tr>
<tr>
<td>2. Capital goods</td>
<td>1,417</td>
<td>Amount of capital expenditures X [Emissions unit value]</td>
</tr>
<tr>
<td>3. Utilization of energy-related activities not included in scope 1 and 2</td>
<td>422</td>
<td>Amount of electric power procured and fuel used X [Emissions unit value]</td>
</tr>
<tr>
<td>4. Transportation and delivery (upstream)</td>
<td>756</td>
<td>Transportation distance reported in the Energy Saving Law document X [Emissions unit value]</td>
</tr>
<tr>
<td>5. Waste generated in operations</td>
<td>5</td>
<td>Waste disposed X [Emissions unit value]</td>
</tr>
<tr>
<td>6. Business travel</td>
<td>3</td>
<td>Number of employees X [Emissions unit value]</td>
</tr>
<tr>
<td>7. Employee commuting</td>
<td>12</td>
<td>Number of employees X [Emissions unit value]</td>
</tr>
<tr>
<td>15. Investment</td>
<td>848</td>
<td>Emissions by subsidiaries and affiliates that emit over 10,000 tons X [Emissions unit value]</td>
</tr>
</tbody>
</table>

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

Waste plastics

Using coke ovens at Nippon Steel’s seven steelworks, about 200,000 tons of used plastic containers and packaging collected from general households nationwide are recycled 100%, in compliance with the Act for Promotion of Use of Recycled Resources. This contributes to reduction of about 600,000 tons of CO₂ per year. (p. 35)

Blast furnace cement

Use of blast furnace slag in production of cement enables us to reduce use of limestone and fuel, contributing to reduction of 30% in CO₂ emission per one ton of cement (over 40% reduction compared to ordinary cement production). (p. 34)

Blue carbon

A basic research project was launched on the impact of the carbon capture and storage by using steel slag in Nippon Steel’s initiatives to create sea forests. Our unique marine simulator (test laboratory) is used for this. (pp. 33, 40, 41)

Information disclosure according to recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)

Status of climate changes and actions of the steel industry

- Since 2015 when the Paris Agreement that pledged to advance greenhouse gas emission reduction across the world was adopted, institutions in the international community have been required to seek ways to enable sustainable economic and social growth, while restraining impact on the environment.
- Steel is broadly used in our society as an indispensable material element for social infrastructure and durable consumer goods, such as road, railway, buildings, automobiles, and home electric appliances. This is because steel has outstanding features required in many aspects as a basic material, such as abundance as a resource, cost advantages, diverse features, low environmental impact in the manufacturing stage, and endless capability for recycling into all kinds of durable products, in addition to having ideal features for building of infrastructure.
- Medium- to long-term growth in global steel demand is projected (from 1.62 billion tons in 2015 to 2.68 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).
- In order to achieve goals of the Paris Agreement, the steel industry is required to significantly reduce CO₂ emissions in steelmaking, with an increasing focus on the shift to production by electric furnaces, which have a lower CO₂ emission coefficient than blast furnaces. However, as recognized by international and Japanese industrial standards, namely the ISO and JIS, the environmental impact is essentially the same for steel products made by the blast furnace (BF) route and by the electric arc furnace (EAF) route. This judgment is based on Life Cycle Assessment that incorporates recycling impact. The BF route remains to be indispensable as discussed above and we thus need to establish technology that realizes lower carbon in its use. Moreover, development of ultra-innovative technology that may break through these routes is also desired for realizing the Paris Agreement’s long-term goals.
- In addition to containing CO₂ emission in steelmaking, we are also required to respond to customers’ requirements for lightweight, high-strength materials in the automotive area due to tighter environmental regulations and increase in electric vehicles.

Support for TCFD recommendations and Nippon Steel’s strategies

- Climate-related risks and opportunities could be significant for many companies’ financial positions and the related disclosure could reduce risks of financial destabilization. Because of this, in response to the request from the G20, the Financial Stability Board (FSB) established the industry-led Task Force on Climate-related Financial Disclosures (TCFD or Task Force) to develop climate-related disclosures in December 2015 and the TCFD released its recommendations in June 2017.
- As companies are increasingly required to respond to climate changes and to disclose related information, investors and other stakeholders are increasingly interested in the steel industry’s response to risks, such as (1) potential significant reduction in CO₂ emissions; (2) changing trends of steel users, including the automobile sector (i.e., increase in electric vehicles, shift to non-steel lightweight materials prompted by tightened environmental regulations); and (3) adoption of carbon pricing that leads to an increase in operating cost.
- Given the international community’s commitment to achieving long-term goals of the Paris Agreement, our company signed the statement of support for the Task Force on Climate-related Financial Disclosures (TCFD or Task Force) in May 2019, considering the climate change as one of priorities that the planet is facing today.
- In order to expand information disclosed as recommended by the TCFD, we analyzed two scenarios (2°C scenario and 4°C scenario) for a long-term span to 2050 and after. Specifically, we identified our potential risks and opportunities driven by climate change, considered their significance, and organized their impacts and our initiative options related to them. Please see the following page for details on the TCFD scenario analysis.

Japan’s first lithium-ion battery hybrid cargo ship Utashima goes in service

NS UNITED NAOKI KASHA Ltd. in the Nippon Steel Group launched the Utashima, Japan’s first hybrid cargo ship with lithium-ion batteries, in service in February 2019.

The Utashima, a carrier of steel products for Nippon Steel, is equipped with two types of propulsion engines—a conventional diesel engine and an electric-powered propulsion engine, which is also used as a shaft generator. Diesel engine is used to charge batteries by rotating a shaft generator when navigating on the open sea. Inside areas such as the Tokyo Bay, batteries feed power to an electric propulsion engine. This is an energy-efficient hybrid ship that also enables batteries to be charged from the onshore facility and to be used as a power source in harbor. In addition to reducing CO₂ emissions, use of battery power can improve the working environment of crew by being quieter and generating less vibration than when the diesel engine is used, facilitating the rest and work of crew, and eliminating the work of managing a diesel engine.

The Utashima has been furnished with unique, innovative technologies, contributing to solving diverse issues of vessels on domestic routes, and paving a way to realize the next-generation zero-carbon ship, that is friendly to the global environment and ship’s crew, and contributing to achieving SDGs.

Note: 2°C scenario is a case that much-needed measures will be implemented to keep global average temperature increase below 2°C compared to pre-Industrial Revolution era.

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2 The 2°C scenario is a case that much-needed measures will be implemented to keep global average temperature increase below 2°C compared to pre-Industrial Revolution era.
Coping with Climate Change

TCFD scenario analysis

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Factor</th>
<th>Event</th>
<th>Impact on Group’s Value</th>
<th>Margin (Share)’s Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transition factor 1</td>
<td>Shift to other lightweight materials</td>
<td>Promoted by higher fuel efficiency regulations</td>
<td>Limited impact in demand growth of steel</td>
<td>Limited impact in demand growth of steel</td>
</tr>
<tr>
<td>Transition factor 2</td>
<td>Shift to other lightweight materials</td>
<td>Promoted by higher fuel efficiency regulations</td>
<td>Limited impact in demand growth of steel</td>
<td>Limited impact in demand growth of steel</td>
</tr>
<tr>
<td>Transition factor 3</td>
<td>Shift to other lightweight materials</td>
<td>Promoted by higher fuel efficiency regulations</td>
<td>Limited impact in demand growth of steel</td>
<td>Limited impact in demand growth of steel</td>
</tr>
<tr>
<td>Transition factor 4</td>
<td>Increase in operating cost</td>
<td>Caused by adoption of carbon pricing</td>
<td>Limited impact in demand growth of steel</td>
<td>Limited impact in demand growth of steel</td>
</tr>
<tr>
<td>Transition factor 5</td>
<td>Increase in operating cost</td>
<td>Caused by adoption of carbon pricing</td>
<td>Limited impact in demand growth of steel</td>
<td>Limited impact in demand growth of steel</td>
</tr>
<tr>
<td>Transition factor 6</td>
<td>Increase in operating cost</td>
<td>Caused by adoption of carbon pricing</td>
<td>Limited impact in demand growth of steel</td>
<td>Limited impact in demand growth of steel</td>
</tr>
</tbody>
</table>

The global steel demand is expected to keep increasing along with mid- to long-term growth of the global economy. Steel production therefore is anticipated to expand toward 2050. In addition, the scenario analysis on the left page has clearly identified expanding needs in steel products and solutions that satisfy demand for lighter weight and higher strength in the automotive area as well as demand associated with electric vehicles and more resilient infrastructure building.

We have so far promoted what we call the three ecos, namely, Eco Process, Eco Products, and Eco Solution, as well as undertaking innovative technology development, such as COURSE5. Going forward, we will also focus on challenging ultra-innovative technologies, such as Carbon Capture and Utilization (CCU) and hydrogen reduction steelmaking, with the aim of achieving zero carbon steel and carbon recycling.

By taking these initiatives, we intend to respond to social requests to reduce CO2 emissions and customers’ challenges, while keeping in mind the discussion on carbon pricing. This is our group-wide approach to capture growth opportunities and manage risks. We committed to make advances along with our mid-term management plan which began in 2018 toward becoming the best steelmaker with world-leading capabilities, by strengthening our superiority in technology, cost, and being global and creating the value of steel.

For reference] TCFD’s recommendations and supporting recommended disclosures

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Reference page</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Describe the board’s oversight of climate-related risks and opportunities.</td>
<td>p. 18</td>
</tr>
<tr>
<td>b) Describe management’s role in assessing and managing climate-related risks and opportunities.</td>
<td>p. 18</td>
</tr>
<tr>
<td>c) Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</td>
<td>p. 24</td>
</tr>
</tbody>
</table>

[Environment] Describe how the organization identifies, assesses, and manages climate-related risks.

a) Describe the organization’s processes for identifying and assessing climate-related risks. | p. 18 |

[Governance] Describe how the organization identifies, assesses, and manages climate-related risks.

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[Strategy] Describe the actual and potential impacts of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning where such information is material.

a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term. | p. 24 |

b) Describe the impact of climate-related risks on the organization’s businesses, strategy, and financial planning. | p. 24 |

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

a) Describe the organization’s processes for identifying and assessing climate-related risks. | p. 18 |

b) Describe how the organization’s processes for managing climate-related risks. | p. 18 |

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

a) Describe the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process. | p. 13 |

b) Describe Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks. | p. 20, 22 |

c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets. | p. 13 |

Sources for Scope 1, Scope 2, and Scope 3: Nippon Steel & Sumitomo Metal Mining Co., Ltd., and Nippon Steel Corporation.
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.

As its main 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 88% 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. 90% of water used for cooling and cleaning products and manufacturing equipment is repeatedly re-used.

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, waste tires, 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. p. 35

1 Reduction: Chemical reaction to remove oxygen from an oxide.

Coping with Climate Change

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

Not wasting any energy

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Coping with Climate Change

ENERGY

Input

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<th>Nippon Steel’s share in Japan’s total energy input (FY2017)</th>
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<tr>
<td>Coal</td>
<td>Coke oven gas (By-product gain)</td>
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Blast furnaces are huge reactors, using coal

Iron ore and coal are the main raw materials fed into a blast furnace. Iron ore is melted in a huge furnace (height, about 150 meters) and steel is reduced and extracted, but what kind of role does coal play? The main ingredient of coal is carbon, but before it is fed into a blast furnace, it is thermally decomposed in the absence of oxygen (carboxidized), effective ingredients such as hydrocarbon oil and gas are separately extracted, and it is turned into coke with high strength and high carbon purity. However, the iron included in iron ore is present as iron oxides. In the blast furnace, a chemical reaction called reduction, which removes oxygen from these 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.

At present, as there is no reducing agent to replace coal in the industrial production of steel, the generation of CO2 resulting from the reduction reaction caused by carbon cannot be avoided (iron oxide + carbon → iron + CO2)

However, as the Japanese steel industry, including Nippon Steel, has promoted energy-saving measures such as making effective use of the by-product gases and heat generated in the steelmaking process, it has realized the highest energy efficiency in the global steel industry and at the same time is controlling the CO2 emissions. We may therefore conclude that making steel in Japan is ecologically wise.
Nippon Steel is contributing to environmental risk reduction by providing products that have properties which were previously attained by adding substances of concern, but now without adding any substance, and products that prevent environmental pollution by their use.

- **Negative pressure can**
  - Complies with the Negative Pressure Can Act of the Ministry of Health, Labour, and Welfare (Japan).
  - 33% lighter than a general negative pressure can and over 6% lighter than a conventional low positive pressure can.
  - Developed by Toyo Seikan Co., Ltd. and Nippon Steel.

- **NSafe™-Hull**
  - 65% higher ductility than the regulatory required level for conventional steel, and contributes to preservation of marine environment by preventing oil leakage at the time of a ship’s collision or standing.
  - Developed by Toyo Seikan Co., Ltd. and Nippon Steel.

- **Steel sheet**
  - 90% light-weight than aluminum.
  - Available only from our company.

- **SuperDyna™**
  - Steel sheet that contributes to reduction in life cycle CO2 emissions.
  - Available only from our company.
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 Approach1, 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 the potential to improve energy efficiency. The reduction effects of CO₂ emission by transfer of Japanese steelmakers’ energy-saving technologies have amounted to 62.59 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.

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 includes a technology outline and supplier information. The list was prepared for the purpose of promoting Japan’s energy-efficient technology transfer and is used as a reference in doing assessment of steelworks. In FY2018, the JISF has conducted assessment of 11 steelworks in India and 14 steelworks in six ASEAN countries.

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 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, ISO14001, which specifies calculation methods for the CO₂ intensity of steelworks. Up to FY2018, the JISF has conducted assessment of 11 steelworks in India and 14 steelworks in six ASEAN countries.

Joint meetings of public and private steel-related parties

Joint meetings of public and private steel-related parties have been selected as a Climate Action member. The meetings have been held 9 times in India and 11 times in six ASEAN countries.

The three pillars of collaboration for bilateral energy-saving and environmental co-operation

The three pillars of collaboration for bilateral energy-saving and environmental co-operation with India, Southeast Asia, and other countries and regions.

Coping with Climate Change

ECO SOLUTION Sharing our “eco-solutions”

Technical cooperation and technology transfer promoted on a worldwide scale

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

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

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

The three pillars of international cooperation in energy conservation

1 Global Sectoral Approach is a method to help solve global warming problems by seeking CO₂ reduction potential based on sector-specific technologies and adapting the world’s best energy-saving technologies.

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.

Realizing the world’s top-class energy efficiency

Since the first oil crisis in 1973, Nippon Steel and Japan’s steel industry have intensively invested in technology for better energy conservation in production processing, and in technology to collect energy. Specifically, we promoted innovation in processing, by introducing continuous casting machines and continuous annealing furnaces, and improvement in processing such as direct hot charging and automatic burning control. Regarding energy collection, by-product gas generated in processing of coke ovens, blast furnaces, and other areas have been collected and reused highly efficiently; exhaust heat and exhaust pressure from Coke Dry Quenching (CDQ), regeneration burners, and Top Pressure Recovery Turbines (TRT) have also been collected; and use of waste plastics and other waste substances have been promoted. These steady efforts have led to Japan’s steel industry achieving significant energy conservation and the world’s top-class energy efficiency.

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

Source: International Comparisons of Energy Efficiency (Sectors of Electricity Generation, Iron and Steel, Cement, PET, 2010: The Japanese translation and numeral values were provided by the Japan Iron and Steel Federation.)
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.

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 Oita Works 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 emission reduction

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 clean power generation. Compared to wet quenching, 40% energy saving has been achieved. The first CDQ unit was installed in the Yawata Works in 1976.

CO2 separation and recovery

Commercializing ESCAPE™ (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, 2,2-dimethyl-1,3-propanediol carbonate ester) from CO2, and convert CO2 to fuel and chemicals.

Carbon fixation

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 sequestrate CO2 in farmland.

CO2 recycling

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.

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

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

Technology to incorporate the photocatalytic technology in electrolysis in order to produce hydrogen through electrolyzing water. Use of solar energy enables reduction in use of electric energy.

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

Since 2008, the COURSE 50 has been developing technologies to lower CO2 emissions by 30% and a 10% cut in CO2 emissions from a blast furnace by adopting technologies to 95% or 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 at the Kitakyushu Works and we also undertake 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.

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

Effective use of steel slag

Steel slag is almost entirely utilized. Approximately 70% of blast furnace slag used for cement, while steelmaking slag is used for materials for road bases, civil engineering work, fertilizer, soil improvement, etc. Steel slag is almost entirely utilized. Approximately 70% of blast furnace slag is used as steel slag, dust, sludge, and used refractory bricks are generated for cooling and cleaning of products and manufacturing facilities are reprocessed and repeatedly used.

Recycling of dust and sludge

To recycle the dust and slag generated in the iron and steelmaking processes, for them to be used as raw materials, Nippon Steel operates a dust reduction kiln (RC: Resource-circulating oven) at Kamaishi Works and a rotary hearth reduction furnace (RHF) at Kitakyushu Works, Hitachi Works, and Hankai Works. This enables us to recycle all internally-generated dust. In March 2008, we obtained special approval for RHF under the Waste Disposal Act to carry out recycling of externally-generated dust as well.

Recycling of waste generated by society

Waste plastics

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 hydrogen 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.

By-products and recycling (FY2018)

<table>
<thead>
<tr>
<th>By-product</th>
<th>Annual generation</th>
<th>Recycling application</th>
<th>Recycling rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust</td>
<td>7.7 ton</td>
<td>Coke oven</td>
<td>100%</td>
</tr>
<tr>
<td>Coke</td>
<td>10.4 ton</td>
<td>Coke oven</td>
<td>100%</td>
</tr>
<tr>
<td>Slag</td>
<td>6.2 ton</td>
<td>Coke oven, cement</td>
<td>99%</td>
</tr>
<tr>
<td>Dust</td>
<td>3.8 ton</td>
<td>Coke oven</td>
<td>100%</td>
</tr>
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</table>

Our method of using coke oven gas is an extremely high recycling efficiency and a great treatment capacity, contributing to a circular economy in many regions. The cumulative amount processed in FY2000–2018 was approximately 3.07 million tons, equivalent to 9.80 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.

Moreover, our plastic recycling plant in each steelworks is open for visits by the public. The Kimitsu Works, being located close to the Tokyo Metropolitan Area, welcomed about 9,300 visitors in FY2018, contributing to environmental education in the community.
Promotion of Environmental Risk Management

Nissan 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), Nissan 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 dust and dust generated from factories and raw material yard, we try to enhance their collection by installing dust collectors and prevent scattering of dust by installing windscreens 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.

In consideration of the importance of preventing water pollution, we have installed devices such as detectors, control valves, and emergency water storage pits. We also strive to check, repair, and maintain equipment in order to prevent water pollution, and to train our personnel in methods of checking of operations and controlling work procedures.

Moreover, our steelworks have taken measures, such as to install a large storage tank so that water tainted with iron ore powder would not directly be released into the sea even if our steelworks were struck by a local torrential rain caused by weather abnormality.

If there is a crack in an embankment facing the sea, there is a risk of a leakage of groundwater with unknown contaminants. In order to prevent this, the embankment is regularly inspected from the sea side to find potential issues. Damaged areas found by inspection are promptly repaired to maintain and manage the embankment in a sound condition.

Nippon Steel uses approximately 6 billion m³ of freshwater a year at all of our steelworks and factories combined. Approximately 90% of this is re-circulated or reused. 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.

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.
Promotion of Environmental Risk Management

Soil risk management
We are taking appropriate measures in compliance with the Soil Contamination Countermeasures Act, guidelines issued by the Ministry of the Environment, local government ordinances, and so on. We report to the local government when performing landform modification work such as excavation which is required to be reported. We conduct soil 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 discharge or disposal of chemical substances in accordance with the PRTR Act, Chemical Substance Control Law, and other laws concerning the management of chemical substances as well as the procedures employed. According to the targets of the PRTR Act, we thoroughly manage the material balance, which includes the amount of chemical substances handled, the amount discharged to the environment, and 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 Control Law, we identify and provide notification of the amounts of production and sales of the targeted chemical substances.

Nippon Steel also took the lead to promote use of alternatives to steelmaking materials and equipment that contain hazardous materials such as polychlorinated biphenyl (PCB) and mercury. We have been replacing or disposing of possibly risky parts and materials, according to safety handling standards.

Management of discharged based on the PRTR Act
In 1999, two years before the enforcement of the PRTR Act, 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 PRTR Act, we monitor 462 chemical substances and try to control their emission and improve the way we manage them. In FY2018, there were 52 target substances for notification and the emission amount was 420 tons into the atmosphere and 59 tons to public water areas, while the disposal amount of mostly manganese, chrome, other metals, and their compounds to outside of the steelworks was 5,307 tons in aggregate. Every year, data is compiled by each steelworks and experience in carrying out reduction measures is shared with other steelworks. In addition, the compiled results are disclosed on our website.

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.

Voluntary priority control of select chemical substances

1. Ozone

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 confirmed 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.

2. 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

Benzene

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
<th>Target</th>
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<td>2003</td>
<td>2,106</td>
<td>1,568</td>
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<tr>
<td>2004</td>
<td>1,751</td>
<td>1,348</td>
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<tr>
<td>2018</td>
<td>99</td>
<td>99</td>
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</tbody>
</table>

In order to appropriately handle industrial waste generated in our business activities, we thoroughly carry out (1) management by sorting industrial waste depending on the status of its occurrence, (2) appropriate selection and continuous management of collectors, transporters, and disposal contractors, and (3) appropriate management of 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 adopted the e-Manifest system and fully utilize it for waste management.

We also evaluate collectors, transporters, and disposal contractors based on our internal rules and conduct site inspections at predetermined frequency, so as to continuously and appropriately ensure proper management.

Appropriate treatment of industrial waste

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Environmental measures taken in steelworks

Reduction in emissions of SOx and NOx

Nippon Steel takes measures to reduce emissions of sulfur oxides (SOx) and nitrogen oxides (NOx). With each local municipality where we make steel, we have entered into an agreement which includes more stringent contents than the total emission control standards stipulated by the Air Pollution Control Act. In order to control the emission amount at lower levels than agreed upon, we have implemented effective equipment-related measures such as using low-sulfur fuel, adopting equipment that reduces SOx and NOx emissions and low NOx generating burners, and installing exhaust gas treatment equipment.

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Coping with water risks

Nippon Steel makes efforts to continuously reduce water usage volume and enhance efficiency in its usage, with the aim of reducing environmental impact.

Our operational bases are spread across Japan. The World Resources Institute (WRI) Aqueduct has evaluated that our steelworks are not exposed to water stress and that only one steelworks is located in a high-risk site. (This steelworks’ water intake volume represents less than 0.1% of our total volume.) Some of our steelworks possess their own water reservoir, in preparation of the remote chance of water intake restriction.

Environmental measures taken in steelworks

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Nippon Steel takes measures to reduce emissions of sulfur oxides (SOx) and nitrogen oxides (NOx). With each local municipality where we make steel, we have entered into an agreement which includes more stringent contents than the total emission control standards stipulated by the Air Pollution Control Act. In order to control the emission amount at lower levels than agreed upon, we have implemented effective equipment-related measures such as using low-sulfur fuel, adopting equipment that reduces SOx and NOx emissions and low NOx generating burners, and installing exhaust gas treatment equipment.

Appropriate treatment of industrial waste

In order to appropriately handle industrial waste generated in our business activities, we thoroughly carry out (1) management by sorting industrial waste depending on the status of its occurrence, (2) appropriate selection and continuous management of collectors, transporters, and disposal contractors, and (3) appropriate management of 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 adopted the e-Manifest system and fully utilize it for waste management.

We also evaluate collectors, transporters, and disposal contractors based on our internal rules and conduct site inspections at predetermined frequency, so as to continuously and appropriately ensure proper management.
“Creation of Hometown Forests” and “Creation of Sea Forests”

As a member of Nippon Keidanren (Japan Business Federation), Nippon Steel participated in preparing the “Declaration of Biodiversity by Keidanren” published in March 2009, and has taken initiatives on biodiversity preservation according to its declaration and action policy. Among them, interesting projects thus far are “Creation of Hometown Forests” and “Creation of Sea Forests,” the world-leading pioneer projects.

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 Miyazaki (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 in a certain area in a nearby grove associated with a historical shrine (Chichi-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.

As of March 2019, we have held the “Creation of Hometown Forests” projects at our factories in 37 locations, and this year we will begin a new project at our Gifu factory. As a result, we have obtained the privilege of using special trees in the shrine grounds of 28 shrines, including the Inamuragasaki Shrine in Hyogo Prefecture.

Some animal inhabitants of the Hometown Forests

- Mammals: Fox, marten, wildcat, badger, weasel, squirrel, raccoon
- Birds: Woodpecker, wagtail, thrush, magpie, black-tailed gull, redshank, raven, barn swallow, barn owl, chough, crow, and more
- Reptiles and amphibians: Lizard, frog, newt
- Insects: Butterfly, ladybug, wasp, grasshopper, dragonfly, cicada, water strider

As a result of these initiatives, Nippon Steel received the Encouragement Award of Japan Greenery Research and Development Center at its 37th National Convention for the Promotion of Factory Greening.

“Creation of Sea Forests”

We began experimental use of the product in Mashike Town, Hokkaido in 2004, continuing development for more than 10 years, and confirmed restoration of a keel seabed and its subsequent preservation. In 2014 the project was expanded to a 30-meter-long coastline. We have confirmed growth of the keel seabed every year as well as an increase in concentration of iron, expansion of seaweed area, and an increase in the number of sea urchins. If we can contribute to sustainable recovery of fishery not only by a restoration of the sea bed but also by returning but also by spawning in the restored keel seabed in addition to sea urchins, and if the desurfaced low-bottom areas can be thus restored, the effort to steadily support bio-diversity can also be anticipated.

Steel slag being used for rice cultivation

Steel slag, a by-product of steelmaking, contains nutritional material that helps grow plants. It is therefore used as a fertilizer for rice cultivation, dry-field farming, and pasture grass. Steel slag 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 farming in the Soma area of Fukushima Prefecture, which was devastated by the earthquakes and tsunami of March 2011. The slag fertilizers has 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.

Tree planting by new employees

In the Kunito Works in Chiba Prefecture, new employees plant trees every year as a part of their environmental education. In FY2018, 208 participants including instructors planted several species of evergreen and broad-leaved trees.

Steelworks’ community contribution activities

Participating in “Creation of a Hometown Forest” in local communities

Nippon Steel’s Amagasaki Works has participated in the Amagasaki 21st Century Forests Project, together with local municipalities, companies, and NGOs, under Hyogo Prefecture’s greening promotion project, since FY2016. By FY2017, the reforestation area reached 14,526m², exceeding the size of the grounds of the Yokohama Stadium. The Amagasaki Works endorsed the concept of a newly-added “large-scale urban greening promotion business” in Hyogo’s project and planned to make a green space of over 1,000m², at the time of celebrating its 100th anniversary in September 2019.

Due to these initiatives, Nippon Steel received the Encouragement Award on Japan Greene Research and Development Center at its 37th National Convention for the Promotion of Factory Greening.

Participation in ecological preservation activities in the community

Since 2012, the Nagoya Works of Nippon Steel has participated in the Inochi-wo-Tsugau (Life Sustaining) Project, which consists of the students’ planning committee, 11 companies, Eco-Asset Consortium and Japan Ecological Association of Support (NGO). 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 Nippon Kogyo Shimbun newspaper, and supported by the Ministry of the Environment.

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“Creation of Sea Forests” began in Mashike Town

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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 (OSHMS) 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.

Under the OSHMS, we make policy, define targets, and develop a plan for the safety and health policy, implement a PDCA cycle, and drive continuous improvement. We are now considering obtaining the ISO (JISQ) 45001 Health and Safety certification (published in March 2018) for all our workplaces. At present, about 40% of our offices and works have obtained OSHMS certification by a third party.

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 continuous execution of these measures, safety improved in FY2018. There were 10 accidents for Nippon Steel’s employees1 and 10 for employees of subcontracting companies (including one fatal accident for Nippon Steel and two in subcontracting companies). The accident frequency rate was 0.10 (compared to Japan’s steel industry average of 1.16) and the accident severity rate was 0.11 (vs. 0.21). We will continue to strive for a safe work environment with the safety wellness targets for FY2019 that are zero fatalities/severe accidents and less than 0.10 as the accident frequency rate.

Target

Accident frequency rate 0.10 or less
Zero fatalities accidents

Safety training

We make efforts to improve training for accident prevention. The safety training programs are attended by all newly-appointed managers of manufacturing workplaces (108 managers in FY2017 and 91 in FY2018). Our TAIKON Program (an experience-based safety education program) allows employees to experience worksite risk through simulation, so as to better prepare them in anticipating and managing risk.

Safety and Health Management System (OSHMS)

Implementation of the safety and health plan
Audit of the system
Everyday checks and making of improvements
Planning internal evaluation, system review
Declaration of the basic philosophy on safety and health
Risk assessment
Setting up targets
Planning internal evaluation, system review
Implementation of the safety and health plan

Disaster Prevention Initiatives

In November 2014, we established the Plant Safety Division, with the objective of promoting essential disaster prevention improvement measures in manufacturing sites for solving challenges related to disaster prevention risks. The following three areas remain to be the focus in promoting the activities.

Three initiatives for risk reduction in disaster prevention

- Corporate-wide implementation of measures against risks that emerge from instances of disaster, to prevent recurrence
- Identification of disaster occurrence risks based on risk assessment plant by plant and by each of their process technology divisions; and implementation of measures in software and hardware to reduce risks and control residual risks
- Voluntary monitoring (auditing) concerning appropriate implementation of points 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

Specific disaster prevention initiatives

- Prevention of disaster recurrence (mitigating risks exposed by disaster)
  - Enhance crisis-related measures (pilots at all plants in all workplaces; enhanced drill programs)
  - Improve the fire-fighting capacity of the in-house fire-defense function, in cooperation with experts (the fire-fighting with public fire fighters; training for leaders, etc.)
  - Preventing targeting past incidents and accidents (given presentations in training facilities: session to learn about past incidents during training)
- Disaster prevention risk assessment (identification of new potential disaster risk)
  - Identify and assess risks in manufacturing sites; manage residual risks; promote drafting of permanent measures
  - Identify accident-related risks related to operating processes and facility design and promote the drafting of permanent measures by outside experts and the process technology division in the head office
- Measures to mitigate existing risks (measures for disaster prevention equipment)
  - Prevent disaster recurrence; investment in measures for compliance and risk assessment (about ¥50 billion/year)

Compliance (internal control)

Enhancement of the level of disaster prevention risk management

Compliance with laws and regulations; response to ministries and agencies

Auditing concerning disaster prevention

- Voluntary monitoring by disaster prevention organization at each plants 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 plants based on the findings in the head office
- Measures against earthquakes and tsunami
  - Promote measures in order of 1) human damages prevention, 2) area damage prevention, and 3) production measures
  - Develop policy to address situations when a Tsunami occurs; training for workers and others for the setting of protective actions
- Third-party monitoring toward enhancing safety competency in the steelworks
  - Assessment of steelworks by an NGP, the Japan Safety Compania Center
- Group companies disaster prevention management
  - Meeting to enhance coordination for disaster prevention management; visits to a plant where a disaster/accident happened
Toward More Stable Production

Nippon Steel has been implementing diverse measures for restoring strength in manufacturing to make production more stable. In the recent several years, however, reduced production, caused by problems, continued and the level of crude steel production were depressed at the 41 million ton level in FY2018 (on a non-consolidated basis). Measures were taken and we continue to do what is needed to improve the situation.

Working for stabilizing production (restoring strength in manufacturing)

Measures in hard aspects

1. Yawata Works: Start operation of a leading-edge continuous casting facility. A blast furnace and steelmaking facility in the Kokura area of the Yawata Works is planned to be closed by around the end of FY2020.
2. Wakayama Works: Switch from the No. 5 BF to the new No. 2 BF to increase annual crude steel production capacity by 0.5 million tons, and suspend operations at an electric arc furnace of Nippon Steel Structural Shapes Corporation located within the Works by around the end of FY2019.
3. Kimitzu Works: A small-diameter seamless steel pipe & tube mill will be shut down by around May 2020. Production will be consolidated at the Kitayama area of the Wakayama Works.
4. Kashima Works: A UO steel pipe mill will be shut down by the end of October 2019. Production will be consolidated at the UO steel pipe mill in the Kimitzu Works.
5. Coke oven (CO) refurbishment: Kimitzu No. 5 CO, Muroran No. 5 CO, and Nagoya No. 5 CO.

Measures in soft 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 those 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.

In addition, we strive to enhance the managerial ability of line managers in operation (doing so through human resources development activities) and to implement smart workstyles consistent with becoming the world’s best steelmaker with world-leading capabilities.

Activities by corporate-wide experts

We strive to use insights and know-how of experts in the group to promptly solve specific issues, such as related to capital expenditures and operational or facility issues. Experts who have advanced knowledge and experiences in processing or element technologies are being mobilized for work beyond organizational or area-based boundaries.
**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 management, with the aim to deepen the partnership for enhanced manufacturing competitiveness and to promote purchasing that contributes to a more sustainable society. Under the policy, we strive to enhance risk management of the entire supplier chain by undertaking more initiatives, such as ESG initiatives (including the enhancement of governance structure), survey on minerals from conflict-affected and high-risk areas, and business continuity planning (BCP). In addition, we began to compile a Partner Questionnaire to survey suppliers once a year. The Partner Award System has also been implemented to express our gratitude to suppliers who have greatly contributed to our advancement in manufacturing competitiveness.

**Supply chain management that reduces environmental impact**

Based on the Life Cycle Assessment concept, Nippon Steel is taking initiatives in reducing environmental impact at various points along the supply chain. In keeping with rising demand for tighter management of chemical substances, we have created management standards for 16 toxic chemical substances, including cadmium, jointly with customers and suppliers. We then established a system to manage substances of concern contained in purchasing materials and products, including packaging materials. In addition, as stipulated in the Charter of Corporate Behavior by Keidanren, we have set up internal rules, including an appropriate purchasing policy, which puts us on record as fully considering resource protection and environmental preservation.

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 NGO, we have taken the initiative in developing a framework to prioritize the purchasing of products and services that represent less environmental load.

**Basic policy**

- Compliance with laws
- Equal opportunities
- Building of a partnership
- Fair disclosure of information and quick transaction processing
- Consideration to resource protection and environmental preservation
- Preservation of confidentiality

**Respect for human rights and promoting diversity & inclusion**

**Respect for human rights**

In compliance with the Universal 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 have also prohibited 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 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 whistleblowing 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 whistleblowing 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.

**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 composes 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 hours worked, and to keep the time worked at a suitable level. This is done with cooperation by labor unions. As a part of initiatives on Work Style Innovation, we are expanding the working system from the viewpoint to fully utilize the optimized work time and to allow all employees use their full capacity. In FY2019 we began a telework program. We also provide both diverse welfare programs to support employees’ personal life and numerous measures for individual departments depending on their business conditions, such as to setting a non-overwork day.

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).

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.

In addition to implementing a childcare leave system which is more generous than legally required, a rehiring program for employees who previously left the company for child or elderly care and other reasons, and a leave program to assist overseas relocation of the spouse, we opened 24-hour childcare centers for use by shift work employees in previously left the company for child or elderly care and other reasons, and a leave program to assist overseas relocation of the spouse, we opened 24-hour childcare centers for use by shift work employees in

Achievement related to balance in work-life

The ratio of paid holidays taken (result in FY2019) 77.5%

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 by using a skill map – a list of skills for each individual, and confirmed or modified as needed. Off-the-job training includes training by career level and length of service, and designated training by role of work.

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.

Securing of personnel

Nippon Steel carries out fair and impartial hiring activities, based on the Keidanren (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.

Initiatives for Human Resources Development

(2) Utilization and development of human resources

Personnel development policy

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<table>
<thead>
<tr>
<th>Status of employees (unconsolidated basis)</th>
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<tbody>
<tr>
<td>Number of employees</td>
</tr>
<tr>
<td>No. of new hires</td>
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<tr>
<td>Average years of service</td>
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<td>Rate of voluntary termination</td>
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</table>

Utilization and development of human resources

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

Nippon Steel School (name for education targeted young employees)

Number of training/learning hours (FY2018)

1.5 million hours/year (56 hours/year per employee)

Objective

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

Respect for human rights and promotion of diversity & inclusion

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

Diversity & inclusion

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.

Achievement related to diversity & inclusion

<table>
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<tr>
<th>Achievement related to childcare support system (result in FY2018)</th>
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<tbody>
<tr>
<td>The ratio of women in overall hiring (Average ratio from FY2017 to FY2018)</td>
</tr>
</tbody>
</table>

Office staff and engineers 34%

Operators and maintenance personnel 17%

Overall hiring 23%

Number of women in managerial positions (as of April 2019) 97

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 (FY2017) 3,041

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

Number of new hires (number of women in parenthesis) 26,570 (2,406) (March 31, 2019)

Number of new hires (number of women in parenthesis) 1,108 (281) (FY2018)

Number of new hires 26,570 (2,406) (March 31, 2019)

Number of new hires 1,108 (281) (FY2018)

Average years of service 15.1 years (March 31, 2019)

Rate of voluntary termination 1.7% (FY2018)

NIPPON STEEL CORPORATION Sustainability Report 2019
(3) 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, it promotes health promotion measures with a focus on disease prevention. Specifically, the company is committed to providing a full health checkup menu and enhanced aftercare 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.

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 checkups 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. As measures against cancer, cancer screening tests are broadly included in checkup items, depending on age and gender. In 2018, screening for breast cancer and uterine cervix cancer were included for female employees of all group companies.

Mental wellness

Aiming for each employee to enjoy a robust life on and off the job, we provide a counseling service for prevention and early detection in the area of mental health, and have incorporated the issue of mental health into the checkup menu, depending on age and gender. Aiming for each employee to enjoy a robust life on and off the job, we have incorporated the issue of mental health into the checkup menu, depending on age and gender.

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 workplace
  - Employees
    - Receive a medical check-up
    - Check the result
    - Try to make improvement
      - Receive Health Promotion and Treatment
    - Check any change in the next medical check-up
  - Company
    - Support wellness of subordinates
      - Understand their health condition
      - Receive a medical check-up
    - Health promotion department
      - Nippon Steel
        - Health promotion department
        - Health promotion staff
        - Occupational health insurance
      - Committee of health promotion
      - Labor-management council
      - Management committee for the whole company
    - Committee of health insurance
      - Nippon Steel Health Insurance Society
      - Nippon Steel Workers’ Union

Organization chart for health promotion

Providing education on manufacturing and the environment

- Support of community-based education
  - Nippon Steel has been engaged in unique community-based environmental education support programs and educational activities on "mori wa umi no koibito" — Japan’s indigenous ironmaking technique — at our steelworks and factories. Our employees at Oita Works also gave a "travelling scientific lecture" at local primary and secondary schools. Nippon Steel's Head Office staff took part in an Energy and Environmental Workshop held by a junior high school in Kanagawa Prefecture, showing an example of use of waste plastics at Nippon Steel to demonstrate the steelmaking industry's environmental initiatives. In addition, we 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 the basics about why disasters happen and what appropriate actions to take when one occurs.
  - Training programs for educators at private companies
    - Every summer we support the "Training Programs for Educators at Private Companies" sponsored by the Japan Institute for Social and Economic Affairs, so that teachers can better understand how the steel industry is contributing to society and can better appreciate the fascination of product-manufacturing. In 2018, we hosted 126 teachers for the tours of our facilities and our human development activities.

Demonstrating the joy of product-manufacturing through "Tatake Ironmaking"

With the aim of showing children the joy of product-manufacturing, Nippon Steel has been holding demonstrations on "tatake ironmaking" — Japan’s indigenous ironmaking technique — at our steelworks and nearby schools in Japan every year.

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 135,000 people visited our steelworks in FY2018.

Internship programs and the endowment of a university course

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

Together with Local Communities

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 Tokohu 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 oysters and scallops in Kenennuma 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 Munroe Mountain in Iwate 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.

Cleanup activities in communities

All of our steelworks and factories are involved in cleanup activities of their surrounding areas and community. As a member of society, many employees participate in volunteer activities and cleanup activities, jointly with residents in the community.

Support of community-based education

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

Nippon Steel is active in activities of our corporate philanthropy in the support of music, particularly through the work of the Nippon Steel Arts Foundation. The Foundation manages Kioi Hall Tokyo, organizing performances of its resident chamber orchestra "Kioi Hall Chamber Orchestra Tokyo" and promoting Japanese traditional music by using Kioi Hall’s special small hall. We also formed the annual Nippon Steel Music Awards, in 1990, to encourage young classical music performers and to those who have made contributions to the development of classical music.

Activities in the support of sports as a social contribution

Nippon Steel manages or supports sports teams in the local communities of its steelworks. These include a judo club, which has produced Olympic medalists, baseball teams, which have sent many of its players to the professional leagues; a football team, a rugby team, and a volleyball team. All of these teams also contribute to their local community through various activities as sports clubs 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.

Relation to Shareholders, Government and Public Institutions

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.

Together with local communities

Together with local communities, we strive to provide renewed vigor to our local communities through the Risk Management Committee, management system are regularly confirmed through participation in government councils, study groups, etc., and through discussion and collaboration on risk management among Nippon Steel group companies (Autonomous Internal Control).

Corporate Governance Structure

The Nippon Steel Group aims to respond to confidence and trust extended by shareholders, business partners, and all other stakeholders, and to achieve healthy sustainable growth and medium- to long-term improvement in corporate value. For that purposes, the Group has established a corporate governance structure appropriate for its businesses.
Awards received in FY2018

<table>
<thead>
<tr>
<th>Award name</th>
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<tbody>
<tr>
<td>Excellent Supplier Award 2017 (12th time)</td>
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<tr>
<td>Excellent Supplier Award 2018</td>
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<tr>
<td>TAA Award (9th consecutive year) Panasonic Corporation</td>
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<tr>
<td>Significant reduction in CO2 emission by developing a new series of electrical steel sheets that realize high efficiency (Nippon Steel)</td>
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<tr>
<td>ECO-VC Gold Excellent Partners Meeting 2018</td>
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<tr>
<td>Excellent Supplier Award 2017 (12th time) TTX Company (USA)</td>
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<tr>
<td>High evaluation of quality, cost, delivery, service, financials, and management (Nippon Steel, Standard Steel)</td>
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<tr>
<td>Awards from customers</td>
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<tr>
<td>The 45th Iwatani Naoji Memorial Award (the first steel company awarded for the 7th consecutive year)</td>
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<tr>
<td>The Iwatani Naoji Foundation Development HRX19™ high-strength stainless steel for high-pressure hydrogen environments (Nippon Steel)</td>
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<tr>
<td>The 65th Okochi Memorial Production Prize</td>
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<tr>
<td>Okochi Memorial Foundation Development of environmental impact-reducing ultra-high-tensile wire rods for bridge cables (Nippon Steel)</td>
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<tr>
<td>The 53rd JSPMI Award, (Chairman’s Award) Japan Society for the Promotion of Machine Industry (JSPMI)</td>
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<tr>
<td>Development of high-efficiency, light-weight permanent magnetic retarder (Nippon Steel)</td>
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<tr>
<td>The 5th Oschir Memorial Production Prize</td>
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<tr>
<td>Oschir Memorial Foundation Development of environmental impact-reducing ultra-high-tensile wire rods for high-speed railroad cables (Nippon Steel)</td>
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<tr>
<td>The 3rd JSPMI Award, (Chairman’s Award) Japan Society for the Promotion of Machine Industry (JSPMI)</td>
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<tr>
<td>Development of high-effectiveness high-strength stainless steel plate (Nippon Steel)</td>
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<tr>
<td>Various reports for shareholders</td>
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<tr>
<td>Brochure on the overall businesses and management for investors</td>
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<tr>
<td>• Fact Book</td>
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<tr>
<td>• Financial Results</td>
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<tr>
<td>• Securities Reports</td>
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<td>• Corporate Governance Reports</td>
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<td>• Reports for Shareholders</td>
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Overview of the communication tools

Website

Eco-friendly resource-saving high-productivity stainless steelmaking process (YES) COLUMN

Stainless steel is a functional material with a corrosion-resistance property achieved by adding chromium. In its manufacturing, however, a large amount of chromium and other raw materials need to be added and the heat tolerance in smelting is low, which results in limited recycling of steel scrap and other raw materials. In addition, silicon raw materials are added in a converter furnace for reduction of oxide chromium during desulfurization by oxygen. This process generates a large volume of slag and causes chromium loss, hence there is an issue of environmental impact.

In order to solve this issue, we have made practical use of a process in which chromium oxide generated in a converter is collected and then melted with recycled materials such as chromium raw material and steel scrap. We have done this in order to make a converter that can reduce the environmental impact of the conversion process. The new process has reduced generation of slag by 60% and cut-off system emission of chromium by 95% compared to the conventional process, as well as having realized 100% recycling of chromium and other generated substances.

This technology’s uniqueness, practicality, and contribution to alleviating environmental impact were highly accredited, resulting in recognizing many awards, including the Oschir Memorial Production Grand Prize, the highest award of its kind for a corporation, in February 2018. Also awarded was the Minister of Education, Culture, Sports, Science and Technology Minister Prize for Science and Technology Development Division, in April 2019.

Nippon Steel’s logotype

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 wavy point representing the unlimited future potential of steel as a material. The cobalt blue and sky blue color palette represents innovation and reliability.