NIPPON STEEL

Nippon Steel Sustainability Report 2022

NET ZERO
NIPPON STEEL
Green Transformation
Initiative

NIPPON STEEL CORPORATION

Make Our Earth Green

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

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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.

CONTENTS

Editorial policy

This Sustainability Report is the 25th since the former Nippon Steel Corporation issued what is the first sustainability report by a Japanese steel manufacturer, in 1998. We believe it is extremely important to promote business activities that contribute to the realization of a sustainable society. We are therefore committed to diverse initiatives based on this idea.

In this report, in order to clearly express our approach toward helping realize a sustainable society, we present our sustainability initiatives in details with representative examples.

Period covered

The period covered in the report is fiscal 2021 (from April 2021 to March 2022). For some activities, the period from April 2022 to June 2022 is included.

Boundary of report

- Activities of Nippon Steel and its group companies in Japan and overseas
- Economic aspects: The *Nippon Steel Integrated Report 2022* (issued in September 2022) also covers the contents of the economic report.

Reference for guidelines

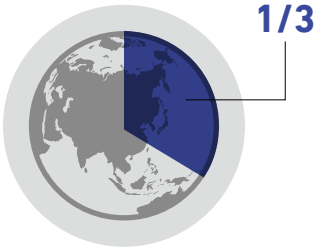
- GRI (Global Reporting Initiative) Standards
- "Environmental Reporting Guidelines 2018" by the Ministry of the Environment
- Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), established by the Financial Stability Board

鉄は、人と地球とともに

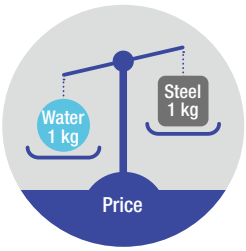
Attractiveness of Steel

Steel is an abundant, sustainable material that can be reborn endlessly

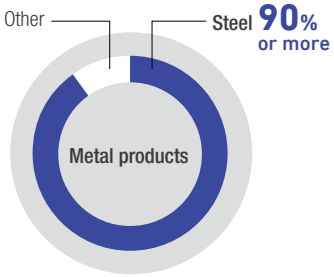
Iron is believed to constitute **one-third** of the Earth's weight.



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

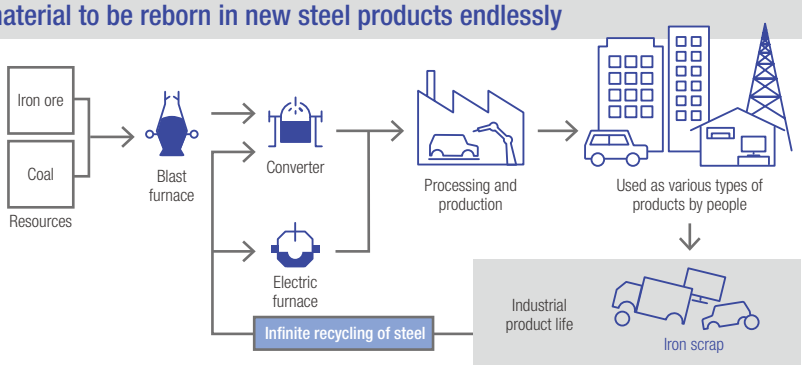


Steel represents **90% or more** of metal products, as steel being abundant, cheap, and having good workability, and has a wide range of applications.



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

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



Diverse properties and a wide range of applications

Due to diverse advantages such as strength and 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 for all of us now and will be with us in the future.

Diverse properties that support a wide range of applications

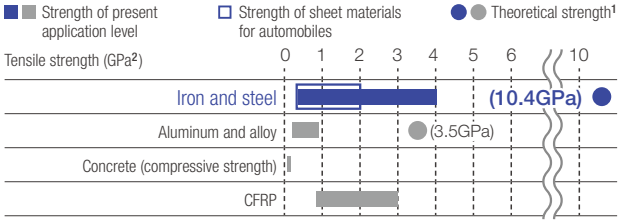
Strength	Weldability	Heat resistance
Toughness	Paintability	Cold resistance
Robustness	Magnetism	
Workability	Corrosion resistance	Weather resistance

Infinite potential

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

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

Potential capacity and present application level of material strength



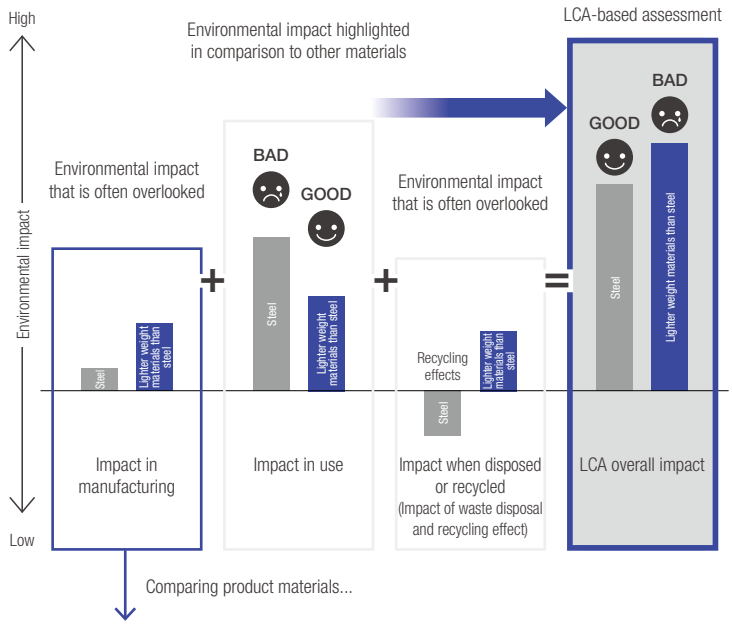
1 Theoretical strength is said to be 1/5 to 1/7.5 of the modulus of rigidity. The above data uses 1/7.5.
2 Gigapascal (GPa) is a unit to measure tensile strength. Giga denotes a factor of one billion (10^9).

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

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

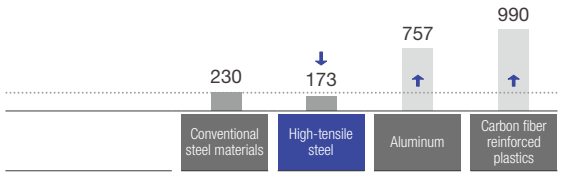
Some materials have low environmental impact in use but may have high environmental impact in the overall life cycle.

The Life Cycle Assessment (LCA) is therefore important.



Comparing product materials...

Comparison of GHG (Green House Gas) emission in producing an automotive part that has the same strength as conventional steel (kg-CO_2e)



	Conventional steel materials	High-tensile steel	Aluminum	Carbon fiber reinforced plastics
Functional equivalent weight (kg)	100	75	67	45
GHG emissions per unit (kg-CO_2e/kg)	2.3	2.3	11.3	22.0

Based on the public data of WorldAutoSteel

Steel's environmental impact in production is extremely lower than other materials, some of which are lighter than steel.

Note: Moreover, high-tensile steel is about 25% lighter than conventional steel and has a lower environmental impact.

Going forward, with the aim to further reduce environmental impact on climate change, Nippon Steel will make development toward carbon neutrality in steelmaking process.

Let's consider the overall life cycle

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

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

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

The blast furnace (BF) route to reduce iron ore to make steel may appear to generate a higher environmental impact than the method that melts steel scrap in an electric arc furnace (EAF) to make steel. However, the BF route creates steel products that generate scrap that, through recycling, has an effect of CO_2 emission reduction. As that scrap recycling effect offsets the CO_2 emissions in the BF process, environ-mental impacts of the BF and EAF routes in total terms are the same as steel is repeatedly recycled.

This approach is recognized in the ISO 20915 and the JIS Q 20915 and is becoming a global standard.

Acquisition of the "Eco-Leaf" environmental label

Nippon Steel has obtained the "Eco-Leaf" — an ecolabel certified by the Sustainable Management Promotion Organization (SuMPO), in compliance with the ISO 14025 international standards, for 35 products, representing more than 80% of its products.

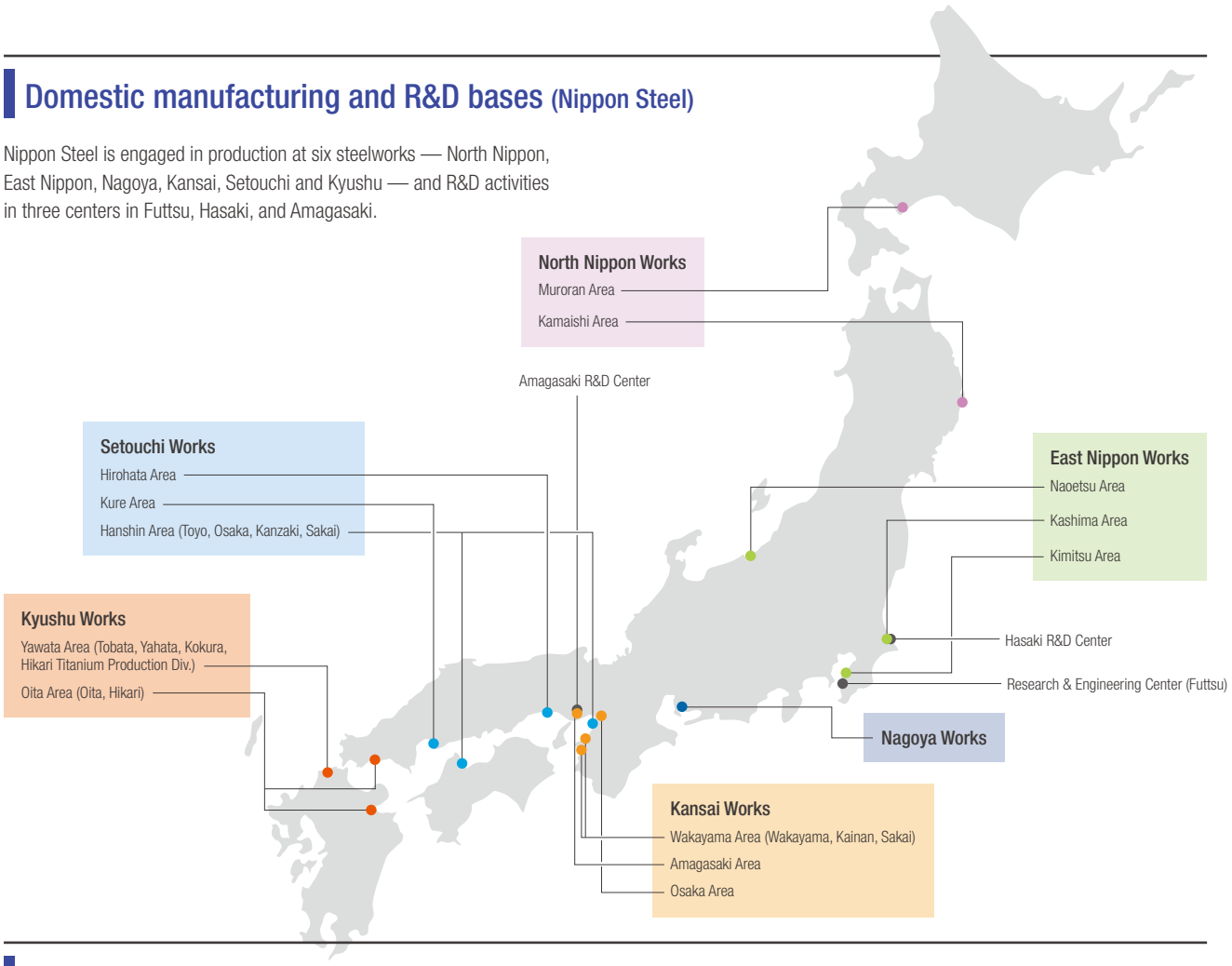
The Eco-Leaf is an EPD[3] certification program in use in Japan to disclose quantitative environmental information about the entire life cycle of a product, from resource mining and manufacturing to disposal and recycling. This allows customers to assess the environmental impact of the products they use.

3 EPD (Environment Product Declaration): The type III environmental label specified in the ISO 14025 international standard, which is designed to disclose quantitative environmental data certified by a third-party organization.

Nippon Steel Group's Businesses

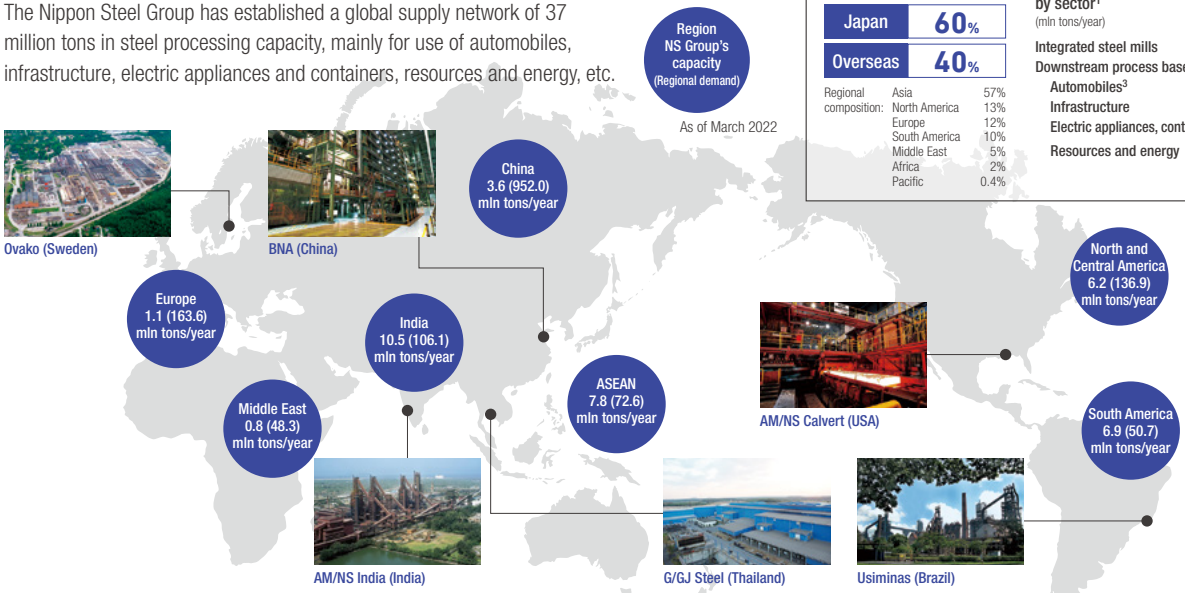
Domestic manufacturing and R&D bases (Nippon Steel)

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



Overseas manufacturing bases

The Nippon Steel Group has established a global supply network of 37 million tons in steel processing capacity, mainly for use of automobiles, infrastructure, electric appliances and containers, resources and energy, etc.



Sales composition by region

Japan		60%
Overseas		40%
Regional composition:	Asia	57%
	North America	13%
	Europe	12%
	South America	10%
	Middle East	5%
	Africa	2%
	Pacific	0.4%

Crude steel production capacity by sector[1]
(mln tons/year)

Integrated steel mills	21.0
Downstream process bases[2]	17.0
Automobiles[3]	12.8
Infrastructure	4.4
Electric appliances, containers, etc.	1.2
Resources and energy	0.4

1 In addition to companies with an equity stake of 30% or higher (including Usiminas), which are included in crude steel production data compiled by the World Steel Association, the capacity of our equity-method affiliates with an equity stake of less than 30% in which Nippon Steel plays a significant role in the supply of materials, as well as the capacity of a company whose products are sold by Nippon Steel (AGIS) are fully included.
2 Excluding overlap with the integrated steel mills (Sanyo Special Steel Manufacturing India, Standard Steel, and Ovako) and with a company (STP) which receives raw sheet supplies from other operating companies
3 Steel conversion value (converted to per-ton of crude steel)

The Nippon Steel Group's main business is in steelmaking with annual crude steel production capacity of approximately 47 million in Japan and 19 million tons overseas, and overseas annual steel processing capacity of 37 million. The Group is promoting business in four segments, including steelmaking.

Business segments

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

Chemicals and Materials Business

¥249.8 bn

Nippon Steel Chemical & Material Co., Ltd.

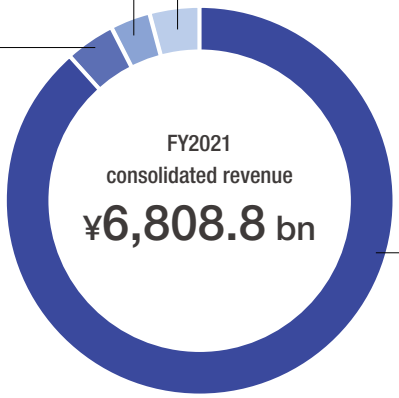
Nippon Steel Chemical & Material aims to contribute to society by combining chemical and material operations and utilizing its original material technologies. With coal chemicals, chemicals, functional materials and composite materials as its four main operating sectors, the company pursues sustainable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

Engineering and construction business

¥279.2 bn

Nippon Steel Engineering Co., Ltd.

Nippon Steel Engineering undertakes numerous projects worldwide in various fields: the environment and energy-related facilities (i.e., waste, offshore wind, biomass, and geothermal power generation); various pipelines; building construction and large steel structures (i.e., offshore steel structures, port construction), and steelmaking plants.



(Elimination of intra-company transactions, etc. –¥145.1 bn)

System solutions business

¥271.3 bn

NS Solutions Corporation

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

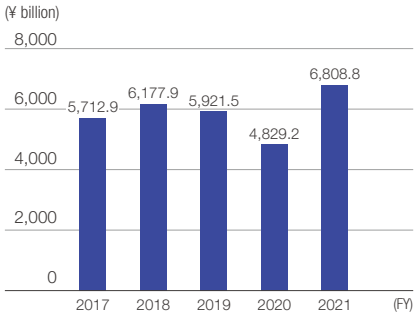
Steelmaking and steel fabrication business

¥6,153.6 bn

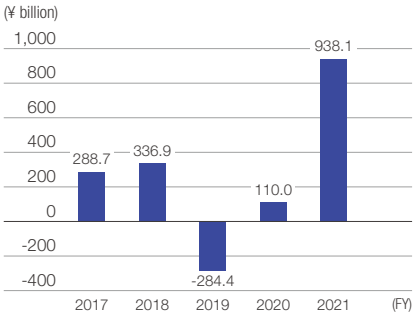
Nippon Steel Corporation

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

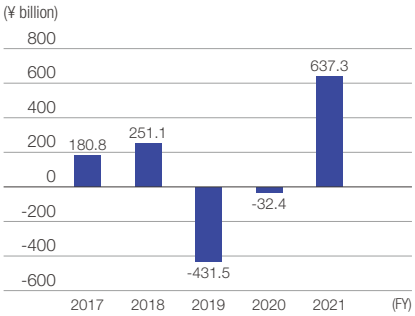
Revenue (consolidated basis)



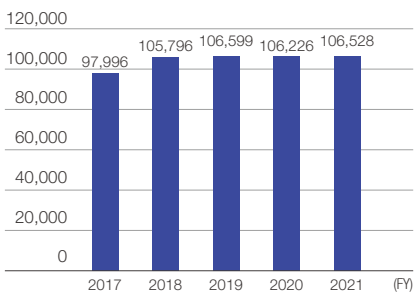
Business profit (consolidated basis)



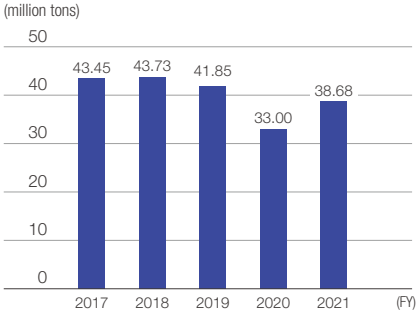
Profit attributable to owners of the parent (consolidated basis)



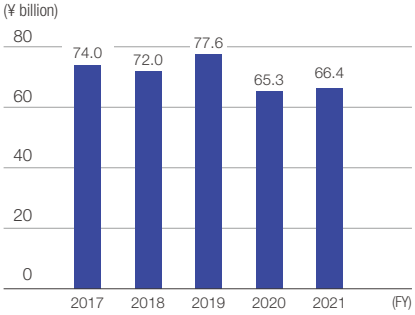
Number of employees (consolidated basis)



Crude steel production volume (non-consolidated basis)



R&D expenditures (consolidated basis)



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 and to advance the Carbon Neutral Vision 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.

Examples of specific initiatives

- Job creation through establishment of operating companies in emerging countries p. 5
- Reduction of vulnerability to disaster based on use of Nonframe method (construction method to stabilize slopes without damaging the natural environment)

- Use of converter slag fertilizer, a by-product of steelmaking, to improve farming productivity and salt damage in farmland p. 44
- Provision of titanium and stainless steel, which have excellent seawater corrosion resistance, for seawater desalination plants, securing agriculture water

- Promotion of air, water, soil risk management and chemical substance management pp. 39–41
- Development and provision of steel products that contain no substances of concern, such as lead and hexavalent chromium

- Promotion of employee training to raise skills (i.e., OJT, Off-JT, sending trainees to Junior College for Industrial Technology), hosting technology triathlon pp. 53–54
- Study sessions for teachers, internship for students p. 62

- Improvement of working environment for women, support for career formation and work-life balance pp. 47–48
- Increase in female employment and the number of female employees in management p. 48
- Prevention of harassment p. 52

- Recycling and reuse of limited water resources p. 37
- Promotion of water quality risk management p. 40
- Provision of titanium and stainless steel for seawater desalination plants
- Provision of lining steel pipes for delivery of clean water

- Efficient use of energy, such as 100% use of by-product gas p. 37
- 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 p. 22

- Promotion of diversity & inclusion (i.e., female empowerment, how to work and how to take time off from work, health promotion, and employment of the elderly and the disabled) pp. 47–48
- Promotion of DX to improve workstyle, productivity, worker safety management, etc. pp. 8, 60

- Pursuit of Eco Processes to help raise resource/energy efficiency and reduce environmental impacts pp. 37–38
- Introduction of advanced technologies through bilateral cooperation (India, ASEAN, etc.) p. 30
- Use of steel slag in road materials and materials for civil engineering pp. 8, 35

- Thorough compliance training, such as for the Anti-Monopoly Act
- Eliminating unfair discrimination, based on the respect on human rights pp. 45–46
- Expanded hiring of women and non-Japanese pp. 45–46

- Provision of various indispensable Eco Products for daily lives
- Provision of earthquake-resistance steel products
- Development of Nonframe method, which protects houses from disaster while maintaining views of nature

- Promotion of air, water, soil risk management and chemical substance management pp. 39–41
- Full recycling of by-products, including slag, dust, and sludge pp. 35–36
- Promotion of recycling of waste plastics p. 36

- Promotion of measures against climate change by implementing the Carbon Neutral Vision pp. 21–29
- Development and provision of Eco Products, such as high-tensile, light-weighted, energy-efficient steel sheets and light-weight railway wheels and axles for high-speed railways p. 22

- Regeneration of seaweed beds with the use of steel slag pp. 28, 43
- Promotion of sea area environmental improvement with the use of steel slag p. 35
- Voluntary clean-up activities at seashore nearby steelworks p. 61
- Collaboration with an NPO, "*Mori wa Umi no Koibito*" (participation in tree-planting, etc.) p. 61

- Promotion of air, water, soil risk management and chemical substance management pp. 39–41
- "Creation of Hometown Forests" to promote greenery within steelworks p. 43
- Site cleaning activities around steelworks

- Bribery prevention guidelines to be established and made well known p. 62
- Elimination of antisocial forces
- Thorough confirmation of no use of conflict material p. 59
- Thorough management of security export control

- Eco solutions to transfer and spread environmental, energy-saving technologies to emerging markets p. 30
- Japan-India and Japan-ASEAN regular exchanges among public and private steel-related parties p. 30
- Support for human resources development to build an energy management system in emerging countries

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

PICKUP 2021

1 Conducted a demonstration experiment using the Nippon Steel Group's steel pipe piles and calcia modified material at the site of the Expo 2025 Osaka

May 2021

In the demonstration experiment of advanced technologies at the planned site of the 2025 Osaka-Kansai Expo in Yumeshima, Konohana-ku, Osaka, Nippon Steel as a representative company will carry out an NS ECO-PILE™ anchoring and extraction experiment and an anchoring support improvement experiment using calcia modified material.

Installation of NS ECO-PILE™ and calcia modified material

2 Received the 2021 Innovation Award from Schneider Electric for the advanced technology of grain-oriented electrical steel sheets

June 2021

Nippon Steel's grain-oriented electrical steel sheet received the Best Supplier Award in the Innovation Category at Schneider Electric's Supplier Day. More than 150 suppliers are invited to this event each year. The product was highly praised for its contribution to product competitiveness of Schneider's strategically important distribution transformers, the contributions including reduction in loss of power (energy savings, high efficiency and CO_2 emissions reduction when transferring electrical energy) and the reduction of noise.

Transformer

3 Expanded acquisition of EcoLeaf environmental labels for certification of the environmental impact in product life cycles

July 2021 Sep. 2021 Feb. 2022 April 2022

Since December 2019, Nippon Steel has published a total of 35 EcoLeaf Environmental Product Declarations (EPD) covering most of our products. The EPD enables customers to assess the environmental impact of our products they use throughout their life cycles. We intend to obtain EcoLeaf for other products.

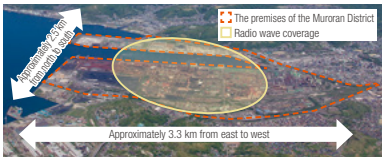
[Products that acquired EcoLeaf since FY2021]
Seamless, high-frequency welded well pipes/line pipes, steel plates for building structures, high-tensile strength steel plates for building structures, steel bars and wire products, steel plates for structure, steel sheets, and reduced-process steel bar and wire products

Products with the EcoLeaf environmental label (Cans made of Nippon Steel's tin products)
© Suntory Food International

4 Obtained a local 5G radio station license with the highest output power in Japan to accelerate the DX in steelmaking sites

Nov. 2021

Nippon Steel has obtained a local 5G license from the Ministry of Internal Affairs and Communications, and has started testing its application at steelmaking sites in the Muroran Area of the North Nippon Works in cooperation with NS Solutions. The local 5G accommodates unlimited data traffic and can also provide the highest level of security. It also has the advantage of a private wireless network that enables communication throughout the large premise.



Radio range of the private radio network (Muroran Area of the North Nippon Works)

5 Opened in-house childcare centers at seven manufacturing bases nationwide

Dec. 2021 Jan. 2022

In order to establish working environments where diverse employees can be empowered, Nippon Steel has been taking various measures. For supporting shift workers in the childbirth and childcare phase, specific measures have been implemented in view of the child-rearing environment by region. By January 2022 we had opened in-house childcare centers at seven manufacturing bases across Japan.

A childcare center in the Kashima District

6 Signed memorandum with Vale, one of the world's leading mineral resource companies, for realizing carbon-neutral steelmaking processes

April 2022

Nippon Steel has signed a memorandum of understanding with Vale S.A. to strengthen relations and to examine and discuss concrete measures for realizing carbon-neutral steelmaking processes. The companies will jointly research the utilization of direct-reduced iron, green-mold pig iron, green briquettes, and other materials that contribute to carbon-neutral steelmaking processes, and pursue their feasibility.

Rendering of a green-mold pig iron plant of Vale's 100% subsidiary TECNORED (under construction)

Towards the Realization of a Sustainable Society, and the SDGs

Eiji Hashimoto
Representative Director and President

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

In March 2021, we announced a new medium- to long-term management plan, with the aim of continuing to grow to "become the best steelmaker with world-leading capabilities," that supports Japan's industrial competitiveness. We have since been undertaking our corporate management accordingly. By including "Nippon Steel Carbon Neutral Vision 2050" within the plan, we have identified our efforts concerning climate change issues as our greatest priority issue. Our basic approach toward realizing a decarbonized society is to win in the development competition with other countries and continue to lead the world's steel industry. Through these efforts, we are committed to establishing a virtuous cycle of environmental sustainability and corporate growth, and improving corporate value.

In this Sustainability Report 2022 we are pleased to present to you the current status of promoting the Carbon Neutral Vision 2050 as well as wide-ranging sustainability-related initiatives as we advance toward realizing a sustainable society. Specific themes include the environment, human rights, diversity & inclusion, safety, disaster prevention, and quality.

Having positioned environmental matters as priority issues that underlie our corporate management as stated in our Basic Environmental Policy, we have pledged to contribute to the creation of a society oriented toward environmental preservation and with low environmental impact. While we are advancing initiatives for the Sustainable Development Goals (SDGs) adopted by the United Nations, we recognize climate change issues as a priority problem that may threaten survival of the human race. We are proactively undertaking diverse environmental issues concerning various areas of concern, from local communities to the entire planet, including climate change issues, creation of a circular economy, and promotion of the environmental risk management. We are thereby contributing to the realization of a sustainable society.

The ongoing Carbon Neutral Vision 2050 efforts have two aspects.

The first aspect is our action to contribute widely to the realization of a carbon neutral society through providing users with our advanced high-performance steel products and solutions in Japan and overseas. This is also a great business opportunity for us. As an upfront investment in this effort, we have decided to make investment in improving the capacity and quality of electrical steel sheets, and in building a

next-generation hot-rolling mill at the Nagoya Works. We are steadily progressing in making these investments.

The second aspect is a challenge of developing new production process aimed at radically reducing CO_2 emissions in the manufacturing process. This requires a challenging advanced technical development, that requires us to act in hitherto unexplored areas. This is an enormous challenge in the history of the steel industry. We find it crucial to solidify our development prospects ahead of others and start actual use of the new manufacturing processes at an early stage. We are taking this dramatic change in the business environment as a great opportunity to reestablish our overwhelming superiority in the world steel industry, and we are determined to actively address it as a top management issue. Further, we aim to become the first to provide carbon neutral steel to our customers and thereby contribute to their reduction of CO_2 emissions.

Our targets are to reduce CO_2 emissions by 30% compared to 2013 in 2030 and achieve carbon neutrality in 2050. We have already launched earnest development efforts toward decarbonizing the steelmaking process. As an example, in December 2021 our project to develop technologies required for achieving these targets has been adopted as a part of the "hydrogen utilization in iron and steelmaking processes" project of the government's Green Innovation Fund.

We are determined to boldly take up the challenge toward the realization of carbon neutrality through collaboration by the public and private sectors in various areas, including the government's support for R&D and equipment installation, the establishment of an infrastructure to supply hydrogen, the realization of a low-cost, abundant carbon-free power sources, and the establishment of a system for society as a whole to bear the enormous costs associated with these.

We also believe that we need to help build a circular economy, from the viewpoint of further growing the economy while building a sustainable society. Steel is a material which can be easily taken out of a present use and endlessly recycled without causing deterioration in quality. Steel can be described as a perfect embodiment of a circular economy. Nippon Steel is also actively engaged in use of by-products generated in steelmaking for achieving zero emission. We also recycle 100% of used and discarded plastic containers and packaging generated in society and collected by us. In addition, in accordance with the Law for Promoting the Recycling of Plastic Resources enforced in April of this year, we are considering to expand the recycling volume of plastic waste recycling. We are committed to contributing to the realization of a circular economy by means of tireless technological innovations.

Concerning maintenance and improvement of the living environment in our communities, 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 conditions of each base of operations, thoroughly taking measures from both hard and soft aspects to reduce environmental burden.

With regard to biodiversity preservation, which we recognize as indispensable as part of the base of our business activities, we have long been involved in the "Creation of a Hometown Forest" at each steelworks, and "blue carbon" activities designed to create seaweed beds and absorb CO_2 in coastal waters. We are thus developing initiatives that harmonize nature protection and production activities. We will continue to use our management resources and accelerate various initiatives. We formally expressed our support to Keidanren's Declaration of Biodiversity and Action Policy and are promoting its activities in accordance with our policy of action based on this. As initiatives to establish a society co-existing with nature are both regional and global issues, we intend to incorporate them in our business activities and to execute environmentally integrated management, with the aim of realizing a sustainable society.

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). We are eager to continue to prevail as a company that helps solve diverse social issues through its business activities.

In this report, we are presenting our engagement with various stakeholders as well as our response to social issues. In addition to the environment issues, specific themes include respect for human rights, diversity and inclusion, safety, safety and disaster prevention, quality, supply chain management, and coexistence with the community and society of which we are a part.

In particular, the themes we presented in detail include the business activities that respect diverse values and human rights issues, and the activities related to diversity and inclusion from the perspective to becoming a company that allows its workforce to demonstrate their full capabilities and be empowered with pride and fulfillment. Based on the belief that the development of excellent personnel is a prerequisite for the production of excellent products, we are working on strengthening our manufacturing capability with emphasis on the development of our human assets. In order to live up to our Corporate Philosophy of contributing to the development of society and to be continually trusted by everyone, we are committed to fulfilling our social responsibility.

Sustainability issues are considered as one of our priority management issues, which form part of the base that supports sustainable corporate growth. We have thereby identified key challenges (materiality) of sustainability issues that should be addressed in a focused manner, with due consideration to our corporate principles, values, stakeholders' expectation, and our growth strategy. We intend to steadily promote its execution and follow-up by checking Key Performance Indicators to assess outcomes of our efforts.

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

Materiality of Sustainability Issues

Nippon Steel recognizes that sustainability initiatives are one of the important issues and form the base that supports the very existence and growth of the company. Among the initiatives, the issues to be focused by taking into account our shareholders' expectations and our Corporate Philosophy, Values, and growth strategy have been identified as materiality (priority issues).

Process to identify materiality

Consider requests from stakeholders on environmental, social issues and listing candidate issues → Generalize the issues in due consideration of the company's corporate philosophy and values → Verify the issues from the viewpoint of the company's value creation process and strategy → Discuss and approve issues in the Board of Directors meeting

Identified materiality (priority issues)

1. Safety, environment, and disaster prevention

- Safety and health
- Environment
  - Promotion of climate change measures
  - Contribution to creation of a circular economy
  - Promotion of environmental risk management
- Disaster prevention

2. Quality

- Quality control and guarantee
- R&D and intellectual property management
- Solution that result in customer satisfaction

3. Production

- Stable production and supply

4. Human resources, and diversity & inclusion

- Respect for human rights
- Diversity & inclusion
- Human resource development

5. Together with local communities

- Environmental preservation/creation activities in communities
- Activities mainly in the support of education, sports, and arts

6. Corporate value enhancement and profit distribution

- Securing of profit and enhancement of corporate value
- Profit distribution

Thorough implementation of compliance

- Adhering to laws and regulations as a base of all activities

Nippon Steel's Materiality

In consideration of our stakeholders' expectations, we have defined the materiality based on the following principles. We believe that tackling these materiality issues will contribute to the achievement of the United Nations' 2030 Agenda for Sustainable Development, featuring Sustainable Development Goals (SDGs).

1 Materiality with due consideration of the corporate philosophy and priorities in manufacturing

Our Corporate Philosophy (Our Values) states: "The Nippon Steel Corporation Group will pursue world-leading technologies and manufacturing capabilities, and contribute to society by providing excellent products and services."

Concerning "provision of excellent products and services," our critical mission as a responsible manufacturing company is to reliably produce and deliver quality products that satisfy customers. Needless to say, the prerequisites to enable this mission include "safety, environment, and disaster prevention" as well as thorough compliance to rules and regulations.

The "world-leading technologies and manufacturing capabilities" are realized by our human capital. Securing and fostering of outstanding personnel is an important challenge to be overcome in order to strengthen overall manufacturing capabilities. We firmly believe that respect for human rights and diversity & inclusion, as well as promotion of physical and mental wellness strength are the basics for our employees to work vigorously.

With regard to the relationship with society, we must maintain good relationship with the community where our steelworks or other facilities are located. This is indispensable for us to continue operating business in the future. We are pledged to operate in an environmentally-friendly manner and maintain good communication with local communities, as a corporate citizen.

2 Materiality with due consideration of the company's value creating process and potential changes in business environment

A base of our value creation process is to use a diverse range of financial/non-financial assets and competitive advantages, and to provide products and solutions to customers. In order to reproduce such processes, stable production and continual profit generation are indispensable.

In addition, having positioned environmental matters as priority issues that underlie our corporate management, we have pledged to contribute to the creation of a society oriented toward environmental conservation and with low environmental impact. We have also been engaged in building of a circular economy through reduction of CO_2 emissions by the three "Eco" initiatives and innovative technology development, and recycling of industrial waste (such as plastics).

Concerning the climate change problems that affect the survival of humanity, we are making efforts aimed at carbon neutrality by 2050 from two aspects: Provision of high-performance steel products and solutions to reduce CO_2 emission of the society as a whole, and breakthrough technology development to decarbonize steelmaking processes.

3 Corporate value enhancement and profit distribution

We are committed to continuing operations as a sustainably growing company by generating profit and raising corporate value from business activities, including sustainability initiatives. We will also contribute to society by providing excellent products and services, and distributing profit to employees, government, shareholders, and other stakeholders.

4 Thorough compliance

As a responsible leading company, we thoroughly adhere to laws and regulations, which is fundamental to all of our activities. It should be achieved by our independent efforts, based on our corporate philosophy, value, code of conduct and alike.

Materiality, KPIs and major initiatives in FY2021

1. Safety, environment, and disaster prevention

1 Safety and health p. 57

Target and KPI	Main Initiatives and Achievements in 2021	
● Accident frequency rate of 0.10 or less ● Zero fatal accident	● Prevention and risk reduction of accidents, based on safety risk evaluation ● Promotion of disaster prevention aimed at prevention of repeated disasters (thorough adherence to the six company-wide compliance requirements and promotion of greater machine safety) ● Acquisition of ISO45001 for management systems of occupational health and safety (OH&S) to enhance safety level	● Accident frequency rate: 0.10 ● Number of fatal accidents: 2

2 Environment

1 Promotion of climate change measures

Promotion of the Carbon Neutral Vision 2050 (CO_2 emission reduction) p. 21

Target and KPI	Main Initiatives and Achievements in FY2021
● Target in 2030: 30% reduction vs. 2013 ● Vision for 2050: Carbon neutral	● Selection of the "hydrogen utilization in iron and steelmaking processes" project as a Green Innovation Fund project ● Decision to establish a small test furnace for the manufacture of high-grade steel in an electric arc furnace and direct reduction of 100% hydrogen ● The project, which was established in April 2021, was reorganized into a permanent organization in April 2022 and was expanded to the scale of a team of about 90 people.

Contribution by "Three Ecos"

1 Implementation of "Eco Process" pp. 18, 37, 38

Target and KPI	Main Initiatives and Achievements in FY2021	
● Maintaining high-level effective use of energy	● Effective use of byproduct gas (coke oven gas, blast furnace gas etc.) and waste heat	● Use of byproduct gas: 100% ● Use of waste heat in steam generation: 67% ● In-house generated energy use in in-house power generation: 75%
● Promotion of adopting advanced energy-saving technology	● Adoption of high-efficiency power generation equipment and oxygen plant; regeneration burner in reheating furnace	● Investment cost for energy-saving: ¥8.7 bn

2 Enhancement of "Eco Products" pp. 8, 22

Target and KPI	Main Initiatives and Achievements in FY2021	
● Supply of high-performance steel products to help reduce CO_2 emissions through use of their end products	● Investment in capacity and quality improvement measures to meet the growing demand for electrical steel sheets and higher-grade products ● Decision to install a next-generation hot rolling mill ● Expansion of products that acquire EcoLeaf environmental labels	● Yawata Area of Kyushu Works and Hirohata Area of Setouchi Works: Start of operation in 1H of 2024 (¥123 billion in investment) ● Nagoya Works: Start of operation in 1H of 2026 ● Acquisition of EcoLeaf environmental labels for 35 products (more than 80% of our products), up from 15

3 Contribute with "Eco Solutions" p. 30

Target and KPI	Main Initiatives and Achievements in FY2021 (including some results in FY2020)	
● Transfer and dissemination of the world-leading energy-saving technology to help CO_2 emission reduction globally	● Growing cumulative CDQ delivery record by Nippon Steel Engineering in the group	● 128 CDQ cumulative units (contributing to 25.81 mn tons-CO_2 reduction, FY2020)

2 Contribution to creation of a circular economy

Realization of zero emissions within the company/recycling of waste generated in society pp. 35, 36

Target and KPI	Main Initiatives and Achievements in FY2021	
● Reduction in final disposal amount: 263,000 tons (FY2025 target)	● Promotion of recycling of byproducts (slag, dust, sludge, etc.) in and out of the company	● Final waste disposal: 307 thousand tons
● Establishment of a waste plastics recycling system to expand its collection volume	● Aggressive promotion of recycling treatment, according to the Chemical Recycling Act	● Packaging/container plastic waste treatment: 220 thousand tons (equivalent to 30% of Japan's total plastic waste)

3 Promotion of environmental risk management

Air environment preservation pp. 39, 41

Target and KPI	Main Initiatives and Achievements in FY2021	
● Maintaining low-level emissions of NOx and SOx	● Installment of equipment that reduces SOx and NOx emissions; shifting to low-sulfur fuel; adoption of low NOx regenerating burners	● SOx: 13 mn Nm^3 ● NOx: 25 mn Nm^3
● Maintaining of lower discharge levels than voluntary targets in chemical substances VOC (volatile organic compounds): 1,106 tons/year (down 30% vs. FY2000) Benzene: 172 tons/year (voluntary target, along with the government target)	● Continual efforts based on the voluntary reduction plan	● VOC: 545 tons/year ● Benzene: 95 tons/year

Water environment preservation p. 40

Target and KPI	Main Initiatives and Achievements in FY2021	
● Recycling of water; high-level stable use of recycled water	● Water treatment, recycling and reuse of freshwater used by the company	● Use of recycled water: app. 90%

3 Disaster prevention p. 57

Target and KPI	Main Initiatives and Achievements in 2021	
① Elimination of disaster risks and group-wide sharing of effective measures ● Zero serious disaster-related accident	● Prevention of recurrence via corporate-wide implementation of measures against risks emerged from the accidents ● Risk assessment to detect new disaster risks; execution of measures from hard/soft aspects to reduce risk and control residual risk ● Self-monitoring (auditing) by those in charge of disaster prevention in steelworks; and management by the head office management through interviews	● Serious disaster-related accidents: 0

2. Quality

1 Quality control and guarantee p. 58

Target and KPI	Main Initiatives and Achievements in FY2021
● Systemization and automation aimed at more credibility in testing and inspection	● Progress in automatic input of inspection results from testing/analytical devices and measurement devices

2 R&D and intellectual property management Integrated Report pp. 63–64

Target and KPI	Main Initiatives and Achievements in FY2021	
● Strategic R&D, aimed at sustainable growth ● Protection and use of intellectual property	● Increasing applications and acquisition of rights depending on the importance of invention based on business strategy and business plan ● Integrated management of the patents held and products and technologies to respond to patent infringement and accelerate the effective use into technology alliances	● R&D expenses: ¥66.4 billion (consolidated) ● The number of patents held: approximately 30,000 (14,000 in Japan and 16,000 overseas)

3 Solution that result in customer satisfaction p. 66

Target and KPI	Main Initiatives and Achievements in FY2021	
● Number of awards from customers, government, and institutions	● Awards received include the 68th Okochi Prize, the 54th "Ichimura Prize in Industry for Distinguished Achievement" and "Ichimura Global Environmental Prize in Industry for Distinguished Achievement", the 2022 MEXT Minister's Award, and the 2022 National Commendation for Invention.	● Number of awards from customers, government, and institutions: 9

3. Production

1 Stable production and supply p. 60

Target and KPI	Main Initiatives and Achievements in FY2021
● Initiatives for more stable production and supply (hardware and software)	● Start of refurbishment of Nagoya No. 3 coke and relining of Nagoya No. 3 blast furnace ● Standardization of veterans' operational skills and extended use of experts ● Use of IoT and AI for operational support, efficiency improvement of facility inspection and operation monitoring, and reinforcement of predictive monitoring

4. Human resources, and diversity & inclusion

1 Respect for human rights

Target and KPI	Main Initiatives and Achievements in FY2021	
	● "Respect for Human Rights" pp. 45–46	

2 Diversity & inclusion

Target and KPI	Main Initiatives and Achievements in FY2021	
● The number of female employees in management positions: at least 2 times, (vs. 36 in FY2020), and 3 times as target in 2025; at least 4 times, and 7 times as target by 2030 ● The ratio of paid holidays taken: 75% or higher ● Wellness management aimed at maximizing people's ability up to the age of 65, and support to enhance mental and physical health	● "Diversity & Inclusion" pp. 47–52	● Number of women in managerial positions: 55 (as of April 2022) ● Ratio of women in hiring: 25% of office staff; 10% of operators; 15% in overall (FY2020–2022 average) The ratio of paid holidays taken: 77.8% (FY2021)

3 Human resource development

Target and KPI	Main Initiatives and Achievements in FY2021	
● Promotion of measures to develop human resources	● "Human Resources Development" pp. 53–56	● Hours of training and education: 540 thousand hours/year (19 hours/person, year)

5. Together with local communities

1 Environmental preservation/creation activities in communities

pp. 18, 43

Target and KPI	Main Initiatives and Achievements in FY2021	
● Green space development to contribute to the local environment	● Tree planting activities by new employees in steelworks ● Funding for green space development and maintenance	● Greenery space: 840 ha ● Expenses for green space development and maintenance: ¥1.2 bn

2 Activities mainly in the support of education, sports, and arts

p. 62

Target and KPI	Main Initiatives and Achievements in FY2021 (including some results in FY2019)	
● Ongoing promotion of hosting plant visits	● Proactively accepting plant visits by shareholders, investors, and junior high/elementary school students	● Number of plant visitors: app. 130,000 (FY2019 results; almost no implementation in FY2020 and FY2021 due to the COVID-19 pandemic)
● Continual execution of corporate philanthropy in the support of music via Nippon Steel Arts Foundation	● Support of music activities via presentation of Nippon Steel Music Awards and operation of the Kioi Hall	

6. Corporate value enhancement and profit distribution

1 Securing of profit and enhancement of corporate value

Target and KPI	Main Initiatives and Achievements in FY2021	
● ROS of 10% (FY2025 plan target) ● ROE of 10% (FY2025 plan target)	Please see the 11-Year Financial Performance section of Nippon Steel's Integrated Report pp. 101–102.	● ROS of 13.8% ● ROE of 20.5%

2 Profit distribution

Target and KPI	Main Initiatives and Achievements in FY2021	
1 Salary and wages payment to employees ● Bonus payment amount ● Revised amount of salary	Please see the following: Fact Book: Wages and Bonuses Integrated Report pp. 35–39: Financial Strategy pp. 40–42: FY2021 Operating Results pp. 99–100: Financial Information	● Base bonus amount: ¥2.37 mn ● Revised amount of salary: ¥3,000
2 Appropriate tax payment ● Tax payment (consol.)		● Tax payment (consol.): ¥86.0 bn
3 Dividend payment to shareholders ● Dividend payment Note: Target consolidated payout ratio: around 30% (FY2025 management plan)		● Dividend per share: ¥160/year

Thorough implementation of compliance

Adhering to laws and regulations as a base of all activities

Please see the Corporate Governance section of Nippon Steel's Integrated Report pp. 89–98.

Nippon Steel's Environmental Management

Nippon Steel has set the Basic Environmental Policy based on its belief that the environmental management is an integral part of corporate 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.

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

Three ecos

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 CO_2 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.

Five priority areas for achieving the SDGs

In order to achieve the SDGs, we have identified five priority areas based on our Basic Environmental Policy and are working on various environmental issues.

Specific initiatives in five priority areas

Recognizing that efforts in the five priority areas are important for the realization of a sustainable society, we are steadily implementing measures in each of these areas.

In particular, since we announced the Carbon Neutral Vision 2025 in March 2021, we have been actively working on climate change measures as the most important management issue.

Promotion of climate change measures

- Ensure progress toward the Carbon Neutral Vision 2050
- **Provision of two types of value**
  High-performance steel products and solutions (Eco Products)
  Decarbonization of steelmaking process (Eco Process)
- **Establish a Green Transformation (GX) Promotion System**
- **Cooperate with society, make policy proposals, and work in industry organizations for achieving carbon neutrality**

- Transfer and diffuse decarbonization technologies overseas (Eco Solutions)
- Make efforts to address climate change in the field of resource recycling
- Make efforts to adapt to climate change
- Disclose information according to recommendations of the TCFD

Carbon Neutral Vision 2050

Provision of two types of value

Provision of high-performance steel products and solutions that contribute to reducing CO_2 emissions in society

eco PRODUCTS

Provision of carbon neutral steel through decarbonizing our steelmaking processes

eco PROCESS

Reduce CO_2 emissions at the time of production and processing by customers

Reduce CO_2 emissions at the time of use of our products by end customers

Reduce CO_2 emissions in customers' supply chains

Innovative Technology Development

Contributing to creation of a circular economy

- Expand efficient use of resources and energy
- Promote internal zero emission
- Accelerate recycling of waste generated in society

Promotion of environmental risk management

- Conserve air environment
- Conserve water environment
- Respond to other environmental risks (soil, chemical substances and wastes)

Promotion of environmental relation activities

- Work on biodiversity conservation
- Disclose and have dialogues centering on environmental information in an appropriate and timely manner
- Communicate actively on environmental issues

Promotion of environmental management system

- Establish an environmental management organization
- Work at managing and improving the level of environmental management
- Groupwide environmental management

Promotion of Environmental Management System

Nippon Steel has built an environmental governance and 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 environmental audits and following the plan-do-check-act (PDCA) cycle.

Establishment of environmental management system

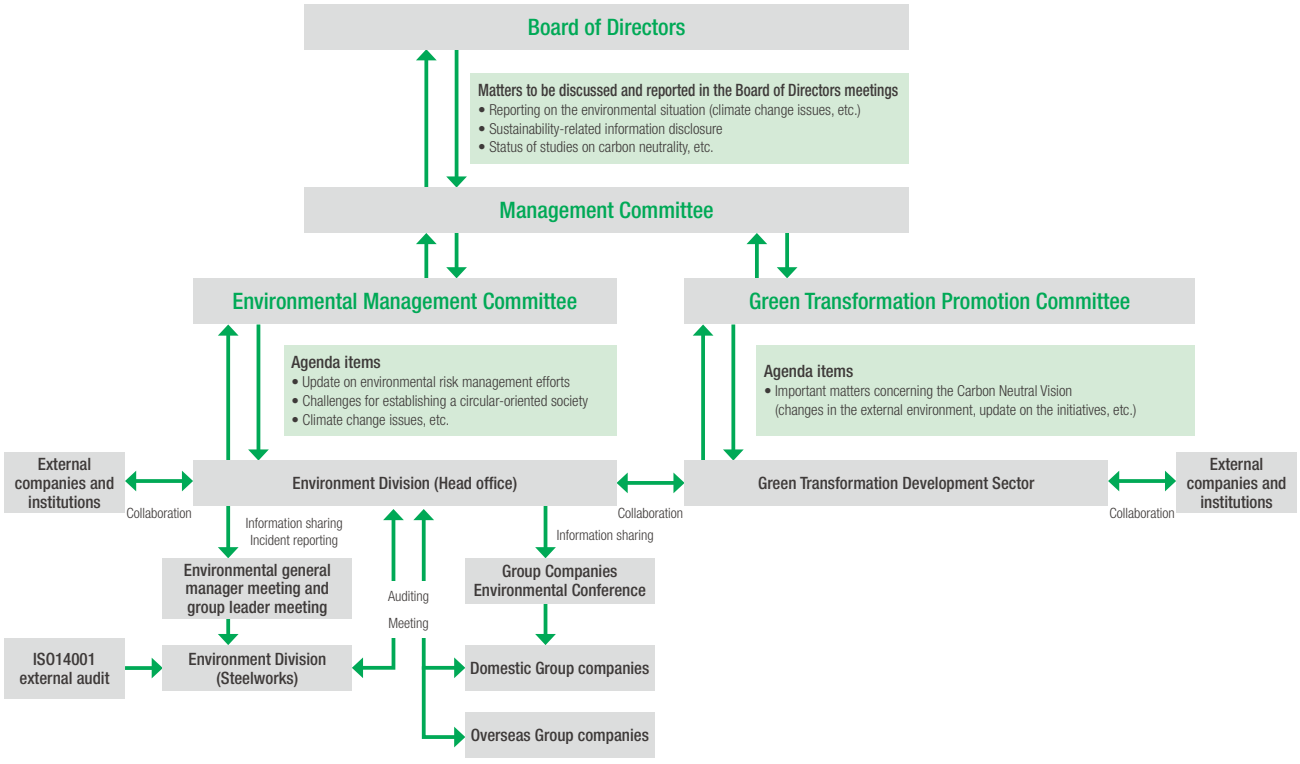
Nippon Steel has two committees — the Environmental Management Committee and the Green Transformation Promotion Committee — to address environmental issues, including climate change.

The Environmental Management Committee is chaired by the Executive Vice President in charge of Environment. Other Executive Vice Presidents, Directors and Executive Officers are members of the Committee. Meetings are held every six months. The Committee manages climate change and environmental risks such as air, water and waste. As a part of the enhancement of governance, environmental general manager meetings and environmental group leader meetings, with participation by people from all steelworks, are regularly held. In particular, Nippon Steel works to reduce risks related to settled dust, wastewater, and waste including activities, based on the work of experts conferences held for each of these areas.

The Green Transformation Promotion Committee is chaired jointly by the Executive Vice President in charge of Environment and the Executive Vice President in charge of Technology. Other Executive Vice Presidents, Directors and Executive Officers are also members of the Committee. The committee meets as needed to review important matters related to the promotion of carbon neutrality (changes in the external environment, update on the initiatives, etc.)

The content of discussions on climate change and the environment at the two committees are reported and discussed as one of the risk management items of the entire company at the Management Committee and the Board of Directors meetings, both of which are attended by the Chairman and the President. The Board of Directors oversees the risk management by being regularly reported about important management risks which were initially reported and discussed at the Management Committee. Environmental issues, including climate issues, are addressed at least four times a year. In this way, climate change and other environmental management are integrated into our overall governance.

Environmental management system



Efforts to maintain and improve environmental management levels

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

For the group companies (79 companies subject to environmental review) including those overseas, a direct interview is conducted by a member of the Head Office Environment Department to improve management levels. This is part of the corporate governance conducted by the Head Office Internal Control/Audit Department.

Internal audit (hearings)

Internal audit (on-site patrol)

Environmental risk management concerning Group companies

From the group companies in Japan, Nippon Steel has identified 57 companies (as of April 2022) as having certain environmental impact and holds meetings for those companies twice a year. In the meetings, we share information including the latest trends of environmental laws and regulations, cases of environmental initiatives with the goal of reducing environmental risks. In addition, we have established a venue to share information within the portal site to disseminate information on environmental regulatory trends and the troubles.

Costs associated with environmental conservation (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. Environmental conservation costs, which combine the costs of capital investment associated with environmental measures, energy-saving measures, and recycling measures, and expenses incurred to conserve the environment, totaled ¥148.7 billion in fiscal 2021: ¥16.3 billion for capital investment and ¥132.3 billion for environmental conservation. Details for environmental conservation costs are listed below.

Environmental conservation costs

(¥ billion)

Item		FY2021	
		Capital expenditures	Total expenses
Pollution Prevention Costs	Air pollution control (including measures against dust)	13.2	30.2
	Water and soil pollution prevention, noise and vibration prevention	0.5	9.3
Global Warming Prevention Costs	Energy saving measures (including energy recovery facilities such as TRT and CDQ)	2.7	6.1
Costs of Recycling Resources	Recycling of resources and generated materials	–	47.1
	Industrial waste treatment (including PCB)	–	10.8
	Business-related general waste treatment, etc.	–	0.5
Environmental Management Activities Cost	Construction of EMS and acquisition of ISO14001 certification	–	0
	Monitoring and measurement of environmental loads	–	1.5
	Personnel expenditures related to environmental measures, etc.	–	2.6
Research and Development Costs	Development of Eco Products	–	5.9
	Development of products which have low environmental impact during manufacture, etc.	–	12.6
Social Activity Costs	Beautification and greening of offices	–	1.2
	Supporting environmental organizations, etc.	–	0.1
Other Environmental Costs	Environmental fines, etc.	–	4.4
Total		16.3	132.3

It is difficult to quantify environmental preservation effects in monetary terms, since such calculation would require many assumptions. Therefore, environmental preservation performance is kept track of as effects taking environmental measures, which are reported in this report and on our website. For example, reduction in energy consumption is shown on page 19; water consumption volume, on page 40; and various resources spent, on page 37.

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

Promotion of Climate Change Measures

1. Safety, environment, and disaster prevention

Nippon Steel recognizes climate change as a priority problem that threatens survival of the human race. Climate change would also severely affect our business environment and earnings. In order to do our share of actions needed to influence the environment, and at the same time ensure sustainable operations, we are working at energy conservation and CO_2 emissions reduction throughout our supply chain.

Nippon Steel Group's efforts for energy conservation and CO_2 emissions reduction

In March 2021, we announced the Nippon Steel Carbon Neutral Vision 2050, in support of the Japanese government's ambitious policy to realize a carbon-neutral society in 2050. Through carbon neutralization, we will offer two types of value: "Provision of high-performance steel products and solutions that contribute to reducing CO_2 emissions in society" and "provision of carbon neutral steel through decarbonizing steelmaking processes." We aim to reduce CO_2 emissions at the time of production and processing by our customers, at the time of use of our products by end consumers; and in the supply chain of our customers.

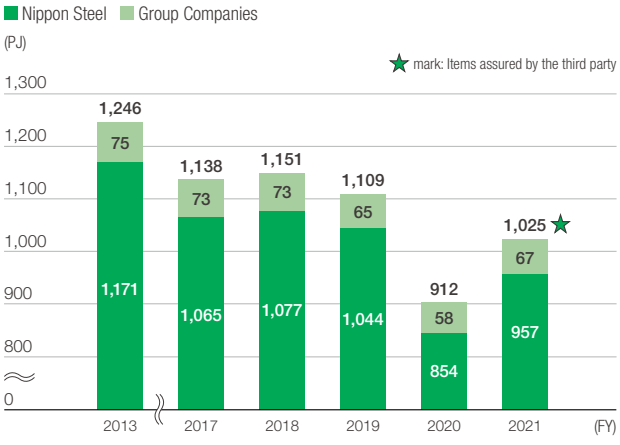
In addition, Nippon Steel by itself as well as the Nippon Steel Group including consolidated crude steelmaking companies that have blast furnaces and electric furnaces with high CO_2 emissions have set a target for 30% reduction in CO_2 emissions in 2030 compared to 2013. Also, our major domestic consolidated subsidiaries aim to be carbon neutral in 2050. Our overall Group will work together to tackle climate change issues.

Nippon Steel Group's energy consumption and energy-derived CO_2 emissions

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

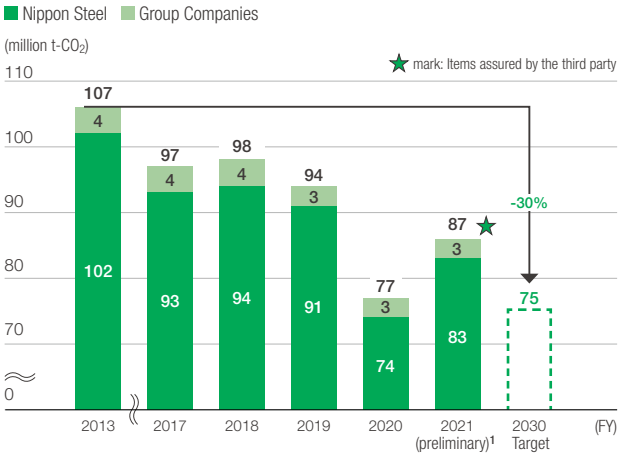
In fiscal 2020, energy consumption and energy-derived CO_2 emissions decreased significantly mainly due to the impact of the COVID-19 pandemic. In fiscal 2021, as we implemented energy-saving measures while the production volume is recovering, our energy consumption and energy-derived CO_2 emissions increased to 1,025 petajoules (PJ) and 87 million tons (preliminary) respectively.

Energy consumption[5]



[Calculation method]
Calculation for the Company and its domestic subsidiaries is based on the Carbon Neutrality Action Plan.
Overseas subsidiaries follow local regulations or guidelines for calculation.
[Conversion factor]
The Company and its domestic subsidiaries use the "Table of heat generation and carbon emission coefficient by energy source" (revised January 31, 2020) of the Agency for Natural Resources and Energy, METI.
Overseas subsidiaries use relevant emission factors according to local regulations or guidelines.
[Boundary of data collection]
Nippon Steel[2, 3], associated EAF mills (Osaka Steel, Sanyo Special Steel, Nippon Steel Stainless Steel, Oji Steel, Tokai Special Steel, Nippon Steel Structural Shapes Corporation, Tokyo Kohtetsu, Ovako, Sanyo Special Steel Manufacturing India, and Standard Steel), and three Sanso Center companies[4]
The data collection period used is each company's accounting period. As Ovako has changed its fiscal year end, Ovako's fiscal 2021 results cover a period from January 1, 2021 to March 31, 2022 (15 months).

Energy-derived CO_2 emissions[5]



1 Preliminary figure: The amount of CO_2 per unit of purchased electricity from each of general power companies in Japan in fiscal 2021 is assumed to be the same amount as in fiscal 2020.
2 Excluding energy consumption and CO_2 emission associated with the IPP operation by the steelworks
3 The amounts of energy consumption required for production of coke purchased by Nippon Steel and CO_2 emissions are included in the aggregate.
4 Concerning the three Sanso Center companies, the amount of energy consumption required for production of oxygen purchased by Nippon Steel Group and CO_2 emissions are included in the aggregate.
5 According to the change in the boundary of data collection, the amounts of energy consumption and CO_2 emissions in the past years have been revised retroactively.

CO_2 emissions in the value chain

CO_2 emissions originated from energy source and generated in Nippon Steel's manufacturing process (Scope 1 and Scope 2) as well as CO_2 emissions in the value chain (Scope 3), which are calculated by using the Green Value Chain Platform of the Ministry of the Environment and other methods are as follows.

Scope 1 and 2

★ marks: Items assured by the third party

(FY)	CO_2 emissions (thousand tons-CO_2) 2013	2017	2018	2019	2020	2021	Calculation method
Scope 1 Direct emissions from owned sources associated with use of fuel	89,578[10]	80,728[10]	81,337[10]	78,584[10]	62,987[10]	**71,292** ★	Based on the Carbon Neutrality Action Plan. See the boundary of data collection stated below.
Scope 2 Indirect emissions from the generation of purchased energy	13,825[10]	12,968[10]	12,850[10]	12,091[10]	11,035[10]	**12,478**[8] ★	
Scope 1 + 2	103,403[10]	93,696[10]	94,187[10]	90,675[10]	74,022[10]	**83,770**[8] ★	
(Energy consumption per ton of crude steel: t–CO_2/t)	1.89	1.89	1.89	1.93	1.97	**1.88**	
Crude steel production (consolidated-base, 10,000 tons)	5,474	4,968	4,990	4,709	3,766	**4,445**	

[Conversion factor]
The Company and its domestic subsidiaries use the "Table of heat generation and carbon emission coefficient by energy source" (revised January 31, 2020) of the Agency for Natural Resources and Energy, METI.
Overseas subsidiaries use relevant emission factors according to local rules or guidelines.
[Boundary of data collection]
Nippon Steel[9] and associated EAF mills (Osaka Steel, Sanyo Special Steel, Nippon Steel Stainless Steel, Oji Steel, Tokai Special Steel, Tokyo Kohtetsu, Nippon Steel Structural Shapes Corporation, Ovako, Sanyo Special Steel Manufacturing India, and Standard Steel). The data collection period used is each company's accounting period. As Ovako has changed its fiscal year end, Ovako's fiscal 2021 results cover a period from January 1, 2021 to March 31, 2022 (15 months).

8 Preliminary figure: The amount of CO_2 per unit of purchased electricity from each of general power companies in Japan in fiscal 2021 is assumed to be the same amount as in fiscal 2020.
9 Excluding CO_2 emission associated with the IPP operation by the steelworks.
10 The breakdown of Scope 1 and Scope 2 of the past years are according to the changed boundary of data collection and retroactively revised.

Scope3

★ mark: Items assured by the third party

(FY)	CO_2 emissions (thousand tons-CO_2) 2019	2020	2021	Calculation method
Scope 3 All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company				
1 Purchased goods and services	17,063[11]	14,379[11]	**15,994** ★	Calculated using method[12] below for purchased iron ore, coking coal, coke, and oxygen
2 Capital goods	1,656	1,632	**1,400**	[Amount of capital expenditures] X [Emission factor]
3 Fuel and energy related activities not included in Scope 1 or 2	305	291	**338**	[Amount of electric power procured and fuel used] X [Emission factor]
4 Upstream Transportation and Distribution	683	629	**710**	[Transportation distance reported in the Energy Saving Law document] X [Emission factor]
5 Waste generated in operations	5	4	**5**	[Amount of waste] X [Emission factor]
6 Business travel	4	4	**4**	[Number of employees] X [Emission factor]
7 Employee commuting	13	14	**14**	[Number of employees] X [Emission factor]
15 Investments	1,208	1,125	**1,053**	[Emissions by subsidiaries and affiliates that emit GHG of over 10,000 tons] X [Equity stake of each company]

[Source of emission factor]
"Emissions unit value database for accounting of greenhouse gas emissions throughout the supply chain (ver. 3.2)" (March 2022, Ministry of the Environment)
"Table of heat generation and carbon emission coefficient by energy source" (Revised January 31, 2020; METI, Agency for Natural Resources and Energy)

[Boundary of data collection] Nippon Steel
11 Past figures are retroactively revised according to the change in calculation method.
12 Iron ore and coal: [Amount purchased of procured iron ore and coal] X [Emission factor]
Coke: [Amount purchased of procured coal at source] X [Emission factor] + [Amount of energy used in production of coke] X [Emission factor by energy source]
Oxygen: [Amount of energy used in production of oxygen] X [Emission factor by energy source]

Example of Scope 3 efforts: CO_2 emission reduction by raising efficiency in logistics

Nippon Steel maintains a high modal shift rate[13] of 97% and works at reducing CO_2 emission by raising efficiency in logistics, such as by use of large vessels. As part of the efforts, we have begun to use "*Utashima*" — a hybrid-type cargo vessel, equipped with lithium-ion batteries. This vessel was awarded the Small Cargo Vessel Award of the Ship of the Year 2019[14]. In March 2022, our three cargo vessels were rated the highest in the Coastal Ship Energy Conservation Rating of the Ministry of Land, Infrastructure, Transport and Tourism.

We have also decided to introduce cargo vessels equipped with a hybrid propulsion system consisting of a natural gas-fueled engine and battery, for marine transportation of domestic raw materials.

Hybrid Cargo Ship "*Utashima*" equipped with lithium-ion batteries

We will continue to cooperate with relevant ministries, agencies, and organizations to promote use of ships utilizing alternative fuels, in order to reduce greenhouse gas emissions in marine transportation.

Logistics sector's ton-kilometer[15] achievements for FY2021

(Reference)

	Transportation quantity: 10,000 tons/year		Million ton-kilometers/ year		g-CO_2/ ton-kilometers
Ship	1,861	(56%)	13,407	(91%)	39
Railway	6	(0%)	39	(0%)	25
Truck and trailer	1,451	(44%)	1,266	(9%)	211
Total	3,318	(100%)	14,712	(100%)	

13 Modal shift rate: Modal shift means replacing a means of transport from trucks to trains and ships. The modal shift rate, according to the definition by the Ministry of Land, Infrastructure, Transport and Tourism, is a ratio of volume transported by trains and marine transportation (including ferries) in long distance transport of over 500 km.
14 Award by the Japan Society of Naval Architects and Ocean Engineers
15 Ton-kilometer: Total sum of the weight of load (ton) transported multiplied by transport distance (km). The reference amounts (in grams) of CO_2 emissions per ton-kilometer travelled are the average for all industries (Ministry of Land, Infrastructure, Transport and Tourism)

Promotion of Climate Change Measures

Promotion of Carbon Neutral Vision 2050

When Nippon Steel announced its Carbon Neutral Vision 2050 in March 2021, the Company positioned climate change issues as the priority management challenge for the Medium- to Long-Term Management Plan.

We have taken up the challenge to achieve carbon neutrality in 2050, and are striving to reduce CO_2 in our value chain by providing two types of value: by providing high-performance steel products and solutions that contribute to reducing CO_2 emissions throughout society, and by providing carbon neutral steel through decarbonization of the steelmaking process.

Providing two type of values targeted by the Carbon Neutral Vision 2050

NIPPON STEEL

In support of the ambitious government policy to realize a carbon neutral society in 2050, we announced the Carbon Neutral Vision 2050 as a part of the Medium- to Long-Term Management Plan in March 2021.

Providing two types of values by achieving carbon neutrality

Provision of high-performance steel products and solutions that contribute to reducing CO_2 emissions in society

eco PRODUCTS

- Reduce CO_2 emissions at the time of production and processing by customers
- Reduce CO_2 emissions at the time of use of our products by end customers

Decarbonization of steelmaking process for providing carbon neutral steel

eco PROCESS

- Reduce CO_2 emissions in customers' supply chains

By providing high-performance steel products and solutions, and by decarbonizing steelmaking process ahead of other countries, we are determined to provide carbon neutral steel to our customers (including approximately 6,000 companies in Japan) and support their international competitiveness.

NET ZERO

NIPPON STEEL
Green Transformation
initiative

Providing high-performance steel products and solutions that help reduce overall CO_2 emissions

eco PRODUCTS

In addition to promoting drastic technological innovation in the steelmaking process, we are contributing to the realization of a carbon neutral society in Japan by providing high-performance steel products (Eco-Products) that help customers save energy and that reduces CO_2 emissions when using final products.

Specifically, in response to the growing demand for electrical steel sheets that reduce energy loss for motors of electric vehicles and transformers, and demand for higher grade steel products, we have decided to implement measures to improve the capacity and quality of electrical steel sheets and are currently investing ¥123 billion in total in the Kyushu Works Yawata Area and Setouchi Works Hirohata Area.

In addition, in response to the growing demand for ultra-high-tensile steel sheets that improve automobiles by the combination of lighter weight and higher strength, we have also begun to establish a new-generation hot-rolling mill in the Nagoya Works. We will continue to provide high-performance steel products and solutions that are compatible with this carbon neutral initiative, contributing to the reduction of CO_2 emissions in production and processing by our customers and in the use phase of our products by end consumers.

Improvement of the capacity and quality of electrical steel sheets

As the world is rapidly moving toward decarbonization, regulations concerning energy efficiency of transformers have been tightened in a number of countries. With regard to grain-oriented (GO) electrical steel sheets used in the iron core of transformers, the need for higher-grade materials with less energy loss is anticipated to further increase. In the meantime, demand for high-efficiency high-grade non-oriented (NO) electrical steel sheets used in the iron core of electric vehicles (EVs) is also expected to dramatically increase, driven by accelerated growth in demand for EVs, along with the stricter regulations for CO_2 emissions and average fuel economy for vehicles.

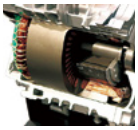
In order to respond quickly to this accelerating need, we decided to invest a total of ¥123 billion to improve the capacity and quality of electrical steel sheets at the Kyushu Works Yawata Area and the Setouchi Works Hirohata Area, and have been working to make this investment fully effective by the first half of fiscal 2024.

Social demand for carbon neutrality

Demand growth and performance improvement of EV motors
(Higher efficiency, smaller size and lighter weight)

Stronger regulations for higher efficiency transformers worldwide

Non-Oriented (NO) electrical steel sheets ⇒ for motors



Supply of high-grade electrical steel sheets as the most economical means to meet these demands

Grain-Oriented (GO) electrical steel sheets ⇒ for transformers

Currently investing in measures for the improvement in capacity and quality (1.5X increase in NO + GO capacity including 3.5X increase in high-grade products) in order to both meet the growing demand for electrical steel sheets that reduce energy loss of motors and transformers, and satisfy demand for higher grade products

Considering additional capacity measures to cope with the growing demand for higher grade products, assuming accelerating shift toward EVs and carbon neutral energy transformation for achieving carbon neutrality

Construction of a next-generation hot strip mill and production of ultra-high-tensile steel sheets

In the automotive industry, where global environmental regulations are showing a trend of tightening and where crashworthiness standards are becoming more stringent, demand for high-performance materials is expected to further grow in response to the need for lighter, stronger vehicle bodies.

For the foreseeable future, demand for electric and hybrid vehicles will have high growth potential, increasing needs for lighter and stronger vehicle bodies that support extended travel distance, heavier battery weight, and higher safety.

In response to these needs, we have decided to make strategic investment in a next-generation hot strip rolling mill (production capacity: approximately 6 million tons/year: commissioning in the first quarter of fiscal 2026) as a means of fundamentally strengthening our production system for ultra-high-tensile steel sheets and other high-performance steel sheets at the Nagoya Works — our core base for manufacturing automotive steel sheets.

Social demands for the carbon neutrality

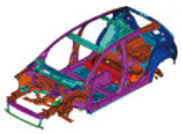
More stringent fuel economy regulations for conventional internal combustion vehicles

Demands for lighter weight associated with electrification of vehicles (mileage, battery weight)

Social demands for safety

Stricter crashworthiness standards

Growing needs for ultra-high-tensile steel sheets, which are both **lighter and higher in strength, and have a higher level of workability**



In order to drastically strengthen the production system of high-performance steel sheets such as ultra-high-tensile steel sheets at the Nagoya Works, a core base for automobile steel sheet manufacturing, we are combining the knowledge and experience of many years' R&D in pursuit of the potential of steel materials and are **constructing a next-generation hot strip rolling mill** with the world's largest load-bearing rolling machine, which will give us dramatically improved rolling control and temperature control.

Examples of high-performance steel materials for achieving a carbon neutral society

HYDEREXEL™ stainless steel for high-pressure hydrogen environments

Iwatani Hydrogen Refueling Station in Ariake, Tokyo
Photo by Iwatani Corporation

Stainless steel for hydrogen infrastructure with enhanced strength and workability

Contributing to social dissemination of next-generation energy use

Steel for high-strength gears

Reduction of manufacturing process steps, and weight reduction by increasing the strength of the material

CO_2 emissions reduction during production
Improved fuel economy

Promotion of Climate Change Measures

Decarbonization of steelmaking process for providing carbon neutral steel

We have formulated a target of reducing total CO_2 emissions by 30% by 2030, compared to the 2013 baseline and of achieving carbon neutrality in 2050. We are working to develop and actually implement breakthrough technologies in steelmaking process ahead of steel companies in other countries.

Our plan is ambitious compared to those of our global peers, and is intended to significantly contribute to the Japanese government's plan. With the assistance of the Green Innovation Fund[1], we are working on specific plans of the roadmap of development and practical implementation.

1 Commissioned and grant projects of New Energy and Industrial Technology Development Organization (NEDO), which supports companies to carry out projects aimed at achieving ambitious targets for 2030 in focused areas of the Japanese Government's Green Growth Strategy, such as CO_2 emission reduction.

Our CO_2 emissions reduction scenario

2030 Target

30% or more reduction in total CO_2 emissions vs. 2013

30% reduction in total CO_2 emissions vs. 2013 by implementing the COURSE50[2] in the existing BF and BOF process, reducing CO_2 emissions in existing processes, and establishing an efficient production framework.

2 COURSE50: Abbreviation for CO_2 Ultimate Reduction System for cool Earth 50

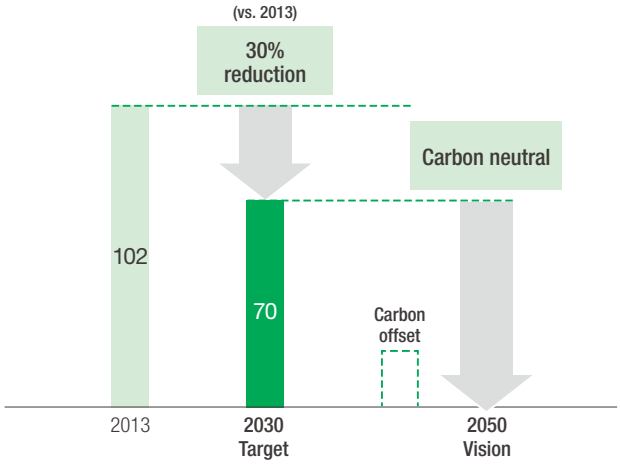
Vision 2050

Ambition to become carbon neutral

Ambition to become carbon neutral by taking up the challenge to mass produce high-grade steel in large size EAFs and to realize hydrogen steelmaking (i.e., Super COURSE50 use of BFs; direct reduction with 100% hydrogen), and with multi-aspect approach, including CCUS[3] and other carbon offset measures.

3 Carbon Capture, Utilization and Storage

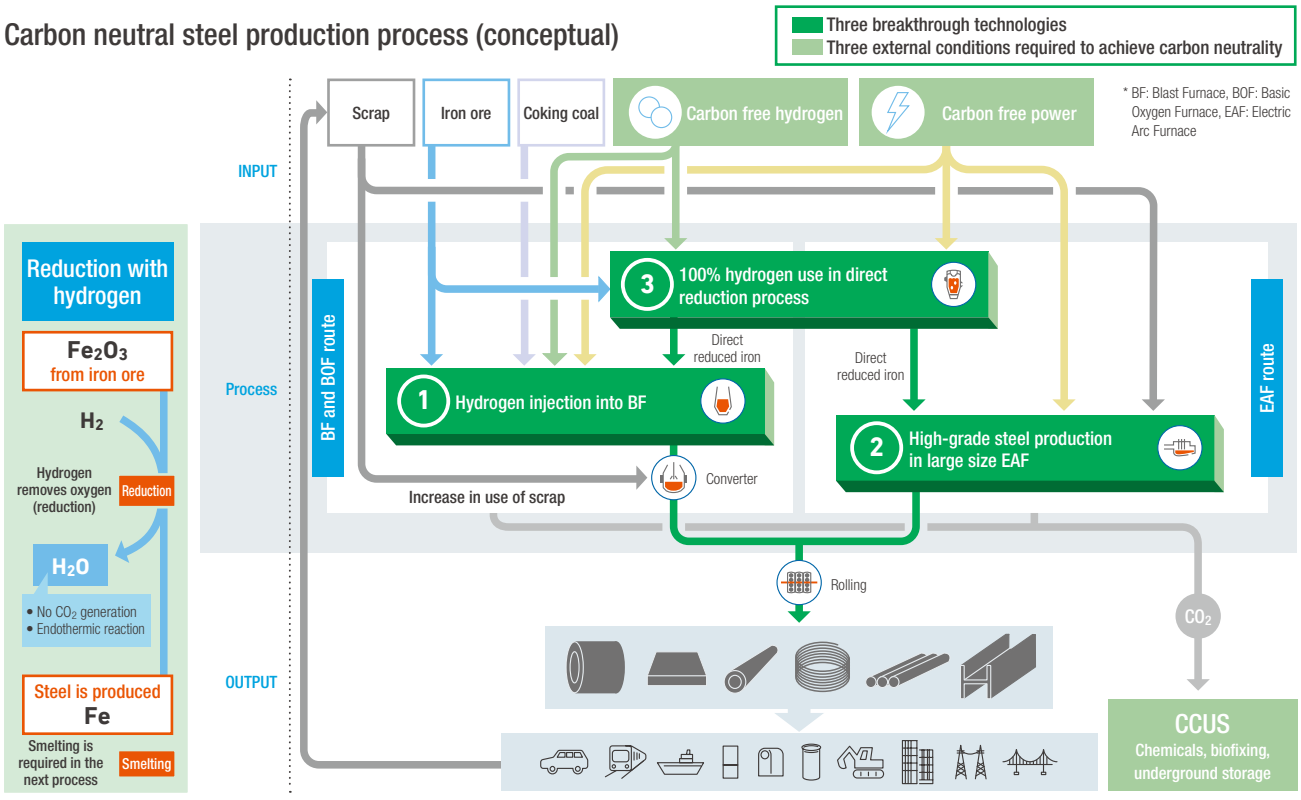
Total CO_2 emissions (million tons/year)[4]



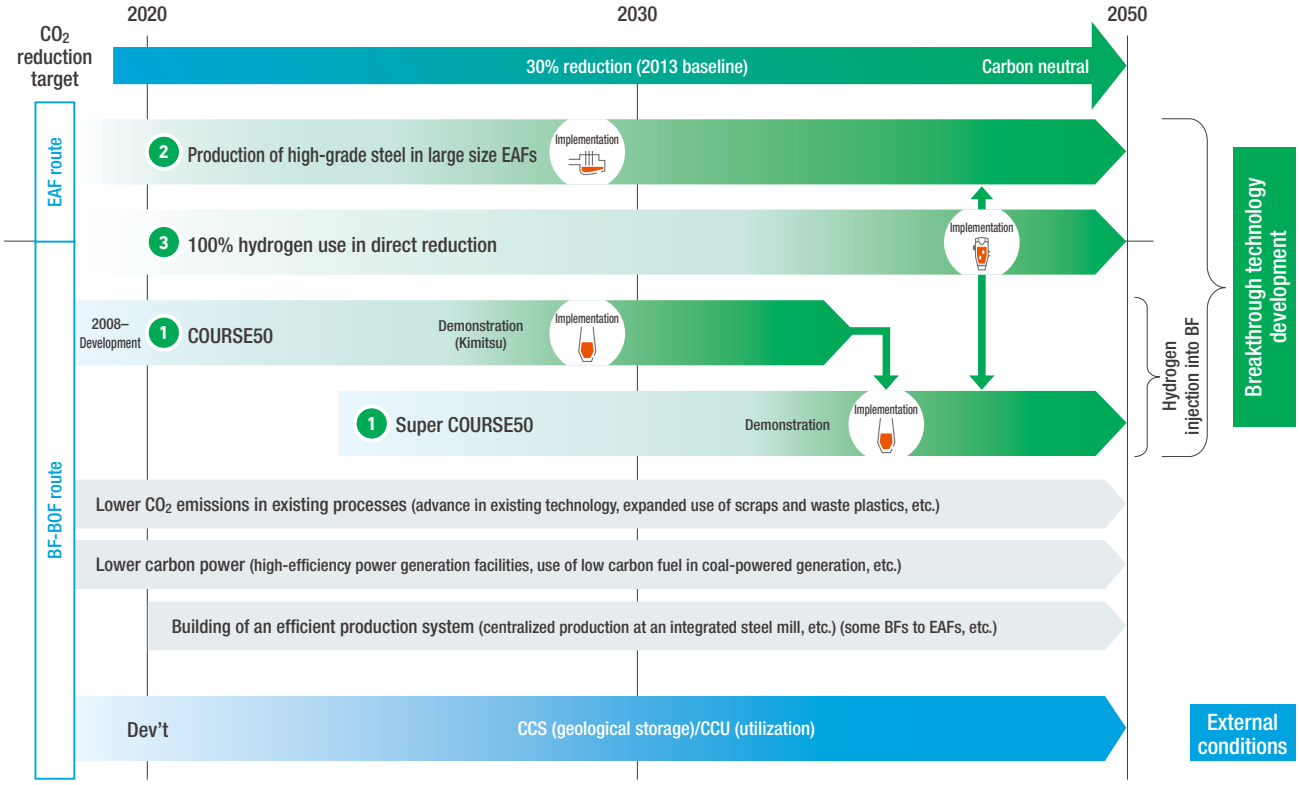
[Scope of scenario]
Domestic
SCOPE 1+2 (direct emissions in our production sites + indirect emissions from purchased electricity)

4 Including Nippon Coke & Engineering Co., Ltd. and Sanso Center Co., Ltd.

Carbon neutral steel production process (conceptual)



Roadmap to achieve the Carbon Neutral Vision



* BF: Blast Furnace, BOF: Basic Oxygen Furnace, EAF: Electric Arc Furnace

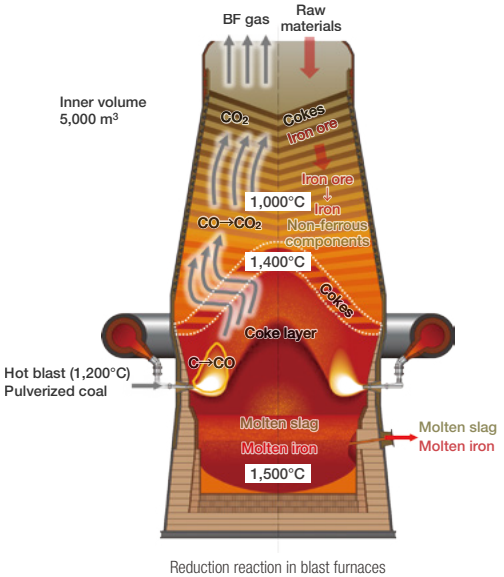
Technical Issues for realizing a carbon-neutral production process

In nature, iron exists as oxidized iron ore. To produce steel products, oxygen must be removed (= reduced) from iron ore. This reduction process has been carried out by the blast furnace (BF) and the basic oxygen furnace (BOF), using carbon such as coal.

In this process, coal (coke) is 1) a reducing agent, 2) a source of heat, and 3) plays a role to support the function of raw materials at high temperature in a solid form while facilitating to maintain ventilation in the furnace. Although the coal (coke) has been utilized in a continuous, efficient steelmaking from iron ore, CO_2 is inevitably generated during the reduction reaction.

We are therefore drastically reviewing this process and plans to reduce CO_2 emissions by replacing coal (coke) as a reducing agent with hydrogen to produce H_2O instead of carbon in the reduction.

However, as reduction with hydrogen is an endothermic reaction, the temperature drop in the furnace causes problems such as the reaction not being sustained and the iron not melting. In order to realize hydrogen steelmaking, we are tackling these problems by development of breakthrough technologies such as 1) high-temperature heating of flammable hydrogen, 2) securing of gas flow in the furnace, 3) additional melting process, and 4) large-scale production for production.



Reduction reaction in blast furnaces

Reduction with carbon

$Fe + O \xrightarrow{C} Fe + CO_2$

- Generating CO_2
- Due to the exothermic reaction, 1) the reaction is sustained and 2) the iron is melted at high temperature, and the composition can be easily adjusted

Reduction with hydrogen

$Fe + O \xrightarrow{H_2} Fe + H_2O$

- Generating H_2O (steam)
- Due to the temperature drop in the furnace, 1) the reaction is not sustained and 2) produced iron does not melt

Reduction with carbon vs. hydrogen

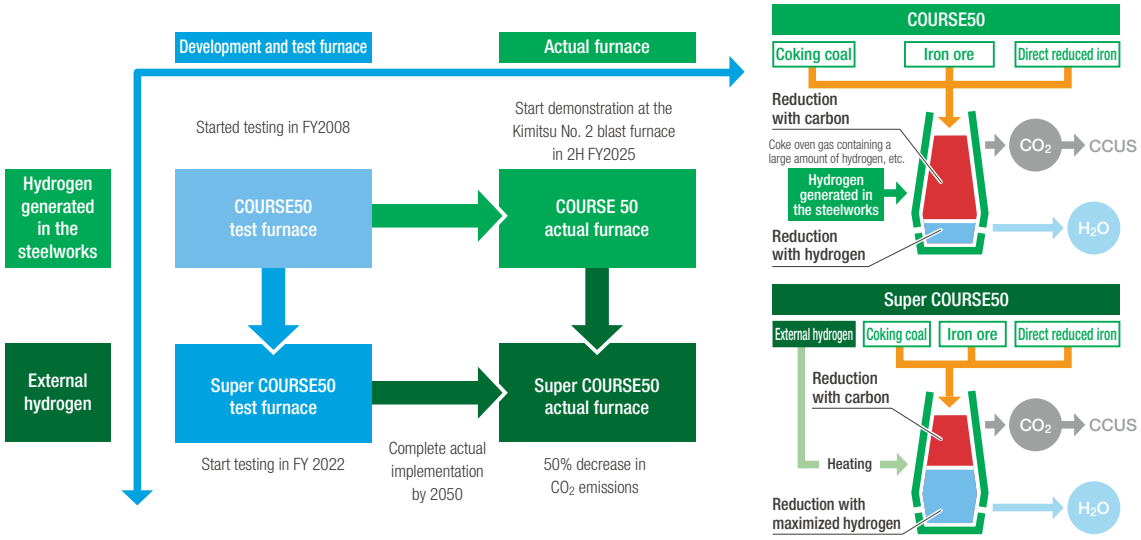
Promotion of Climate Change Measures

Challenge of developing breakthrough technologies

1 Reduction with hydrogen in blast furnaces

Japan's three blast furnace steelmakers and Nippon Steel Engineering have been developing the COURSE50 blast furnace, which partially replaces carbon used in the furnace as a reducing agent with the hydrogen-rich gas generated in the integrated steel mill. We have already verified that the technology can reduce CO_2 emissions in the test furnace. We plan to start demonstration of the COURSE50 at Kimitsu No. 2 blast furnace in the second half of fiscal 2025 as a Green Innovation Fund project.

Our subsequent plan is to install a working COURSE50 blast furnace by fiscal 2030, work on solving the issues related to the endothermic reaction and the scale-up of the furnace, and to develop the Super COURSE50 technology so that we can reduce the blast furnace CO_2 emissions by 50% using additional hydrogen from outside. The goal is completion of the implementation by 2050.



COLUMN

The COURSE50 Project (Environment-friendly process technology development)[1]

Since 2008, the COURSE50 Project has been developing technologies to lower CO_2 emissions by 30%: a 10% lowering emissions from a blast furnace by adopting technologies to reduce iron ore by use of hydrogen and a 20% offset by CO_2 capture from BF gas. In the hydrogen steel making, a 10% reduction of CO_2 emissions has been verified at a 12 m^3 experimental blast furnace at the Kimitsu Area of the East Nippon Works and we also undertook simulation for the size of an actual blast furnace, moving the project closer to adoption of this innovative reduction technologies in commercial-use blast furnaces.

COURSE50 Project by NEDO and JISF

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

The Super COURSE50 Project[2]

The COURSE50 project focuses on the technology for reducing the amount of carbon to be injected into blast furnaces. This is done by using by-product gas generated in integrated steel mills, which is currently used in furnaces. The project aims at realizing the hydrogen steelmaking in some degree, given the current circumstances, under which there is no social infrastructure for supplying large volumes of hydrogen. For achieving the Carbon Neutral Vision, however, we should be ready for the time when the infrastructure can provide sufficient hydrogen supply. We then need to take up the challenge for Super COURSE50 — a project to reduce the amount of carbon in the blast furnace by purchasing hydrogen from outside the steel mill and further increasing the amount of hydrogen injection into the furnace.

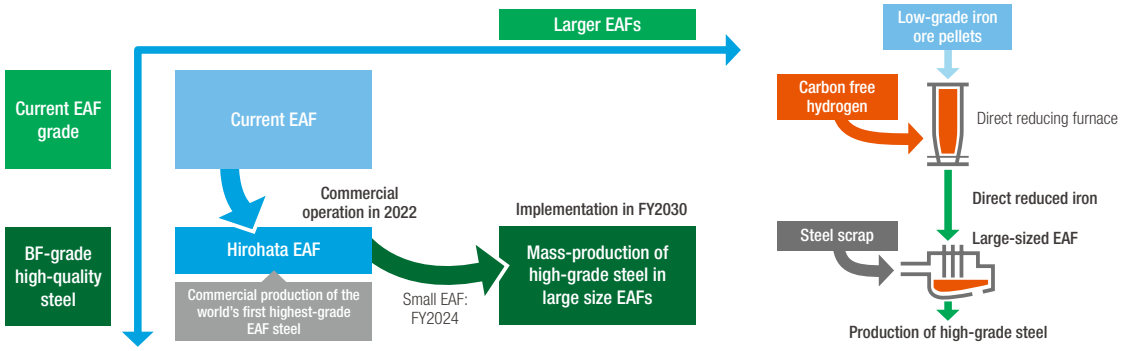
In fiscal 2020 we started R&D for the Super COURSE50 project, as part of the program for technology development for achieving zero carbon steel research, at NEDO. The project became a Green Innovation Fund project in 2021.

2 The Green Innovation Fund "Hydrogen utilization in iron and steelmaking processes" project (NEDO's R&D outsourcing support and assistance project)

2 High-grade steel production in large-sized EAFs

In fiscal 2022, the new electric arc furnace (EAF) started commercial operation at the Setouchi Works Hirohata Area, and we will accumulate knowledge of high-grade steelmaking in an EAF through the commercial production of electrical steel sheet in this world's first such integrated steelmaking arrangement. At the same time, we are developing high-grade steelmaking technology in large electric furnaces in a Green Innovation Fund project. As a part of the project, we will set up a small EAF (capacity: 10 tons) in the Hasaki R&D Center and start experiments in fiscal 2024.

Our subsequent plans are to establish technology to produce high-grade steel that can be used for automobile outer panels, by using direct reduced iron with hydrogen from low-grade iron ore and also using steel scrap as materials. By controlling the impurity concentration using a large-sized EAF process (approximately 300 tons in processing volume), similar volume as BF-BOF process, we will establish the technology by fiscal 2030.



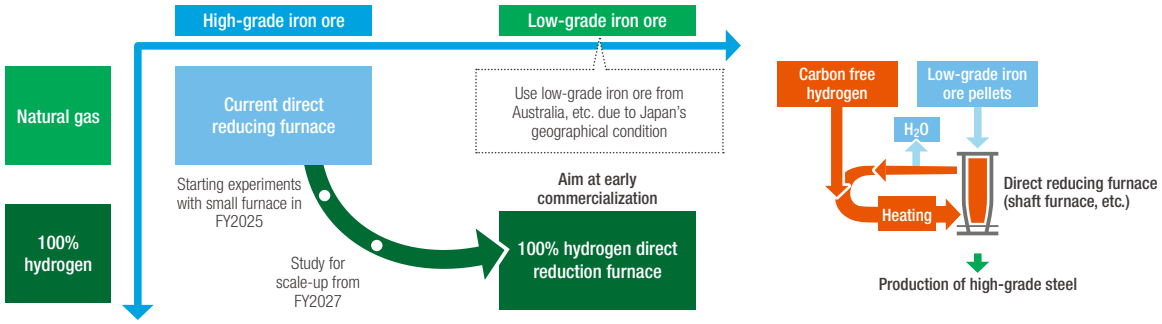
3 100% hydrogen use in direct reduction process

In the 100% hydrogen use in direct reduction, we try zero CO_2 emissions in reduction process by fully using hydrogen as the reducing agent. Since this process produces solid direct reduced iron (DRI), it is necessary to melt it and separate out its gangue component (the material present together with ore) in the subsequent process such as in the blast furnace (BF) or EAF.

Most of the actual direct reduction methods currently use high-grade iron ore, which is not easily broken or sticked to each other, during the reduction process. As the high-grade one is limited to about 10% of iron ore available in the market, we will challenge to use lower-grade iron ore in the process. Current DRI process uses methane (natural gas) as the reducing agent. Methane contains carbon and hence emits CO_2. We try 100% use of hydrogen as the reducing agent in the direct reduction process.

The process, however, has its own high technical issues, too. Since the reduction process with hydrogen is an endothermic reaction, it is necessary to supply heat to maintain the reaction. In addition, in the case of using a shaft furnace, powdering of the raw material pellets, and sticking of produced iron pellets are the problems to be solved.

As a Green Innovation Fund project, we will build a small furnace (10 tons) in the Hasaki R&D Center and start experiments in fiscal 2025. Then, by 2050, we aim to solve issues such as utilization of low-grade iron ore and conversion of reduction material from natural gas to hydrogen, and to commercialize a direct hydrogen reduction reactor using low-grade iron ore from Australia and other countries as feedstock.



COLUMN Efforts toward stable procurement of hydrogen

Nippon Steel has a strong interest in hydrogen from a variety of perspectives, including the fact that we have the potential to become one of Japan's leading hydrogen users in the future (we estimate that the amount of hydrogen needed to be carbon neutral at our company will exceed 7 million tons per year), the need to realize a lower hydrogen price than other industries need[3], and that we are a major supplier of steel for hydrogen infrastructure.

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

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

3 Target hydrogen cost of ¥20/Nm^3 or less in the METI's "Green Growth Strategy through Achieving Carbon Neutrality in 2050," compared to the current hydrogen cost equivalent to coking coal of approx. ¥8/Nm^3.

Promotion of Climate Change Measures

Efforts to reduce carbon emission in power generation

We generate 89% of the electricity we use at steelworks, 75% of which is from internally generated energy sources such as waste heat and by-product gases. We also use LNG, petroleum, and coal as external-source auxiliary fuels. Therefore, in order to reduce the carbon content of our electric power structure, we will eliminate all use of inefficient coal-fired power, increase efficiency of thermal power fired by by-products, and utilize CCUS. We will also consider use of non-fossil fuels for external auxiliary fuels (expanded use of zero-emission fuels such as biomass, ammonia, and hydrogen) and purchase of green power.

Issues to consider and promote reducing carbon in the electric power structure

- Total elimination of inefficient coal-fired power
- Increase efficiency in thermal power fired by by-products, utilization of CCUS, and use of non-fossil fuels for external auxiliary fuels (expanded use of zero-emission fuels such as biomass, ammonia, and hydrogen)
- Purchase of green power

CCUS technology development

CCUS (Carbon Capture, Utilization and Storage) is a technology that separates, captures, and stores CO_2 in the ground, or directly uses CO_2 or converts it into other materials and utilizes it. In the carbon neutral steel production process, CCUS technology is used to process CO_2 still generated from the steelmaking process even after it has been minimized.

Realization of this technology requires the related technology development as well as preparation of external conditions. The required technologies include development and installment of CO_2 separation and recovery technology (high-performance chemical adsorption liquid) and development of CO_2-based manufacturing technologies for chemicals and fuels. The necessary external conditions include the securing of the storage space, the establishment of the storage infrastructure for CCS, legislation, and tax incentives, the ensuring of business profitability of chemicals and fuels manufactured by CCU (Carbon Capture and Utilization), and preferential treatment of carbon recycled products. The Nippon Steel Group is aggressively engaged in developing these technologies to help realize social implementation of CCUS.

Nippon Steel Group's CCUS technology development efforts

Capture

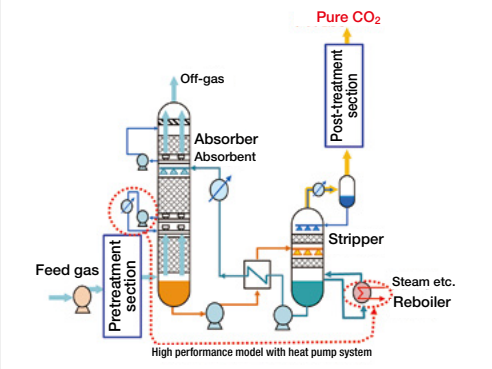
CO_2 Separation and Recovery Technology

(subsidized by the Green Innovation Fund)

Nippon Steel Engineering Co. in the Nippon Steel Group has commercialized an energy-saving CO_2 chemical absorption process called ESCAP™ (Energy Saving CO_2 Absorption Process), which uses chemical absorption, one of the methods for CO_2 separation and recovery. Two units are already in operation in Japan, including the one installed in the North Nippon Works Muroran Area.

The ESCAP™ is characterized by high energy efficiency with a more than 40% reduction in heat consumption compared to general-purpose technology. In addition, its proprietary impurity removal facility enables recovery of more than 99.9% of high-purity CO_2 from raw material gas with high impurities.

In recognition of this high energy efficiency and practicality, Nippon Steel, Nippon Steel Engineering, and the Research Institute of Innovative Technology for the Earth (RITE) received the Ichimura Global Environmental Industry Award for Contribution for this joint development in fiscal 2021.



Flowsheet of ESCAP™

Transportation

CO_2 Transport Vessel Technology

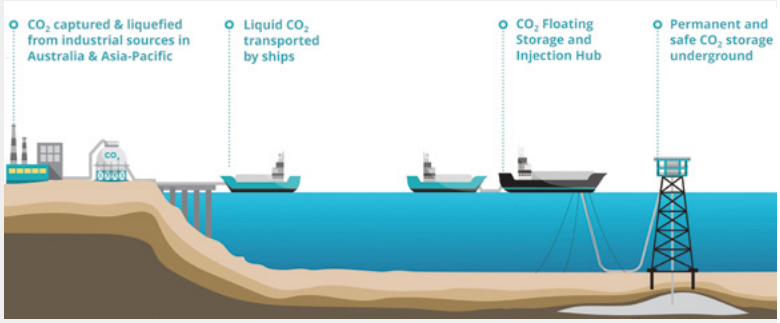
(subsidized as the NEDO Project)

Jointly with Japan CCS Co., Engineering Advancement Association of Japan, and ITOCHU Corporation, we have commenced the R&D and demonstration project related to a CO_2 transport vessel.

Storage

CO_2 storage technology

Nippon Steel and deepC Store Limited signed a joint study agreement concerning the liquefaction, maritime transport and storage of CO_2 in the hub project (C Store1) of large-scale offshore floating capturing and transporting of liquefied CO_2.



©deepC Store Limited

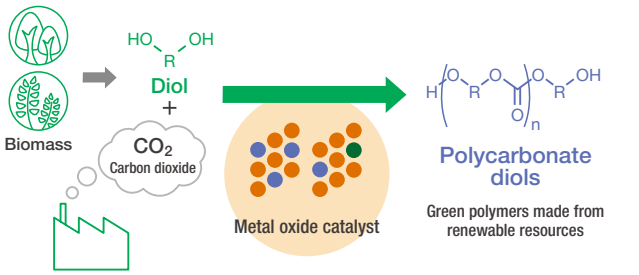
Utilization of steel for CO_2 storage

- Nippon Steel's high-alloy seamless steel pipes, with high corrosion resistance even in a high-density CO_2 environment, are used in the CCS project in the European North Sea and in the wells of a joint research on CO_2-based technologies for the promotion of crude oil recovery in Agano City, Niigata Prefecture.

Utilization

Manufacturing technology of chemical products made from CO_2
(subsidized by the Green Innovation Fund)

- Nippon Steel and Toyama University are jointly developing a catalytic technology to synthesize CO_2 and hydrogen, and produce industrial paraxylene, a feedstock material for polyesters such as polyester fibers and plastic bottles.
- Nippon Steel, Tohoku University, and Osaka City University are jointly developing a catalytic process to synthesize polycarbonate intermediates from CO_2 at normal pressure.



Absorption and fixation by marine life
(subsidized as the NEDO Project)

- Develop and commercialize technology to create seaweed beds (blue carbon ecosystem) by using fertilizers made of steel slag, a by-product of steelmaking, in coastal areas.

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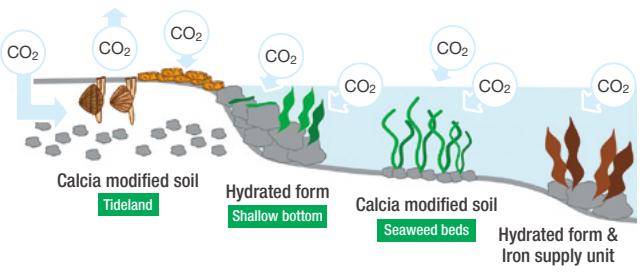


An organizational structure for achieving carbon neutrality

The Green Transformation Promotion Committee has been established to consider and implement measures for the development and practical application of breakthrough technologies, which are key to achieving carbon neutrality, ahead of peers in other countries, as the priority management issue. The Committee has all five Executive Vice Presidents as its members.

In April 2021, the committee established a project for approximately 60-70 people to consider carbon neutral technologies of various fields. In April 2022, it was reorganized as a permanent organization under the name of the Green Transformation Development Sector, and has augmented by additional persons to the level of approximately 90 people.

Structure for promoting green transformation

(Head Office)

- Corporate Planning Div., Accounting & Finance Div., General Administration Div.
- Environment Div., Technical Administration & Planning Div.
- Plant Engineering and Facility Management Center
- Ironmaking Technology Div., Steelmaking Technology Div.
- Energy Technology Div.
- Marketing Administration & Planning Div.
- Raw Materials Div.-I, Raw Materials Div.-II
- R&D Laboratories
- R&D Planning Div.
  - Steel Research Laboratories
  - Advanced Technology Research Laboratories
  - Process Research Laboratories
- Global Business Development Dept.

Collaboration

Board of Directors

Management Committee

Green Transformation Promotion Committee

Five Representative Directors and Executive Vice Presidents, one Managing Director, three Managing Executive Officers including six Members of the Board, and 20 General Managers in charge of Corporate Planning, General Administration, Legal, Human Resources, Raw Materials, Accounting & Finance, Environment, Marketing Administration & Planning, Technical Administration & Planning, Plant Engineering and Facility Management, Energy Technology, R&D, Global Business, etc.

Green Transformation Development Sector

- General Planning Div
  - CN Process Procurement Planning Dept.
  - CN Process Planning Dept.-I
  - CN Process Planning Dept.-II
  - CN Process Planning Dept.-III
  - CN Process Planning Dept.-IV
  - CN Process Planning Dept.-V
  - CN Process Planning Dept.-VI

Head of Green Transformation Development: Executive Vice President in charge of Environment

Vice Head of Green Transformation Development: Managing Directors (Corporate Planning, Technical Administration & Planning, Ironmaking Technology, Steelmaking Technology, and Energy Technology) Managing Executive Officer in charge of Environment

Promotion of Climate Change Measures

Collaboration with society, policy proposals, and industry activities to achieve carbon neutrality

Decarbonization of steelmaking is an extremely ambitious challenge. In addition to development of carbon neutral technology options, carbon-free hydrogen and electricity, the CCUS, and other factors of social infrastructure are indispensable.

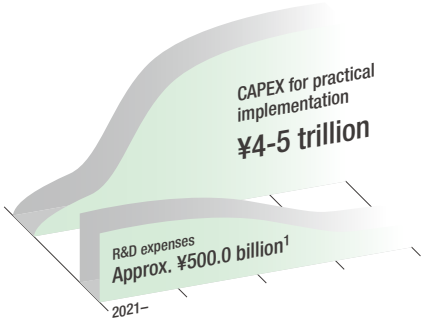
The realization of carbon neutrality in the steel industry is not just a challenge for steelmakers, given that steel as the basic material underpins international competitiveness in manufacturing. It is a national challenge that the whole nation should take it up, based on the policy of aiming at achieving the industry's international competitiveness and carbon neutrality, as well as the national strategy that provides strong, continuous fiscal and other support.

The realization of carbon neutrality in the steel industry requires huge R&D expenditures and capital expenditures for practical use. Nippon Steel alone is expected to roughly require ¥0.5 trillion in R&D expenses and ¥4–5 trillion in capital expenditures. The decarbonizing technology development for the steelmaking process is presenting an appearance of a state-to-state competition. In order to continue to lead the world and maintain and strengthen Japan's overall industrial competitiveness, long-term, continuous government support is indispensable for "discontinuous" innovation and other R&D efforts and equipment implementation.

Europe, the United States, and China have adopted a variety of policies aimed at achieving carbon neutrality on the premise of securing international competitiveness in the steel and other basic materials industries. Japan also needs to introduce a drastic policy system based on national strategy under strong government leadership in order to achieve carbon neutrality ahead of those countries and to maintain and strengthen the international industrial competitiveness.

For realizing these policies, Nippon Steel is determined to take every opportunity to make various proposals on Japan's climate change measures and energy policies based on the Paris Agreement, and to spearhead activities through industry organizations.

Investments needed for the carbon neutral steel project



1 Minimum level estimated to be required for the time being

Policy recommendations for realizing a carbon neutral society

President Hashimoto of Nippon Steel is a member of the Strategic Policy Committee, under the Advisory Committee for Natural Resources and Energy of the Ministry of Economy, Trade and Industry (METI), Vice Chairman of Nippon Keidanren (Japan Business Federation), and a member of the Green Transformation (GX) Implementation Council. The Executive Vice President in charge of Environment is also a member of the Central Environment Council of the Ministry of the Environment, representing Keidanren.

In meetings of these government councils and committees and Keidanren, we express and affirm our commitment and determination of the steel industry for achieving carbon neutrality. We also urge for promptly creating Japan's policy package that combines climate change measures and measures to maintain and enhance international competitiveness of industries, led by the government. In particular, during the deliberations on the government's Clean Energy Strategy, we argued for the need for a policy to change the energy supply structure, including the active promotion of the use of nuclear energy, and to realize carbon neutrality in the materials industry. We have thus contributed to the formulation of the policy. We have strongly advocated the needs for a clear commitment by the government to support the energy-intensive industry, an expansion of the Green Innovation Fund, strong and continuous support in all stages for the decarbonization transition from R&D to equipment implementation, support for the increasing operating costs for hydrogen, electricity, and raw materials, and a roadmap to realize the CCUS.

Moreover, we are actively developing policy proposals to achieve carbon neutrality by making use of all opportunities with the government, relevant ministries and local governments, etc. other than the above-stated councils and committees.

Efforts to address climate change through industry organizations

In February 2021, the Japan Iron and Steel Federation (JISF) announced "Japan's Basic Policy on Carbon Neutrality for 2050" in order to promote Japan's efforts to achieve the mid-term goal of the Paris Agreement. Japan's steel industry has also declared its commitment to boldly take up a challenge for achieving carbon neutrality. In March 2022, we set an ambitious goal of reducing CO_2 emissions from energy-derived sources in fiscal 2030 by 30% compared to fiscal 2013 from an international perspective.

We are also taking a leading role for the JISF to develop climate change measures.

In addition, we participate in climate change action of the global steel industry, which is led by the World Steel Association, and is selected as the worldsteel Climate Action data provider for calculating and reporting CO_2 emissions of steel mills using a common global method.

Activities to transfer and diffuse decarbonization technologies overseas

ECO SOLUTION

With the understanding that the transfer of Japan's advanced energy-saving technologies overseas can be effective ways to globally reduce CO_2 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 1 joint meetings of public and private steel-related parties, 2 preparation of customized list of technologies, and 3 assessment of steelworks as to energy-saving status. These are the three pillars of collaboration for bilateral energy-saving and environmental cooperation with India, Southeast Asia, and other countries and regions.

1 Joint meetings of public and private steel-related parties

In public-private steel-related joint meetings, we share the Technologies Customized List, the results of assessment of steel mills, and introduce detailed technical information and financing schemes, in order to realize the early transfer of energy-saving technologies to emerging countries. By fiscal 2021, joint meetings have been held: 10 times in India and 14 times in six ASEAN countries. In 2021, we held the "2021 Public and Private Collaborative Meeting between Indian and Japanese Iron and Steel Industry" with India and the online "AJSI Webinar 2021" conference with ASEAN countries and shared examples of energy saving and environmental conservation measures.

2 The technologies customized list

We identify the appropriate technologies for each country and region, and in addition to detailed technical information, we conduct the assessment of steel mills, and provide the Technologies Customized List, which complies information such as on suppliers, for reference. In fiscal 2021 the technologies customized list was updated into the fifth version on blast furnace (BF) steelmaking and the 4.2 version on electric arc furnace (EAF) steelmaking for India, and into the fourth version on BF steelmaking and 3.2 version on EAF steelmaking for the ASEAN countries.

Technologies customized list

3 Assessment of steelworks

Experts from the Japanese steel industry visit the steel mills overseas to propose energy-saving technologies, provide operational improvement advice based on the operational conditions of the facilities, and conduct the energy-saving assessment of steel mills using the international standard ISO14404. Up to fiscal 2021, we had carried out the assessment of 13 steel mills in India and 15 mills in six ASEAN countries.

Assessment of steelworks

Activities as a Climate Action member

Nippon Steel participates in the Climate Action Program of the World Steel Association, which uses universal methods to calculate and report on the CO_2 emitted by steelworks. As a Climate Action member (data provider), our 15 years of contribution has been highly recognized.

Climate Action DATA PROVIDER certificate

Contribute to reduction of CO_2 emission on a worldwide scale

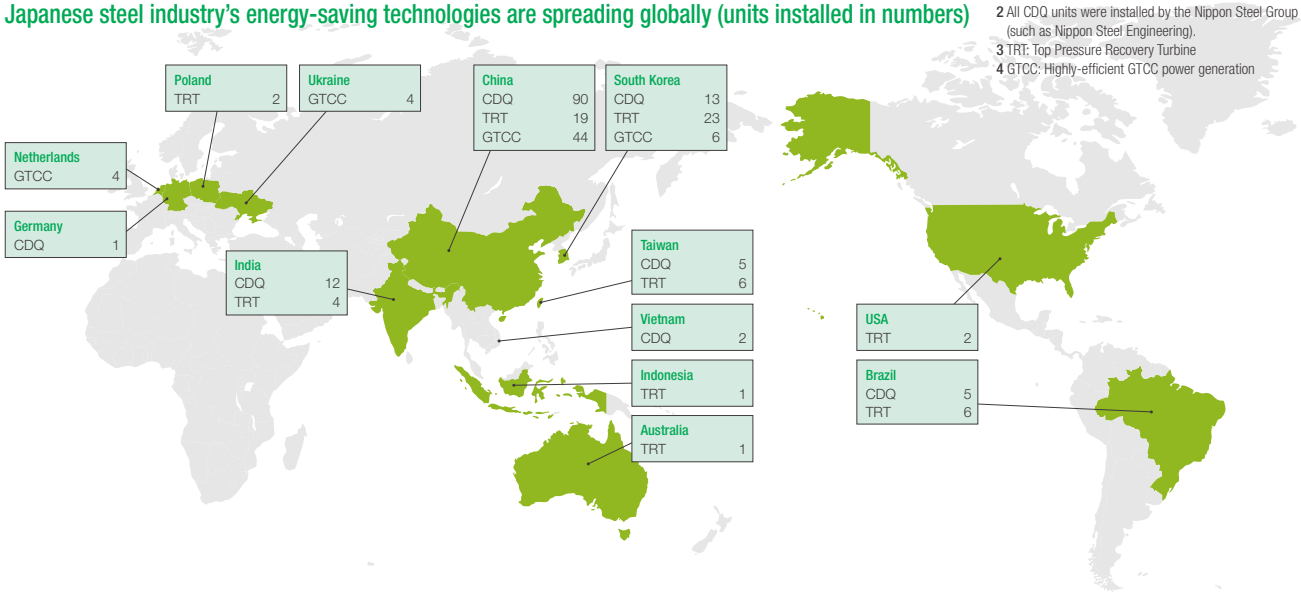
Japan's steel industry can contribute to reduction of CO_2 emission on a worldwide scale by transferring its advanced energy-saving technologies to emerging countries. The reduction effects of CO_2 emission by transfer of Japanese steelmakers' energy-saving technologies have amounted to 72.64 million ton reduction in CO_2 emissions per year in total.

(10,000 t-CO_2/year)

	Number of units	CO_2 emission reduction
Heat recovery	7	98
CDQ[2]	128	2,581
TRT[3]	64	1,129
Oxygen Converter Gas collection	22	821
Oxygen Converter Gas waste heat collection	8	90
GTCC[4]	58	2,545
Total	287	7,264

(FY2020)

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



2 All CDQ units were installed by the Nippon Steel Group (such as Nippon Steel Engineering).
3 TRT: Top Pressure Recovery Turbine
4 GTCC: Highly-efficient GTCC power generation

Promotion of Climate Change Measures

Efforts to address climate change in the field of resource recycling

1 Recycling of waste plastics

Using coke ovens at seven areas of Nippon Steel's five steelworks, about 200,000 tons of used plastic containers and packaging collected from general households nationwide are recycled 100%, in compliance with the Act for Promotion of Use of Recycled Resources. This contributes to reduction of about 600,000 tons of CO_2 a year.

In order to contribute to Japan's strategy to recycle plastic resources, we are developing technologies to expand waste plastic processing capacity of coke ovens, to densify waste plastic pellets as raw material, and to dechlorinate.

p. 36

2 Maximum use of steel scrap

Recycling of steel scrap is one of the key measures for achieving carbon neutrality.

We will significantly reduce CO_2 emissions in steelmaking process by maximizing the use of domestic steel scrap.

3 Blast furnace cement

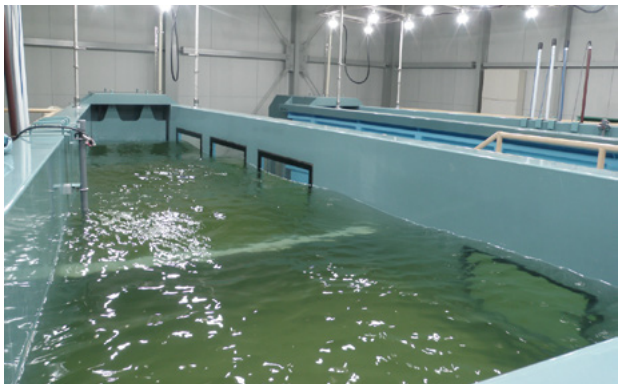
Blast furnace cement is made up of 45% blast furnace slag mixed with conventional cement, which reduces CO_2 emission by 40% (320 kg per ton of cement) compared to ordinary cement production.

p. 35

4 Blue carbon

Nippon Steel has promoted scientific analysis on usefulness and safety of use of steel slag — a by-product from the steelmaking process. To improve this technology, we began a basic study on blue carbon (CO_2 absorption and fixation in the marine ecosystem), which is getting more attention as a measure against climate change. We started to collect basic data on how much CO_2 can be fixated by using steel slag and creating shallow bottoms, tideland, and seaweed beds. Nippon Steel's approach is to use our own large water tank (sea laboratory), to develop methods for creating tidal flats, shallow bottoms, seaweed beds, etc. by utilizing steel slag, and improve the environment in coastal areas. We started by aggregating basic data in order to find out how much CO_2 can be fixated.

pp. 28, 43



Large water tank Sea Laboratory

Efforts to adapt to climate change

In addition to taking mitigation actions against climate change, we take into account the diverse impact of climate change and appropriately prepare for risks, as adaptive initiatives, and at the same time seek to capture business opportunities.

Preparation for risks

There is a risk that operations and shipments may be interrupted due to the flooding of steelworks and other events, including some caused by abnormal weather as a consequence of climate change. To prevent such risks, we are implementing measures against typhoons and heavy rains, measures to prevent crane overturn, installation of levees, reinforcement of embankments and gradients, and measures to prevent wind and flood damage at each steelworks.

Moreover, our steelworks have enhanced facilities to prevent water pollution. These facilities were provided to increase waste water treatment capacity and involved installation of 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 subjected to localized heavy rain.

In addition, some administration offices are built on a piloti structure, which means there is open space with no walls on the ground level. This makes the buildings less vulnerable to tsunami. This is a part of our efforts to be well prepared for emergencies such as flooding and high waves.

Capturing business opportunities

We have many products that are used for a long time as construction material for embankments and other public infrastructure. They contribute to providing solutions for "national resilience," such as protecting towns from flooding or high tides caused by heavy rains or typhoons. Adaptation to climate changes also leads to business opportunities for Nippon Steel.

For example, we have developed and provided for actual use various types of products and product utilization technologies in the civil engineering field. They include hat-type sheet piles (contributing to national resilience in a wide range of ways, including measures against liquefaction of river levees, water leakage, and tsunami reaching coastal levee), linear-type steel piles (having a high-tensile strength at the joints, being suitable to cell-type quays, erosion-control dams and water shut-off work, and contributing to measures for sand embankments and against landslide at the time of heavy rain or a typhoon), and a method of preventing subsidence by use of sheet piles.

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

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

[Mapping table of TCFD recommendations and their location page]

TCFD's recommendations and supporting recommended disclosures	Reference page
[Governance] Disclose the organization's governance related to climate-related risks and opportunities.	
• a) Describe the board's oversight of climate-related risks and opportunities.	p. 17
• b) Describe management's role in assessing and managing climate-related risks and opportunities.	p. 17
[Strategy] Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	
• a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	p. 33
• b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	p. 33
• c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	p. 33
[Risk Management] Disclose how the organization identifies, assesses, and manages climate-related risks.	
• a) Describe the organization's processes for identifying and assessing climate-related risks	p. 17
• b) Describe the organization's processes for managing climate-related risks.	p. 17
• c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	p. 17
[Metrics and Targets] Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	
• a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	p. 12
• b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	p. 20
• c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	p. 12

Scenario analysis

For each transition factor and physical factor, we have identified risks and opportunities that may have a significant impact on our business in the areas of upstream procurement, direct operations, and downstream demand for products and services. We have then considered strategies for each scenario.

In conducting the scenario analysis, we referred to the two scenarios (the below 2°C and 4°C warming scenarios[1]) of the International Energy Agency (IEA) and evaluated them over a medium- to long-term time period, up to 2050. In addition, the 1.5°C scenario (IEA NZE2050), which assumes progress in reducing and eliminating carbon emissions, was also adopted as a reference scenario in the analysis. At the same time, we have formulated a new climate change countermeasure vision with the aim of achieving "carbon neutral in 2050" consistent with the 1.5°C warming scenario, and have decided to tackle development of breakthrough technologies aimed at carbon neutral, as a challenge for the management.

1 The below 2°C warming scenario is a case wherein much-needed measures will be implemented to keep global average temperature increase below 2°C (1.75°C) compared to pre-Industrial Revolution times.
The 4°C warming scenario is a case that global average temperature will increase by 4 degrees, without taking any economic or additional measures against climate change.

Promotion of Climate Change Measures

TCFD scenario analysis

Scenario	Factors (risks and opportunities)	Events (expectations and concerns of stakeholders)	Impact to Nippon Steel (opportunities in ■, risks in ■)	Nippon Steel's strategy (including future responses)
Below 2°C	**Transition factor 1** Advance in electric vehicles (EVs)	World EV sales: 65 million units, 60% market share in 2030 (vs. 6.6 million units, 8.6% market share in 2021)[1]	**Opportunities in demand growth for our steel products** ■ Increase in the global total number of cars and resultant increase in steel demand despite a decline in the share of steel demand for cars equipped with internal combustion engines due to the growth of EVs' share of the new car market ■ Increase in demand for high-performance steel products — our area of strengths, such as electrical steel sheets for EVs	● Capture growing demand by strengthening the global supply of electrical steel sheets (see PICK UP on p. 34)
	Transition factor 2 Shift to other lightweight materials, prompted by tighter fuel efficiency regulations, etc. (multi materials)	Shift to other lightweight materials, prompted by tighter fuel efficiency regulations, etc.	**Opportunities in demand growth for high-strength steel and capturing of demand for other materials** ■ Some possibility of switching to other lightweight materials but little prospect for significant progress since steel excels in environmental evaluation from the LCA perspective, including the production stage and material recycling, and automakers increasingly emphasize the evaluation from the LCA perspective ■ Increase in demand for high-tensile steel, carbon fiber-reinforced plastic (CFRP), titanium, etc.	● Strive to further popularize the LCA concept through activities to raise customers' understanding and lobby the government for regulatory change ● Further increase the high-tensile strength of steel and provide the lightweight steel structure technology by proposing a comprehensive automotive solution (NSafe™-AutoConcept) (see PICK UP on p. 34) ● Capture demand for CFRP and other products in cooperation with Nippon Steel Chemical & Material Co.)
	Transition factor 3 Shift to low-carbon steel (steel that generates low CO_2 emissions in production)	Accelerating shift to low-carbon steel due to change in customers' demand	**Opportunities in demand growth for low-carbon steel** ■ Some shift to EAF steel with low CO_2 emissions in production ■ Continued increase in demand for BF steel due to insufficient increase in EAF steel to satisfy growing worldwide demand, caused by the limited supply of scrap	● Acquire the "EcoLeaf" environmental label for more products (see p. 10) ● Accelerate the Carbon Neutral Vision (breakthrough technology development, including high-grade steel production in large-sized EAFs and hydrogen steelmaking) (see pp. 21–26) ● Promote the use of direct reduced iron and other measures to reduce CO_2 emissions in existing processes
		Higher needs for decarbonization in steelmaking process	**Needs for a fundamental review of the steelmaking process aimed for decarbonization** ■ Potential to gain a great competitive advantage if our technological development and investments advance ahead of global peers ■ Increase in investment burden and operating cost for the introduction of new technologies	● Facilitate the development and implementation of innovative technologies by utilizing government support such as the Green Innovation Fund (see pp. 25–28) ● Consider sharing of cost by society (see p. 29)
	Transition factor 4 Higher needs for energy-efficient products and technology	Eco-friendly technology solution to boost demand	**Opportunities in demand growth for eco-friendly technology** ■ Increased demand for products that realize energy savings in the processing by customers ■ Increased demand for products that contribute to energy savings in use of end products ■ Increase in profits through the provision of the Group's technology solutions that enable energy saving in steelmaking process	● Expand supply of products that realize energy saving in customer processes, e.g. reduced-process steel bars and wires (see PICK UP on p. 34) ● Expand supply of products that contribute to energy savings in use of end products, e.g. high-tensile steel, and high-efficiency electrical steel sheets ● Government-private cooperation, technologies customized list, and steelworks diagnosis to provide energy-saving technologies to emerging countries (contribution to the global value chain), e.g. dissemination of CDQ, all of which are handled by Nippon Steel Engineering, into emerging countries (see p. 30)
	Transition factor 5 Higher needs for products and solutions associated with a society based on renewable energy and hydrogen	Ratio of renewable energy in world power generation: 88% in 2050 (vs. 28% in 2020) World production of hydrogen: 60EJ and 490 mn tons in 2050 (vs. 11EJ and 90 mn tons in 2020)[2]	**Opportunities in demand growth for products of our Group** ■ Profit growth by provision of the Group's products and solutions that support a renewable-energy-oriented society ■ Profit growth by provision of the Group's products and solutions that support a hydrogen-oriented society	● Enhance the Group's product menu for the renewable-energy society and expand sales in Japan and overseas, e.g. high corrosion-resistant steel sheets for solar power generation mount, steel plates and steel anchor chains for offshore wind power generation, and steel pipes for geothermal and biomass power generation ● Enhance the Group's product menu for the hydrogen society and expand sales in Japan and overseas, e.g. HYDEREXEL™ stainless steel for high-pressure hydrogen environments
	Transition factor 6 Increase in cost caused by adoption of carbon pricing	Increased cost due to adoption of carbon pricing	**Deprivation of funds for R&D, etc.** ■ Significant impact of carbon pricing, which is an additional burden and diverts funds for R&D	● Reduce CO_2 emissions through the expanded use of direct reduced iron, reduction in CO_2 emissions in existing processes, and advance in breakthrough technologies such as hydrogen steelmaking and production of high-grade steel using large EAFs (see pp. 23–26) ● Negotiate transfer to the price with customers
4°C	**Physical factor 1** Abnormal weather to suspend raw material suppliers' operation	Difficulty in procuring raw materials, caused by abnormal weather	**Limited impact by taking measures for risks** ■ Limited assumed risk in securing stable procurement of raw materials by taking the following measures: • Material sourcing from multiple regions in the world • Keeping raw material inventories in steelworks and ships	● Continue multiple sourcing ● Appropriately manage days of inventory and risks
	Physical factor 2 Abnormal weather to suspend operation and shipment	Difficulty in operation, caused by a natural disaster	**Limited impact by taking appropriate measures** ■ Adoption of BCP measures. Limited risks in production disruption caused by natural disaster. Excessively abnormal weather may result in suspension of operation, etc.	● Continually adapt measures in consideration of long-term trends Measures against typhoons and heavy rain, measures to prevent crane overturns, measures against earthquakes and tsunami (securing emergency evacuation places, embankment reinforcement, etc.)
	Physical factor 3 Heightened needs for solutions for "national resilience" against natural disasters	Natural disaster caused by abnormal weather	**Demand growth of steel for national land resilience** ■ Profit growth by providing products and solutions for national resilience against earthquakes, tsunamis, heavy rain, typhoons, etc.	● Enhance the Group's product menu and expand sales in Japan and overseas, e.g. steel-slit dams and NS ECO-PILE™ method

1 Source for EV-related data: the NZE 2050 Scenario of the IEA Global Electric Vehicle Outlook 2022
EVs include battery electric vehicles (BEVs) and plug-in hybrid vehicles (PHVs).
2 Source for data on renewable energy and hydrogen: the NZE 2050 Scenario of the IEA World Energy Outlook 2021

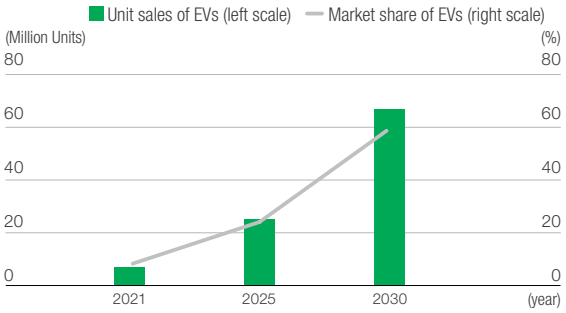
PICK UP Scenario Analysis

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

The social needs behind the drive for attaining carbon neutrality include increasing demand and the requirement for high performance (higher efficiency, smaller size, and lighter weight) for EV motors and the reduction of energy loss in motors and transformers to meet the tighter global regulations for high-efficiency transformers. The most rational means to meet such needs is the provision of high-grade electrical steel sheets, such as non-oriented (NO) electrical steel sheets used in motors and grain-oriented (GO) electrical steel sheets used in transformers.

In order to respond to growing demand for these electrical steel sheets and the requirements for higher-grade products, Nippon Steel has decided to invest a total of ¥123 billion to improve the capacity and quality of electrical steel sheets at the Kyushu Works Yawata Area and the Setouchi Works Hirohata Area. Our plan is to increase NO + GO electrical steel sheet capacity by 1.5 times, including an increase of 3.5 times for high-grade products, by the first half of fiscal 2024. We are also considering additional capacity measures to cope with the growing demand and the development of higher-grade products, in anticipation of accelerating progress in EVs and energy conversion toward achieving carbon neutrality.

World annual sales of EVs
(Net Zero Emissions by 2050 Scenario)



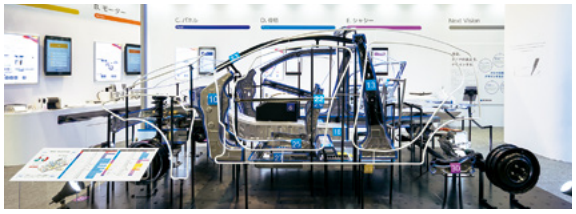
Prepared by Nippon Steel based on the IEA "Global Electric Vehicle Outlook 2022"

Transition factor 2 Response to meet the needs for lightweight materials (NSafe™-AutoConcept)

In response to the increasing demand for reduction of vehicle body weight and enhanced collision safety, we accelerated research and development, and started to make proposals not just on materials but also on the NSafe™-AutoConcept (NSAC), a comprehensive solution for the development of next-generation steel vehicles, in 2019. An extended version NSafe™-AutoConcept xEV has also been added to the lineup. We are working with our customers to develop advanced vehicles.

Reduction in vehicle body weight has long been desired by automakers but that need has been increasing in recent years, as it can contribute to reducing CO_2 emissions during vehicle production as well as driving. Concerning collision safety, the evaluation method has become diversified, and the advance in material strength and structural design are required more than ever before. Ultra-high-tensile steel sheets such as 1470 MPa high-tensile sheets and 2.0 GPa hot-rolled high-tensile materials for vehicle bodies, and 980 MPa high-strength steel plates for chassis can satisfy such needs. The application of the high-tensile steel products and the proposed structure and processing method have reduced the body weight of steel cars by 30%. This has made the steel car to have the similar weight to that of an all-aluminum car and to provide higher collision safety performance.

Material makers, including ourselves, used to focus on material development but the NSAC is contributing to the car making process in the areas of material development, structural and functional design, process development, and performance evaluation in addition to material development.

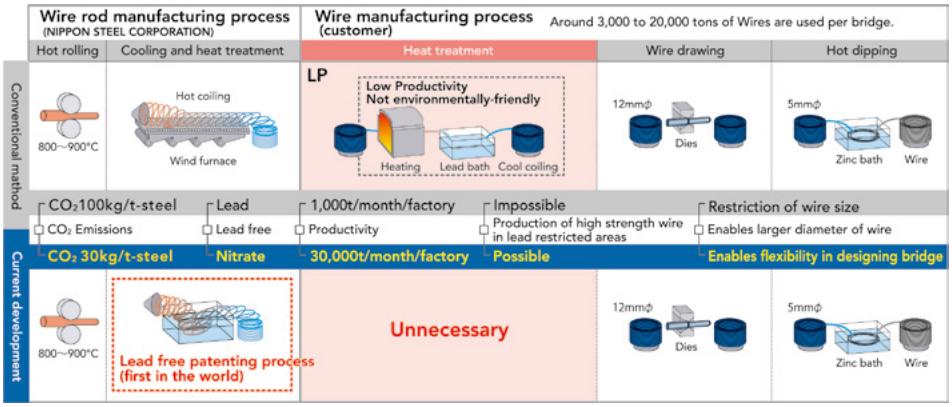


Transition factor 4 Response to increasing needs for energy-efficient products and technology (reduced-process steel bars and wires)

Reduced-process steel bars and wires are high-performance steel products that can eliminate a part of a variety of steel processing processes (heat treatment, wire drawing, finishing, etc.) at customers and reduce CO_2 emissions (GHG Protocol Scope 1).

In steel product manufacturing, the steel processing process aimed at producing quality requirements for end products and parts consumes a considerable amount of energy and emits CO_2. In order to solve this problem, we were able to draw certain steel properties through our own heat treatment, special control, and addition of trace elements in manufacturing process, which have enabled customers to omit certain heat treatment processes in their steel processing. The reduction of CO_2 emissions throughout the supply chain, including customers, has been achieved with this reduced-process steel bar.

This is a good example of how we respond to the needs of high-performance steel products, which contribute to the CO_2 emissions reduction in society as a whole, including the processing stage.



Contributing to Creation of a Circular Economy

1. Safety, environment, and disaster prevention

Steel is a flexible material that can be repeatedly recycled: 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. By utilizing this steelmaking process, we also 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.

Efficient use of resources and energy

We use industrial water and energy resources such as electricity and fuel in producing steel products, which are mainly made of iron ore mined overseas, coal used as a raw material for reducing iron ore, and iron scrap recycled by society.

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, 90% of water used in cooling and cleaning of products and manufacturing facilities are reprocessed and repeatedly used. These are examples of our efforts to make maximum use of limited resources and energy, without waste.

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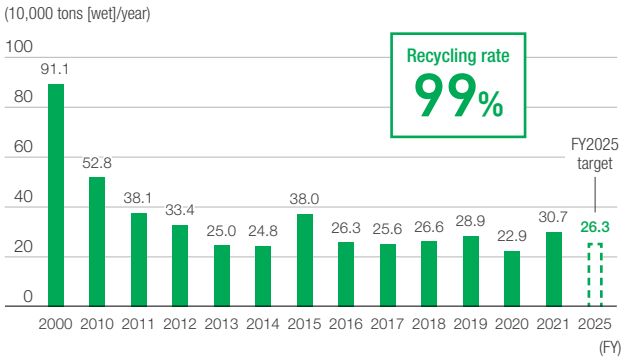
Promotion of in-house zero emissions

By-products generated and final disposal

In the iron and steel-making process, over 600 kg of by-products, such as steel slag, dust, sludge, and used refractory bricks, are generated for each ton of crude steel produced. In fiscal 2021, Nippon Steel produced 38.68 million tons of crude steel and generated 24.93 million tons of by-products. We are committed to recycling these by-products both in and outside the company, maintaining the high recycling rate of 99%. Although the final disposal amount has not reached our target (partly due to the effects of the structural measures), we will continue efforts toward achieving the fiscal 2025 target.

Nippon Steel's final disposal amounts



Effective use of steel slag

Almost all steel slag is effectively utilized. Approximately 70% of blast furnace slag is used for blast furnace cement, while steelmaking slag is used for materials for road base layers, civil engineering work, soil improvement, marine environment improvement, fertilizer, etc.

"Blast furnace cement," a mixture of pulverized blast furnace slag and ordinary Portland cement, contributes to a 40% reduction of CO_2 emissions during manufacturing, since the cement clinker burning process can be omitted. The blast furnace cement also excels in long-term strength and is registered as Eco Mark-certified product. The steel slag products help reduce natural crushed stone mining and have the energy saving impact during cement manufacturing. As a result, they are designated as a "designated procurement item" under the Act on Promoting Green Procurement, and have been certified as recycled products by some local governments.

Nippon Steel's pavement materials, KATAMA™ SP, are advantageously used in keeping with the characteristics of steel slag which hardens by reacting with water. They are used for forest roads and farm roads, as well as for weed preventive pavement to be installed near mega-solar panel installations and other locations.

Geo-Tizer™ made of steel slag can be mixed with soft soil (mud, such as surplus excavated soil from construction sites or farmland soil) to reform the soil to make it usable. Unlike conventional soil-improvement materials (i.e., cement and lime), this soil produces less dust, significantly reduces CO_2 emissions, and is less expensive, enabling reduction of construction cost. The remediated soil is outstanding in compacting and can also be easily excavated, as it does not excessively solidify.

Calcia modified soil — a mixture of steelmaking slag calcia modifier and dredged soil — has been used to improve the marine improvement, such as by backfilling deep-dug seabed areas and creating shallow bottoms and tideland. In addition, Nippon Steel's Vivary™ iron supply units, which are composed of steel slag and humus made from waste wood, provides iron needed for seaweeds to flourish, promoting regeneration of an area of the sea bed that had lost much of its living organisms.

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

Recycling of dust and sludge

To recycle the dust[1] and sludge[2] 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 East Nippon Works Kashima Area and a rotary hearth reduction furnace (RHF) at East Nippon Works Kimitsu Area, Setouchi Works Hirohata Area, and Hikari (NIPPON STEEL Stainless Steel Corporation). This enables us to recycle all internally-generated dust.

By-products and recycling (FY2021)

By-product	Amount generated (wet weight – million tons)	Recycling application	Recycling rate
Blast furnace slag	12.78	Blast furnace cement, fine aggregate, road base, etc.	100%
Steelmaking slag	5.65	Road base, civil engineering materials, fertilizer, etc.	99%
Dust	3.13	Raw materials for use in-house and also zinc refining	100%
Sludge	0.43	Raw materials for in-house use	88%
Coal ash	0.52	Cement raw materials, construction materials	100%
Waste furnace materials	0.35	Reuse, etc.	68%
Others	2.07	In-house use, others	100%
Total	24.93	Total recycling rate	99%

1 Fine dust collected with a dust collector
2 Semi-solid slurry recovered from industrial wastewater or sewage treatment

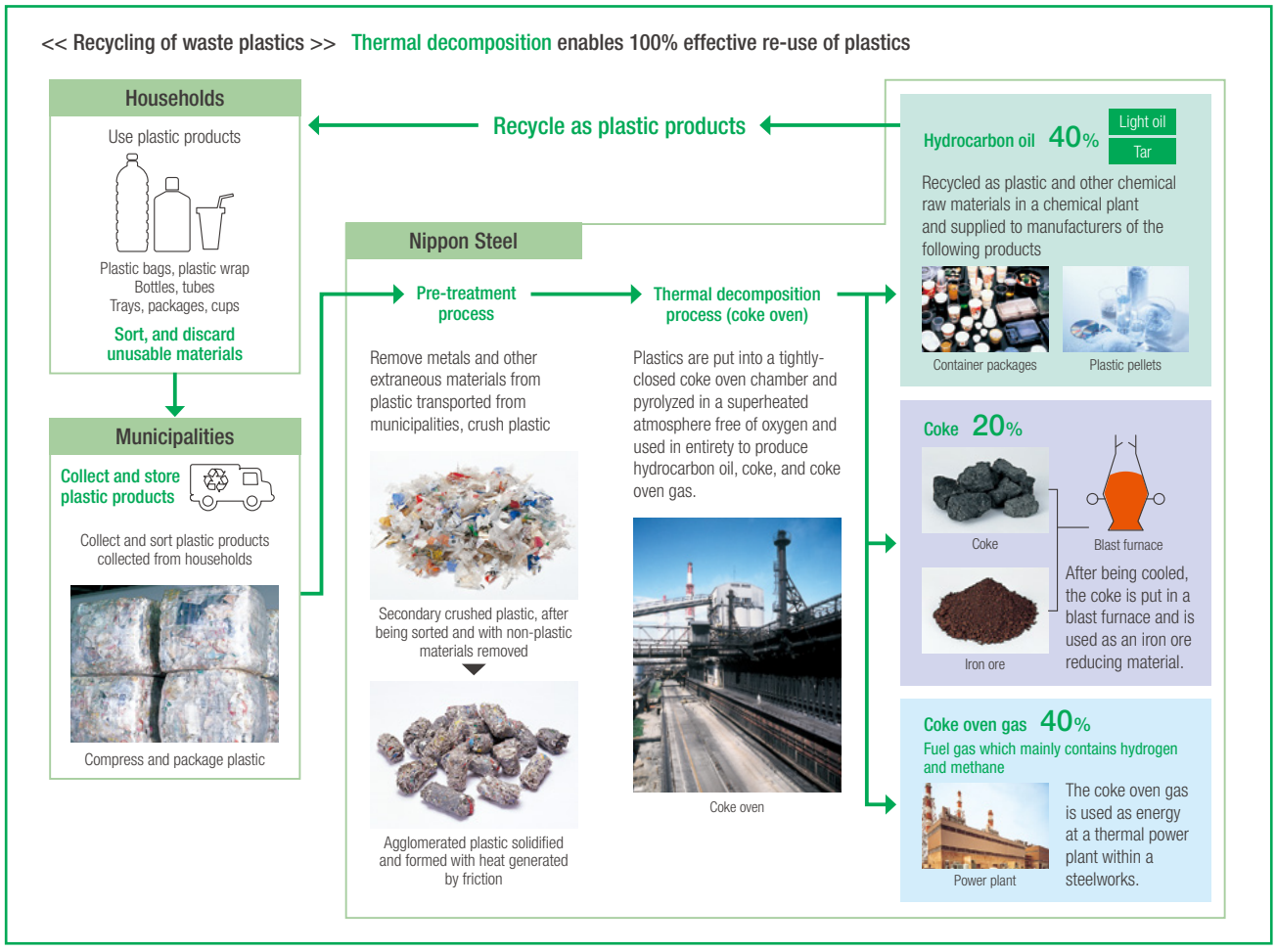
Increase in recycling of waste generated in society (waste plastics)

We recycle 100% of waste plastics collected from ordinary households through chemical recycling by using a coke oven in accordance with the Containers and Packaging Recycling Law of them. Specifically, waste plastics are used as hydrocarbon oil (40%), coke furnace gas (40%), and part of coke (20%). Currently, Nippon Steel is processing approximately 200,000 tons annually, or about 30% of the volume of waste plastics collected nationwide, in cooperation with local governments. Our method of using coke oven has an extremely high recycling efficiency and a great treatment capacity, contributing to a circular economy in many regions. The cumulative amount processed in fiscal 2000–2021 was approximately 3.71 million tons, equivalent to 11.87 million tons in terms of reduction in CO_2 emissions (the amount of annual CO_2 absorption[3] in artificial cedar forests in the area as big as 290,000 Yankee Stadiums).

Recently, chemical fibers and food trays have also been recycled by the same method. Furthermore, as the Plastic Resource Recycling Promotion Law enacted in fiscal 2022 calls for collection not only of container packaging plastics but also waste plastics in bulk collection, we are also working hard to develop technologies including increased treatment to meet these plastics processing needs.

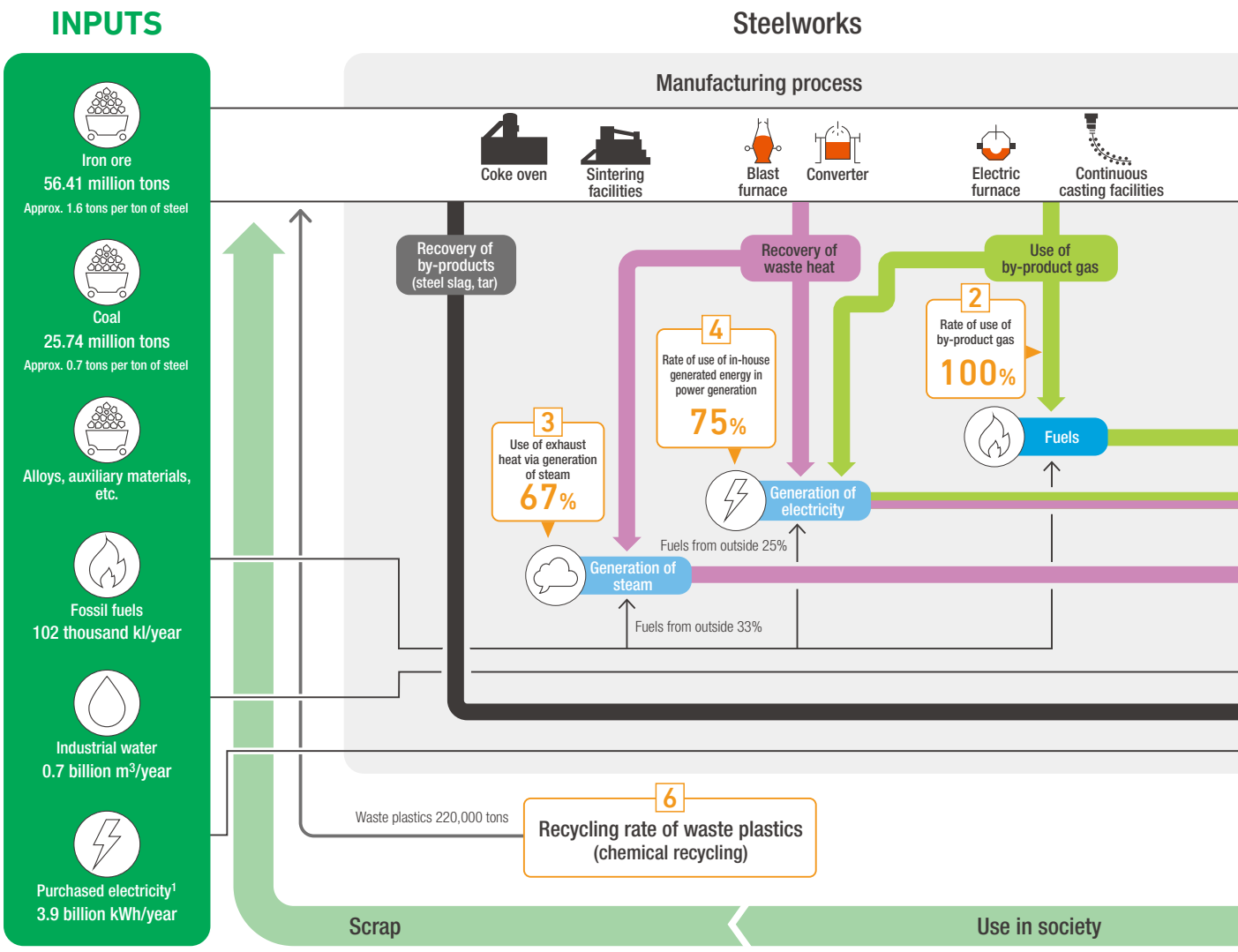
This expanded use of waste plastics has been incorporated in our "Carbon Neutral Vision 2050" measures to combat climate change, and is presented as one of the examples of the efforts of Nippon Keidanren (Japan Business Federation) member companies' activity in its "Recycling Economic Partnership."

3 One hectare of artificial cedar forest absorbs approximately 88 tons of CO_2 per year (source: the website of the Forestry Agency).



Contributing to Creation of a Circular Economy

Energy Material Balance



1 Purchased electricity (kWh) excludes electricity purchased from Cooperative Thermal Power Companies

Efficient use of resources

1 Water resources

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

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2 By-product gas

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

3 Use of exhaust heat

Exhaust heat, generated in the blast furnaces, sintering facilities, coke ovens, converters, and other facilities, is recovered and used in steam generation and power generation.

4 Electricity

Nippon Steel itself generates 89% of the electricity it uses at steelworks, 75% of which is from internally generated energy sources such as exhaust heat and by-product gases. In the future, we will also consider making more efficient facilities and switching fuel in order to further lower carbon generation.

5 By-products

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

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6 Recycling of waste plastics

Approximately 200,000 tons per year, or about 30% of plastic containers and packaging collected from households nationwide, are fully recycled by a chemical processing method using coke furnaces.

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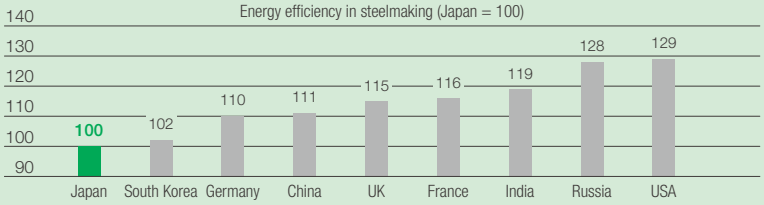
Efforts for efficient use of various resources have resulted in Japan's steel industry achieving the world-leading level in energy efficiency.

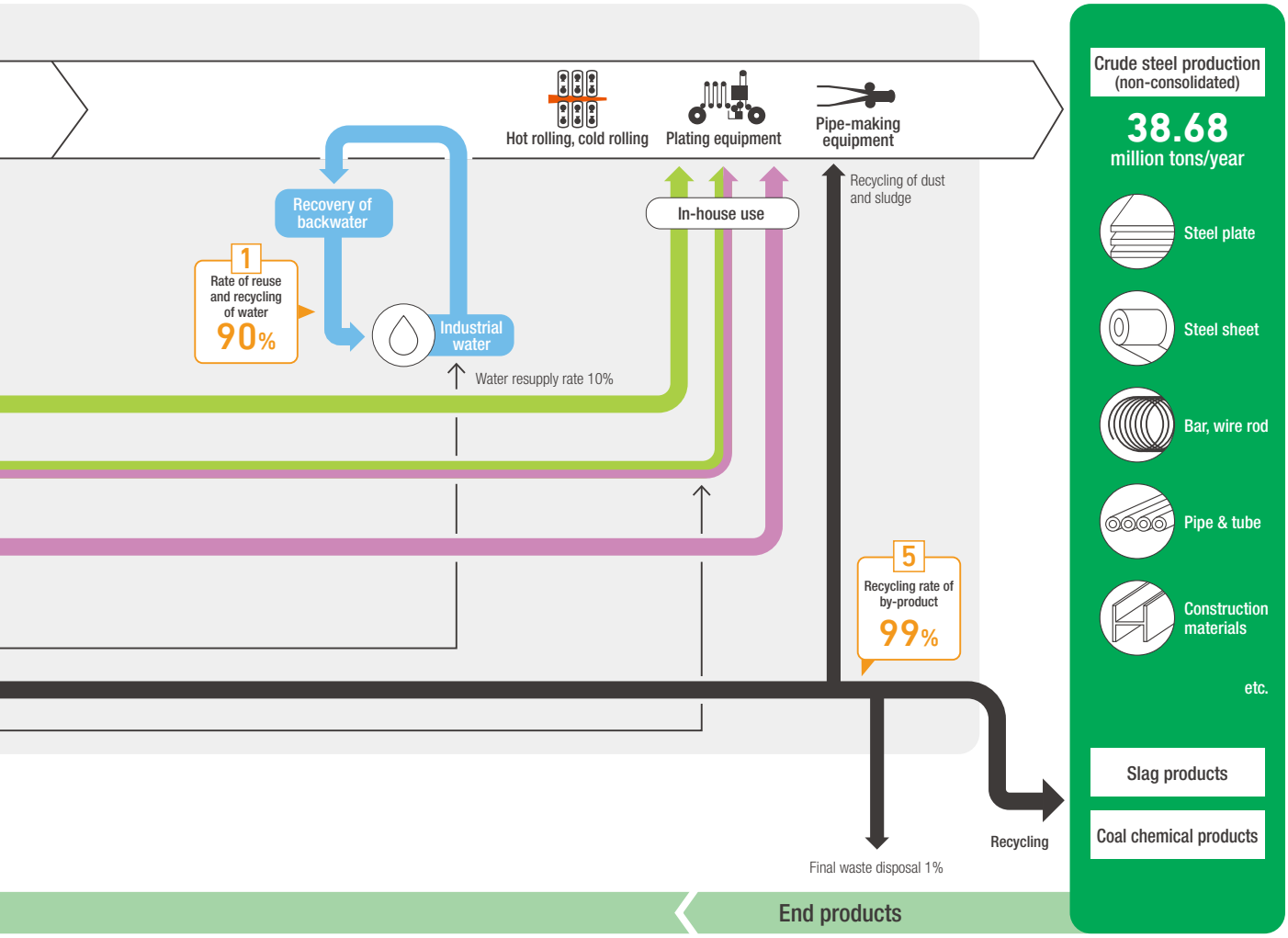
Energy efficiency in steelmaking by country (2019)



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

Numbers represent FY2021 performance

OUTPUTS

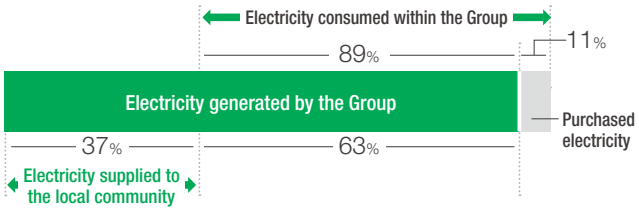


Coke Dry Quenching (CDQ) for large-scale waste heat recovery

The CDQ equipment quenches hot coke made in the coke oven with inert gas, and the heat is used to generate steam for power generation. Compared to the conventional wet quenching, 40% energy saving has been achieved.

CDQ

Nippon Steel Group's[2] Electricity Supply and Demand Balance (FY2021)



- The Group internally generates **89%** of the electricity it uses.
- The Group supplies **37%** of internally-generated electricity to the local community.

2 Including cooperative thermal power companies and affiliated electric arc furnaces

Promotion of Environmental Risk Management

1. Safety, environment, and disaster prevention

Nippon Steel is promoting management of environmental risk with the aim of continually enhancing preservation of the environment in various regions, with due consideration of environmental risks, which differ by each steelworks and factory, and with due consideration to compliance with Japan's Air Pollution Control Act and other regulations.

Atmospheric risk management

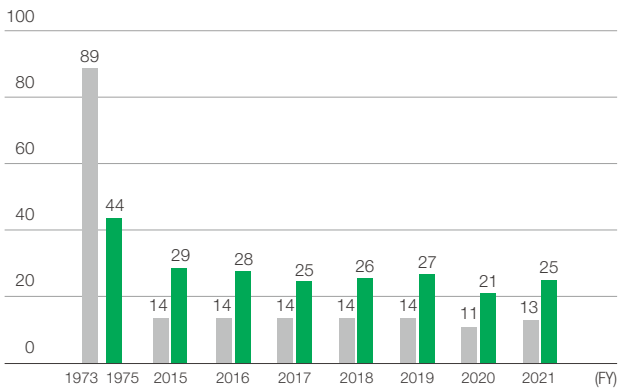
Atmospheric pollution prevention

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.

Prevention of scattering of raw materials and dust

To curb emissions of soot and dust generated from factories and raw material yards, we try to enhance their function by installing dust collectors and prevent scattering of particles by installing windscreens, windbreak trees and sprinklers, based on air pollution risk analysis through scientific simulation. We also conduct constant monitoring and regular patrols to ensure that no abnormal emissions are released.

Emission of SOx and NOx



Curbing mercury emissions

At our facilities mercury contained in waste gas is effectively captured by dust collectors or is absorbed by activated carbon. We have confirmed that all of our facilities including waste incinerators, which are regulated for mercury concentration, conform to the regulations. For sintering furnaces and electric arc furnaces for steelmaking, we voluntarily manage their mercury concentration in accordance with a voluntary management standard, issued by the Japan Iron and Steel Federation (JISF) in April 2018. We carried out voluntary measurement and confirmed conformity with the voluntary management standard at all facilities subject to the voluntary initiatives.

These results and evaluations are disclosed on the JISF's website in around September every year. Through such efforts, we strive to prevent mercury emission into the air.

Measures to prevent scattering of raw materials and dust, and air pollution in operational bases

Spraying of water and chemical in coal yards

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

Sprinkler trucks

Road cleaning trucks

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

Windbreak net at yards

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

Electric dust collectors

Dust collectors with bag filters

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

Wet type desulfurization equipment

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

Active coke dry type desulfurization equipment

The dry desulfurization and denitrification methods, using active coke, enables SOx and NOx in emission gas to be eliminated.

Low NOx regenerative burners

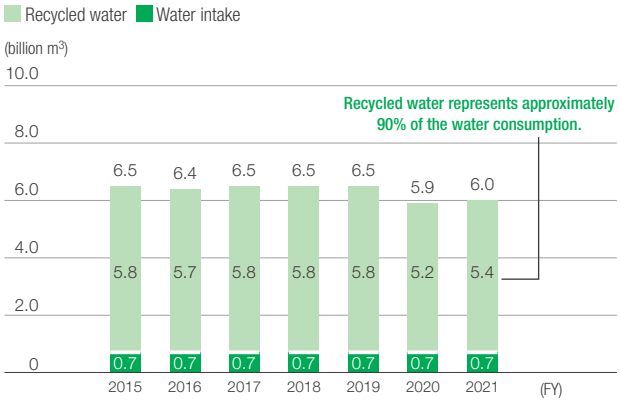
Burners featuring reduced levels of NOx generation and outstanding fuel savings have been installed.

Water environment preservation

Efforts to control the water intake and reduce wastewater discharge in steelworks

We use about 6.0 billion m^3 of industrial water a year, of which approximately 90% is derived from recycled or reused water to reduce wastewater discharge, at all of our steelworks and factories combined. We try not to waste precious water resources, and to control wastewater discharge. To achieve this, we make daily efforts to maintain and improve the performance of wastewater treatment equipment, and the inspection and control of wastewater quality. Our operational bases in Japan are evaluated by the World Resources Institute (WRI) Aqueduct to confirm that we are not prone to high-level water stress. Nevertheless, in preparation of the remote chance of a water intake restriction, some of our steelworks possess their own water reservoir. In certain circumstances, we contribute to easing water stress of the community by providing water for agricultural use or by cooperating in other ways.

Nippon Steel's water consumption (excluding power generation facilities)



Measures to reduce the risk of violating laws and regulations

In consideration of the importance of complying with the Water Pollution Control Law and conserving the water quality in the sea area to which it is discharged, we ensure that in the event of an operational problem the drainage outlets will not release abnormal wastewater outside the steelworks. Water drainage automatic monitoring systems, water shutoff gates, emergency reservoirs, etc. are installed to prevent water pollution.

We also strive to check, repair, and maintain equipment in order to prevent water pollution, and to train our personnel in methods of checking of operations and controlling work procedures. Moreover, our steelworks have taken measures, such as to install a large storage tank so that water tainted with iron ore powder would not directly be released into the sea even if our steelworks were struck by a local torrential rain caused by weather abnormality.

If there is a crack in an embankment facing the sea, there is a risk of a leakage of groundwater with unknown contaminants. In order to prevent this, the embankment is regularly inspected from the sea side enabling us to maintain and manage it in a sound condition. In areas with potential risk of leakage of water which may exceed permissible levels of contaminants, boards or a sheet water barrier may be installed so as to prevent leakage even if a crack develops on the embankment.

In fiscal 2022, the leaks of water that exceeded wastewater standards from the Kimitsu Area of the East Nippon Works occurred. We apologize for the concern and inconvenience this caused for the residents of the neighboring areas, authorities including the local government, and other related parties. Taking this incident very gravely, we are determined to make utmost efforts to investigate the cause and prevent any such problems from happening again.

Measures to purify water and prevent abnormal water discharge in operational bases

Waste water coagulating sedimentation treatment equipment

Fine undissolved matter is coagulated into bigger masses by chemical treatment, permitted to settle, and is removed.

Pressurized flotation system

Floating oil is removed by tiny bubbles formed by released air.

Activated sludge treatment equipment

Organic matter is decomposed and eliminated by bacteria.

Filtration equipment (secondary treatment)

Undissolved residues in the treated waste water are filtered by a sand layer and removed.

Waste water automatic monitoring equipment

The water quality of waste water is automatically monitored.

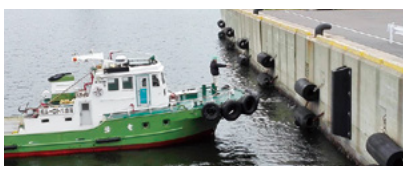
Waste water closing gate

Waste water flow is shut in case of trouble.

Rainwater effluent treatment facility

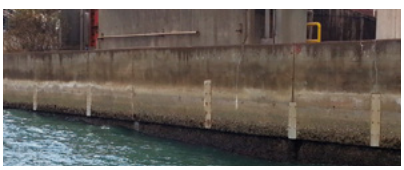
Undissolved residue from rainwater is coagulated and eliminated.

Checking of embankments



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

Repair of the damaged area of embankment



Damaged areas found by inspection are promptly repaired to maintain and manage the embankment in a sound condition.

Promotion of Environmental Risk Management

Soil risk management

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

Starting in fiscal 2018, the Revised Soil Contamination Countermeasures Act is being enforced in stages 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 Chemical Substance Management Law[1], Chemical Substance Evaluation and Regulation Law[2], and other laws concerning the management of chemical substances as well as the procedures employed. According to the targets of the Chemical Substance Management Law, we thoroughly manage the material balance, which includes the amount of chemical substances handled, the amount discharged to the environment, disposable amount, and the amount used as products. Similarly, we take care in managing the Volatile Organic Compounds (VOC[3]), which are said to cause photochemical oxidants and suspended particulate matter. In complying with the Chemical Substance Evaluation and Regulation Law, we identify and provide notification of the amounts of production and sales of the targeted chemical substances.

Nippon Steel also took the lead in promoting use of alternatives to using steelmaking materials and equipment that contain hazardous materials such as polychlorinated biphenyl (PCB) and mercury. According to safe handling standards, we systematically replace or dispose possibly hazardous parts and materials, given the time limit for disposal or the expiration date, stipulated for each area.

Management of discharge based on the Chemical Substance Management Law

In 1999, two years before the enforcement of the Chemical Substance Management Law, Nippon Steel began surveying chemical substances according to the voluntary control manual developed by the Japan Iron and Steel Federation (JISF). At present, in compliance with the Chemical Substance Management Law, we monitor 462 chemical substances and try to control their emission and improve the way we manage it. In fiscal 2021, there were 50 target substances for notification and the emission amount was 375 tons into the atmosphere and 25 tons to public water areas, while the disposal amount of mostly manganese, chrome, other metals, and their compounds to outside of the steelworks was 7,750 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 fiscal 2009, the 30% reduction target relative to fiscal 2000 was achieved. Since then, low discharge levels have been maintained.

Voluntary priority control of select chemical substances

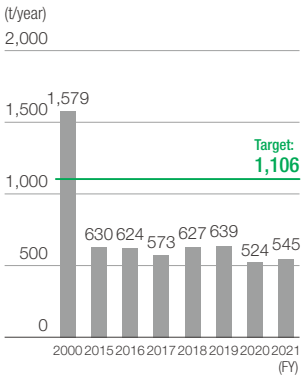
- **Dioxin**

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

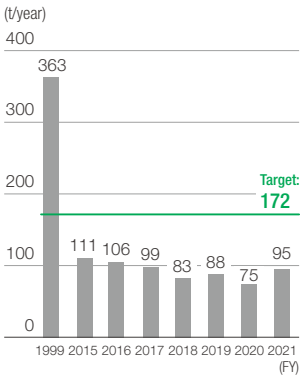
- **Benzene, tetrachloroethylene, dichloromethane**

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

Emission of VOC



Benzene



1 An abbreviation of the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (Law concerning Pollutant Release and Transfer Register/PRTR)
2 An abbreviation of the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.
3 Volatile organic compounds (VOC): Organic chemical compounds emitted into the atmosphere in the form of gases, which are considered to be the source of undesirable airborne particles and photochemical oxidants, which became subject to control under the Air Pollution Control Act of 2004, as amended.

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 on-site inspections at predetermined frequency, so as to continuously and appropriately ensure proper management.

COLUMN Environmental measures taken in steelworks

Prevention of dust scattering Installation of dust collectors

We are working to prevent dust from scattering, and dust collectors are installed at our plants. Based on risk analysis of the air environment, we have installed larger or additional dust collectors to improve the effect of scattering prevention.

As a recent example, a dust collector had already been installed in the sintering process at the Nagoya Works to collect dust generated in the cooling process of the sintered ore. In 2022, an additional dust collector was installed to prevent further dust dispersing.

As part of our zero emission efforts, dust collected by dust collectors is reused as a raw material for the sintering process.

A newly-installed dust collector at the Nagoya Works

Addressing to water risks Creation of a reservoir

In our business activities, we strive to reduce our environmental impact by continuously reducing water use and enhancing efficient usage.

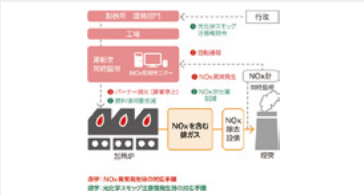
Although our operational bases are located all over Japan, the WRI Aqueduct evaluation confirmed that there are no steelworks located in areas categorized as High Risk or higher, and that there are no steelworks exposed to water stress.

In preparation for considering future facility needs, we are evaluating potential water stress. Water is indispensable for cooling products and equipment in the operation of steelworks. We are therefore working to secure water sources, such as making some steelworks possess their own reservoir so that to be prepared for the remote chance of a water intake restriction.

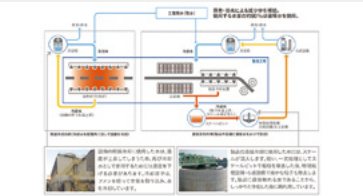
Sakurayama reservoir in the Setouchi Works Hirohata Area

Introducing other initiatives in the website
https://www.nipponsteel.com/en/csr/env/env_risk/

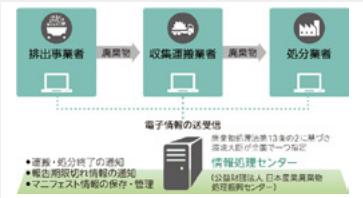
Atmospheric risks
Measures against risks of abnormal generation of NOx
Reduction in emissions of SOx and NOx, etc.



Water risks
Measures against risks of abnormal water discharge
Measures against local torrential rain and water leakage of embankments
Addressing water risks, etc.



Industrial waste
Electronic Manifest, etc.



Promotion of Environmental Relations Activities

Initiatives on Conservation of Biodiversity

The Declaration of Biodiversity by Keidanren

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

Policy for the initiatives

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

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

1 Creation of Hometown Forests

Reproducing "the grove of a village shrine" and nurture biodiversity

We have carried out the "Creation of Hometown Forests" projects at our steelworks and factories in Japan under the guidance of the late Dr. Akira Miyawaki (professor emeritus of Yokohama National University), with the aim of facilitating harmonious coexistence between nature and humans. This project comprises research on the natural vegetation inherent to a certain area in a nearby grove associated with a historical shrine (*Chinju-no-mori*), careful selection of suitable trees, growth of their saplings in pots, and planting them in designated places by local residents and our employees.

This was the first project by a private company in Japan to create a forest that harmonizes with the local scene and is based on an ecological approach. This is one way we try to raise the awareness of our employees regarding the environment. At present, our forests in aggregate have grown to total around 840 ha (about the size of 180 Yankee Stadiums).

Wild birds and animals visit the forests we make and maintain at our steel works sites across Japan. Wild birds and animals inherent to the land return to the forests. Thus, the "Creation of Hometown Forests" helps conserve biodiversity, and sequester CO_2.

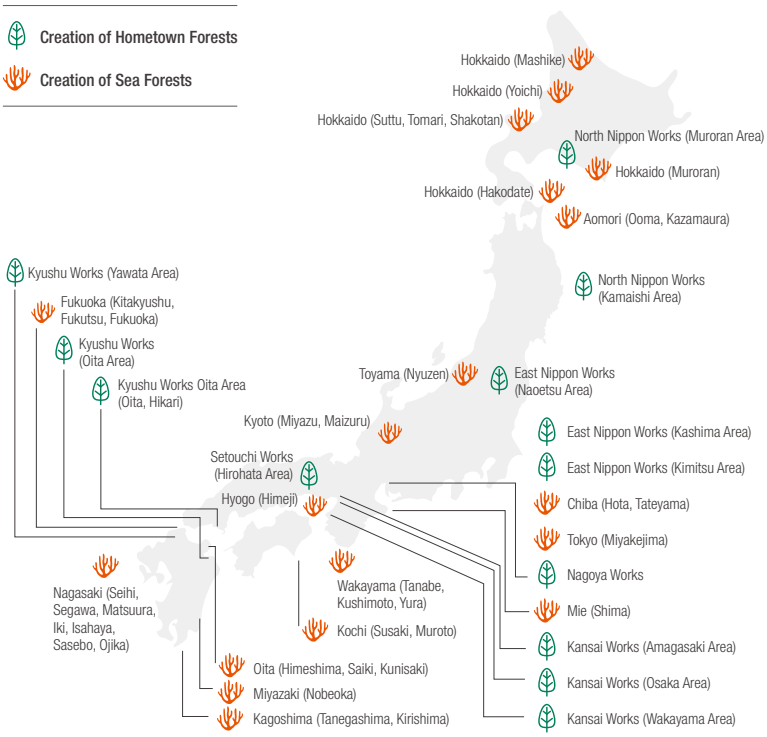
2 Creation of Sea Forests

Implemented in 38 spots in Japan to improve sea desertification

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

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

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



Some animal inhabitants of the Hometown Forests

Muroran	Ezo deer, Ezo red fox, Ezo squirrel, eagle, buzzard, magpie
Kamaishi	Moon bear, Japanese serow, deer, hare, black-tailed gull
Naoetsu	Japanese dace, carp
Kashima	Pheasant, shrike, duck
Kimitsu	Bulbul, pheasant, little tern, swallow, egret
Nagoya	Raccoon, pheasant, bulbul, shrike, swallow, great tit
Osaka	Weasel, starling, bulbul
Wakayama	Raccoon, marten, bulbul, tiger keelbuck
Sakai	Duck
Amagasaki	Heron, bulbul, lizard, killifish, white-tailed skimmer
Hirohata	Buzzard, shrike, oriental turtle dove, bulbul, starling, bunting
Yawata	Weasel, pheasant, gray heron, Japanese cormorant
Kokura	Gull, Japanese wagtail, graphium sarpedon
Oita	Whooper swan, kingfisher, killifish, mayfly, firefly
Hikari	51 species of birds including black-tailed gull and herring gull


Gray heron

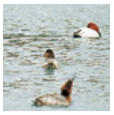

Buzzard


Japanese dace


Bulbul


White-tailed skimmer


Little tern


Duck


Raccoon

3 Participation in community projects

Participation in ecological preservation activities in the community

Since 2012, the Nagoya Works of Nippon Steel has participated in the Inochi-wo-Tsunagu (Life Sustaining) Project, which has participation by a local students' planning committee, representatives of 11 companies, the Eco-Asset Consortium and the Japan Ecologist Association of Support (NPO). This project seeks to develop an ecosystem network to link green areas at each company site and vicinity. To thereby increase the potential of the linked areas, an animal path 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. The project received the Minister of the Environment Award at the 2021 Sustainable Social Development Award as this activity's creation of a network that transcends student and corporate boundaries, which led to a wide range of cooperative activities, were highly evaluated.

4 Contribution by use of by-products

Steel slag being used for rice cultivation

Steel slag, a by-product of steelmaking, contains nutritional matter that helps grow plants. It is therefore used as a fertilizer for rice cultivation, dry-field farming, and pasture grass. Silica contained in steel slag promotes photosynthesis by keeping leaves upright and improving their light receiving orientation, while iron is effective in preventing root rot and leaf blight. The steel slag also contains phosphoric acid, manganese, boron, and various other components of fertilizer. Nippon Steel donated converter slag fertilizers to cooperate for research by Tokyo University of Agriculture for salt removal in farmland in the Soma area of Fukushima Prefecture, which was devasted 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.

Respect for Human Rights

4. Human resources, and diversity & inclusion

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

Basic policy

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 as unjust the discriminatory treatment of workers based on nationality, race, belief, creed, gender, age, sexual orientation, and disability. In addition, we give careful consideration to the traditions and culture, business practice, and labor practice of each country or region as we accelerate overseas business development.

Based on these basic ideas concerning respect for human rights, we strive to create a workplace environment where employees can share diverse values and maximize their abilities. We thereby seek to improve productivity, work conditions, benefits, and the working environment, with the aim to enrich the life of employees and achieve the corporate development.

Efforts to prevent human rights abuses

Addressing human rights risks

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

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

Along with the group-wide expansion of our efforts to Group companies in Japan and overseas, monitoring surveys on the status of compliance with labor-related laws and regulations, the establishment of consultation contacts, and other issues are regularly conducted via a checklist on internal controls.

Through these efforts, we are continuously and systematically promoting activities to prevent human rights abuses. This includes the understanding of human rights risks that change with the times and the development of a system and a strategy to reduce the risks.

Prevention of forced or child labor

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

Compliance concerning salaries

In compliance with laws and regulation concerning salary and wages payment, Nippon Steel has set up 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, hold meetings with labor representatives, and appropriately reward employees by paying performance-based bonuses linked to company profits.

Human rights awareness education

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

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

In addition to general education that contributes to the prevention of human rights abuses in workplaces, we also address specific human rights abuse risks in formulating and oversight of specific work assignments. Examples include education on fair recruitment selection by employees assigned to the tasks of hiring in order to prevent job discrimination, and education on cross-cultural understanding and communication for those assigned to overseas business in the context of preventing human rights abuses (i.e., consideration for each country's unique traditions, culture, business practices, and labor-management practices).

The number of recipients of training courses by rank on human rights (FY2021 results)	5,590

Mechanism of corrective actions

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

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

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

Communicating with stakeholders

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

Labor-management discussions (FY2021)	95 times for the entire Company 942 times at steelworks and offices
Number of union members and unionized rate (March 31, 2022)	26,429 (100% unionized)

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

Diversity & Inclusion

4. Human resources, and diversity & inclusion

Through our efforts in promotion of diversity and inclusion, we are committed to creating a company where diverse employees are empowered, and feel proud and fulfilled.

Basic policy

From the perspective of creating a company where diverse employees are productive, perform at their best, be empowered, and feel proud and fulfilled, we are reinforcing our diversity & inclusion efforts with a focus on the following five areas, as one of important management issues.

1. **Promote female employee's participation and career advancement**
2. **Realize work life balance so as to enable employees with various backgrounds and circumstances to perform at their best**
3. **Develop health management in order for employees to perform at their best until the retirement age of 65**
4. **Prevent harassment**
5. **Promote empowerment of the elderly and the disabled**

The Diversity & Inclusion Department has been established as a dedicated unit to promote these efforts.

Status of employees (non-consolidated basis)

	Men	Women	Total
Number of employees (March 31, 2022)	25,810	2,898	28,708
Number of new hires (April 2022)	487	73	560
Average years of service (March 31, 2022)	17.0	12.0	16.5
Average age (March 31, 2022)	39.0	33.9	38.5
Turnover rate (FY2021)[1]	2.7%	4.6%	2.9%

1 The rate of voluntary retirees to all employees

Promotion of women's participation and career advancement

What we have done so far

We have endeavored to establish a comfortable working environment for female employees. Specific programs include: 1) a childcare leave benefit which is more generous than legally required; 2) a program for employees who rejoin the company after having left it because of childcare or nursing care and other reasons; 3) a leave option to assist overseas relocation of a spouse; and 4) a temporary exemption program for employees who have difficulty in relocation because of childcare or nursing care and other reasons. We have also been opening 24-hour childcare centers in steelworks and provide maternity work clothes for use by steelwork employees who are in the childbirth/childcare phase, in order to help them continue their shift work with confidence. We are also working to improve the workplace infrastructure such as showers, toilets, and dressing rooms at manufacturing sites, and to improve the work content.

In-house childcare center
(East Nippon Works Kashima Area)

Number of in-house childcare centers (April, 2022)	7 centers
Number of users of in-house childcare centers (April, 2022)	151

Toward further promoting women's participation in the workplace

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

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

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

1 Plan period: 5 years (April 1, 2021–March 31, 2026)

2 Goals, details of efforts, and implementation schedule

Target 1 **Aim to at least double and possibly triple the number of female employees in management positions in 2025 from 36 in 2020, and to increase by at least four times and possibly seven times by 2030.**

From FY2021

- Hire more women.
- Confirm the individual circumstances and intentions of female employees, and consider placement and development measures based on their circumstances in order to enable them to continue to work and actively perform.
- Invest in the working environment so as to expand the placement of women, mainly at steelworks (improvement in work infrastructure, work content, etc.)
- Consider and implement work support measures for employees in the childcare status period, such as measures for childcare centers that offer night-time service.
- In light of the enhancement of the programs related to childbirth and childcare, prepare a brochure to introduce the relevant programs, distribute it to employees, and revise related programs as needed.
- Provide career education that will contribute to the further promotion of female employees' performance.
- Provide education on diversity to executives who supervise female employees.

Target 2 **Aim at 75% or higher utilization rate of paid leave days.**

From FY2021

- Prepare a pamphlet on the vacation and leave program, distribute it to employees, and develop educational activities.
- Encourage taking paid leave days by setting with the labor union some specific days recommended for paid leaves and by conducting a campaign to do so in the summer.
- Managers to take the initiative in taking off on paid leave days.
- Managers to support each employee to take paid leaves as scheduled.

Number of female employees in management positions (April 2022)	55
Utilization rate of paid leave days (FY2021)	77.8%

Improved hiring and retention

The ratio of women in overall hiring is 15%, and we will continue to expand their hiring. We are encouraging remote working to facilitate a shift to a flexible workstyle and to reduce long work hours so that those with a constraint on the workplace or work time due to childcare or other conditions can continue to work. In addition, career assessments for female employees have been conducted to facilitate flexible placement and development based on the understanding of individual circumstances and to improve retention rates.

At the same time, we will continue to make changes to enhance the working environment, including improvement of the environment for expanding work placement for women especially in steel mills, and the operation of childcare centers that can also be used during the night time.

The ratio of women in overall hiring (Average ratio for FY2020–FY2022)	Office staff and engineers 25% Operators and maintenance personnel 10% Overall hiring 15%

Support for employees' career development and work-life balance

We facilitate the development of female employees by providing them with opportunities for growth through proactive efforts in anticipation of their various life events, and by actively promoting their advancement to managerial positions. As a development policy for the appointment of employees to managerial positions, we have established new respective career training programs for young and middle-class employees since fiscal 2022. We encourage employees to interact, and not to shy away from challenges arising from their work experience and life events; we also make them acquire mindset skills for better mutual understanding with the company and self-realization.

We will create a workplace culture where work and home life are comfortably balanced by making various programs well known to employees, through improvement and dissemination of brochures which explain the programs. We also provide to managers training concerning unconscious bias and diversity management.

With the aim of encouraging male employees with young children to actively participate in childcare, since the second half of fiscal 2021 we have been encouraging them to take childcare and related leave.

Utilization of childcare support program (FY2021)

Number of childcare leave users and acquisition rate	267 men (25.6%)[2] 119 women (100%)
Return ratio of female employees after childcare leave	98.8%
Number of users of the short-work hour program for childcare	111

2 Results for the 2H of FY2021: 42.3%

Realizing the work life balance as a means to enable people with diverse situations perform well in the workplace

Restraint on long-work hours

As a precondition for an environment in which diverse human resources can perform at their best, we are committed to reducing long work hours based on appropriate work time management. Prior to the revision of the Labor Standards Act, starting in fiscal 2018, we set up work time capping rules for all employees, including managers, to promote improved work management and work practices that lead to more efficient, higher-value-added output. In addition, we had set a goal of less than 2,000 hours on average for the total annual actual working hours, and have achieved it in fiscal 2021.

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

Enabling flexible ways of working

All human resources with their diverse attributes and circumstances, such as age, gender, and restrictions on work time and workplace due to childcare and nursing care, ideally should make the most of their finite time available and perform at their best. From this viewpoint, we are expanding our work system to move away from traditionally-set ways of working and pursue more flexible and diverse ways of working in accordance with the nature of work at any given time and fluctuation in workload flow of operations needed at that time, and the circumstances of each individual. Specifically, we are actively utilizing the telework system and expanding workplaces that use the "coreless flexible system," which eliminated the core time — an essential time period to be in the office. Based on these systems, we aim to achieve improved productivity and employees' work-life balance, while pursuing ways in which individuals can perform at their best.

Realization of a flexible way to take time off from work

We have been establishing the environment for our employees so that it facilitates a flexibility in the ways to take time off from work, tailored to the circumstances of individual employees and their life stage.

Annual paid holidays can be taken on a half-day basis to meet employees' needs. The head office, for example, sets every Friday in August as an "Eco-paid leave day," and recommends making it easier for employees there not needing to attend meetings and other events on those days to take off.

Concerning childcare leave, in addition to providing a longer period than the statutory limit, the expired annual leave days accrued by each individual can be recovered to paid off-days for parental leave. Currently, we are focusing on clarifying the corporate policies, fostering a workplace culture that encourages employees' use of the system, and promoting the use of parental leave and childcare-related leave benefits by all male employees who are entitled to childcare leave so that they can get actively involved in childcare.

Matched to the ongoing aging of Japanese society, programs for nursing care leave and time off for nursing care have been established to help employees continue working while attending to nursing care. The expired leave days that have been accrued can be used for nursing care purposes, as part of our efforts to provide an environment in which employees can work with peace of mind while providing care.

The expired annual leave days can also be utilized for childcare and nursing care as well as sick leave, care of elementary school children, volunteer work, and infertility treatment. From this year, it can also be utilized for prenatal checkups and recurrent education. For the latter, we have established a leave system for obtaining a degree at a university or another educational institution.

To promote the use of these programs, we distributed a brochure that summarizes each type of work and vacation program applicable for each life stage. We try to make the programs better known through various training programs.

Performance of ways of working and taking time off (FY2021)

Average overtime hours per worker per month	18.9 hours
Utilization of paid leave days	77.8%
Average paid leaves taken	15.6 days
Childcare leave users and utilization rates	267 men (25.6%)[1] 119 women (100%)
Nursing care leave users (including continued users)	9
Users of the short-work hour system for nursing care	1

1 Results for the 2H of FY2021: 42.3%

Benefit programs

In order to support the various life stages of employees and enable them to achieve a good work-life balance, we are also focusing on welfare measures. We support employees' personal life with various programs: provision of housing, including dormitories and company housing, and a cafeteria plan (work-life support program).

Health management aimed for employees to work at their best up to the age of 65

Basic policy

We aim at ensuring that all employee work at their best from the time of joining the company to retirement, which has been extended to the age of 65. To accomplish this, we assist them to maintain and enhance both mental and physical health. We conduct health promotion measures focusing on disease prevention as well as early detection and treatment. We are committed to providing advanced health checkups including cancer or mental disorder screening and encouraging employees to get regular checkups, and provide consultation or counseling about lifestyle or stress coping by health care professionals, as needed. Employees are expected to also be committed to implementing measures for their own health maintenance, such as getting various checkups and improve their daily lifestyle. We believe that such efforts by both the Nippon Steel Group and its employees become a source of motivation for work. They are encouraged to balance their work and health and they try not to get sick and, in case they get sick, they continue working while undergoing treatment.

Nippon Steel Corporation Group Code of Conduct

5 Create a healthy, safe and comfortable work environment, and respect the character and diversity of our employees.

Nippon Steel's Basic Policy on Safety and Health

Basic Philosophy

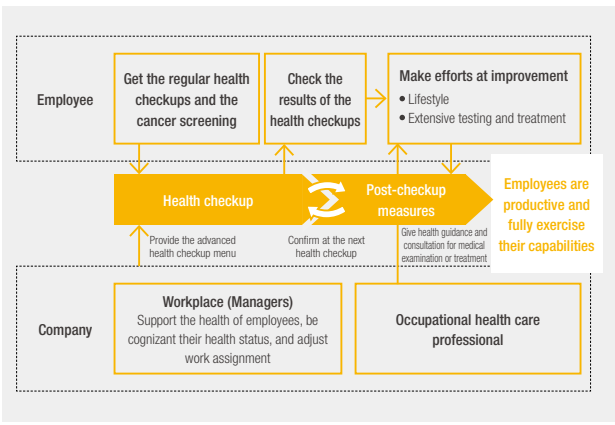
1. Ensuring and maintaining the safety and health of employees of the Nippon Steel Group is the Group's most important, top-priority values and the basis that supports business development.
2. Under the Management Principles of "developing and bringing out the best in our people," the Nippon Steel Group makes continuous efforts to abide by this philosophy and continues to contribute to society through their safety and health.

Specific Guidelines

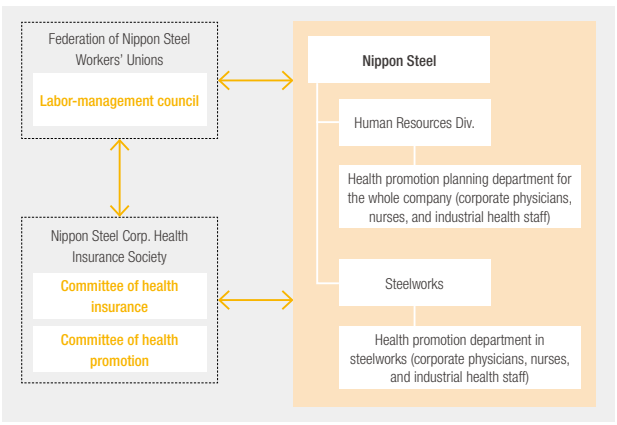
1. We observe applicable laws and regulations, and give top priority in all business decisions to ensuring safety and health.
2. We maintain awareness and understanding of actual workplace conditions, provide the guidance needed to ensure safety and health, and remove factors that might lead to accidents.
3. We follow plans to implement measures to realize safer, healthier work procedures and work environments.
4. We ensure the observance of rules and engage in hazard prediction, and proactively implement workplace activities to enhance the level of safety and health.
5. We provide the education and training needed to ensure the safety and health of people working in the Nippon Steel Group.
6. We continuously develop and improve safety and health efforts through the safety and health management system.

April 1, 2019
Eiji Hashimoto
President of Nippon Steel Corporation

Commitment to the health of both the Company and its employees



Organization for health promotion



Promoting physical wellness

Cancer disease control

Various cancer screening (including non-statutory exams) based on age and gender are incorporated in our health checkups.

In particular, regarding exams for gastric and colon cancer, which are high risk diseases, we set the evidence-based priority target age and screening frequency for the examination. We also set our target rate of exam-taking and encourage employees to take exams for early detection and treatment of cancer.

Type of examination	Priority target (target age and test frequency)
Gastric cancer examination (gastric fluoroscopy)	Once every 2 years, 50-years old or older
Colorectal cancer test (fecal occult blood)	Once a year, 40-years old or older
Prostate cancer test (PSA)	Once every 3 years, 50-years old or older
Breast cancer screening (mammography)	Once every 2 years, 40-years old or older
Cervical carcinoma of the uterus (uterine cytology)	Once every 2 years, 20-years old or older
Gastric cancer risk test (pylori)	When joined the company and at 40
Liver cancer risk test (hepatitis virus)	When joined the company and at 40

Actual rates of taking cancer examination (2021)

Gastric cancer screening	68.4%	Target	70% (2025)
Colorectal cancer screening	73.1%	Target	90% (2025)

Cerebral cardiovascular disease control

We have established a unique company-wide system that enables us to assess and manage the risk of diseases based on the results of health checkups. We provide health guidance according to risk factors or control the frequency of health checkups.

It is important that workers with high risk of cardiovascular disease improve their lifestyle. We will improve the implementation rate of specified health guidance, which aimed at improving the dietary and exercise habits of workers, by setting a target rate and promoting medical visits. We cooperate with the Health Insurance Union for achieving the goal.

Specified Health Guidance (2020)

Actual implementation rate 47.6%	Target	Target implementation rate 70% (2025)

Promoting mental wellness

Aiming for each employee in the Nippon Steel Group to enjoy a vigorous life on and off the job, we provide a consulting service for prevention and early detection in the area of mental health. For general employees, we have incorporated the issue of mental health in various in-house seminars and offer education on how to be aware of one's own stress and to deal with it. For managers, we offer education on how to care for their subordinates and manage their teams, and how to coordinate with the corporate health care professionals (occupational physicians, health nurses, and other staff). Moreover, we provide stress checks through a workplace stress survey every fall. Occupational health care professionals give guidance for improvement by teams and individuals based on the result of the stress check. In contributing to a vigorous work environment, managers implement necessary measures according to the issues of a team or an individual, coordinating with the personnel department and the health department. Because early detection and early response are important in the treatment of mental illness, we identify those who are at risk at the Health Consulting Contact by various measures in association with the Company's mental health e-learning and questionnaire event conducted every June. Occupational health care professionals swiftly respond to the findings of the events to foster mental wellbeing.

Our mental health initiatives

Classification	Details
Proactive action (Self-care) (Care by management supervisors) (Care by occupational health care professionals)	● Stress check for awareness of their stress Training for new hires and young employees ● Workplace analysis of stress check to help employees become aware of their stress ● Support from supervisors or colleagues ● Training for managers ● Providing mental health education program by occupational health care professionals
Early detection	● Screening of those in poor conditions in the interview during a regular health checkup ● Screening of highly-stressed people via stress checkups ● e-learning to extract those who wish to be consulted ● Establishment of a health counseling contact
Support for employees' return to jobs and prevention of recurrence	● Support for employees' return to jobs based on the return-to-work program ● Re-designing of work assignments for a smooth return to the workplace ● Regular interviews after return by occupational health care professionals

Support to employees who work overseas

To enable employees who have been assigned to work overseas to be free of undue worries, a seminar for the employees and their family is held before the overseas assignment, and information on mandatory vaccination, the local medical system, and other matters are provided. Under the policy of providing continuous health management support during overseas assignments, interviews with occupational health care professionals are regularly conducted counseling via online and at the time of a temporary return to Japan, in addition to aftercare checkups of the regular medical exams. Moreover, one of the Company's physicians periodically visits overseas offices, researches local medical institutions and the daily-life environment, and meets with the employees who work overseas to offer advice. We have contracted with a medical service company to provide the medical care locally, in preparation for the employees possibly becoming ill overseas.

Concerning the COVID-19 infections, necessary infection prevention measures, including evacuation measures, have been implemented in consideration of the local infection situation and the state of medical care, with the first priority on the safety and health of the employees who work overseas and their families.

Health-wellbeing activities

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

Classification	Details
Health Challenge Campaign	● A company-wide measure in which employees challenge for two months to improve their own life habits ● Provide courses that are effective in improving health checkup results and lifestyle. Ex. Take 8,000 steps a day/Have good breakfast
Health e-learning	● Twice a year for all employees ● The themes for FY2021: "Mental health e-learning: Mental signal and recommendation of early consultation" and "Cancer prevention and cancer screening"
Passive smoking preventive measures and non-smoking guidance	● Since April 2020, smoking in Company buildings has been prohibited (excluding designated smoking rooms). ● Implementation of guidance on how to quit smoking at the on-site clinic or other clinics or via website For employees who wish to stop smoking, an occupational health care professional will provide individual guidance.

Preventing harassment

In order for all Nippon Steel employees to work with vigor, it is extremely important to respond appropriately to harassment issues, and we are strengthening our efforts to prevent them.

Specifically, we have clarified our internal policies to prevent harassment in terms of working regulations and internal regulations, and we have also prepared and distributed leaflets to promote awareness among all employees. In addition, we engage in education through e-learning for all officers and employees, and through sponsoring lectures on harassment at milestone training events, spanning activities from new employees to higher management. In addition to continuing these efforts, we incorporated our awareness of the matter of unconscious bias into our training programs in fiscal 2021. We will continue such periodical reviews of the content of training programs.

Dedicated consultation and reporting points of contact have been established so that employees who face a harassment issue can consult with other people, in addition to someone close to themselves, such as their supervisor or co-worker. We are striving to create an environment wherein a harassment issue can be resolved without the employee concerned taking it on all alone.

Each of the contact points takes individual actions and makes sure not to disbenefit anyone for reporting or cooperating. After investigating and confirming the existence of a problem, we take strict measures in accordance with employment rules and other regulations.

Empowerment of the elderly and the disabled

Employment for the elderly

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

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

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

Employment for the disadvantaged

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

Since 2007, we have established special-purpose companies to expand employment opportunities. As of June 2022, at four special subsidiaries of NS Heartful Service East Nippon Ltd., NS Heartful Service Tokai Ltd., NS Heartful Service Kansai Ltd., and NS Heartful Service Kyushu Ltd., over 100 people are actively engaged mainly in various outsourced work from Nippon Steel. The work includes data input and printing of written documents, cleaning of the steelworks premises, cleaning and management of the welfare facilities, and cleaning of work clothes.

Employment rate of the disabled (as of June 2022)	2.40%

Work scenery at one of the special-purpose subsidiaries

Human Resources Development

4. Human resources, and diversity & inclusion

Based on the belief that the development of excellent personnel is a prerequisite for the development of excellent technologies and the production of excellent products, Nippon Steel is striving to enhance workplace strength and technological advancement and to improve its overall manufacturing capabilities.

Initiatives for human resources development

Basic Policy for Human Resource Development

Recognizing that the source of competitiveness is the power of people, Nippon Steel's Management Principles state that "we develop and bring out the best in our people to make our Group rich with energy and enthusiasm," positioning human resource (HR) development as a priority theme. A goal of HR development is to create people who can understand and implement our Corporate Philosophy and our Employee Action Guidelines. With this in mind, each employee shares in taking the lead in HR development.

Nippon Steel's basic approach to HR development is for supervisors to transfer to their subordinates, through daily dialogues on the job, understanding and knowledge of criteria for judgment and of operational skills. In order for this mindset to be shared by all employees, the following Basic Policy for Human Resource Development has been adopted.

Number of training/learning hours (FY2021)	0.54 million hours/year (19 hours/year per employee)

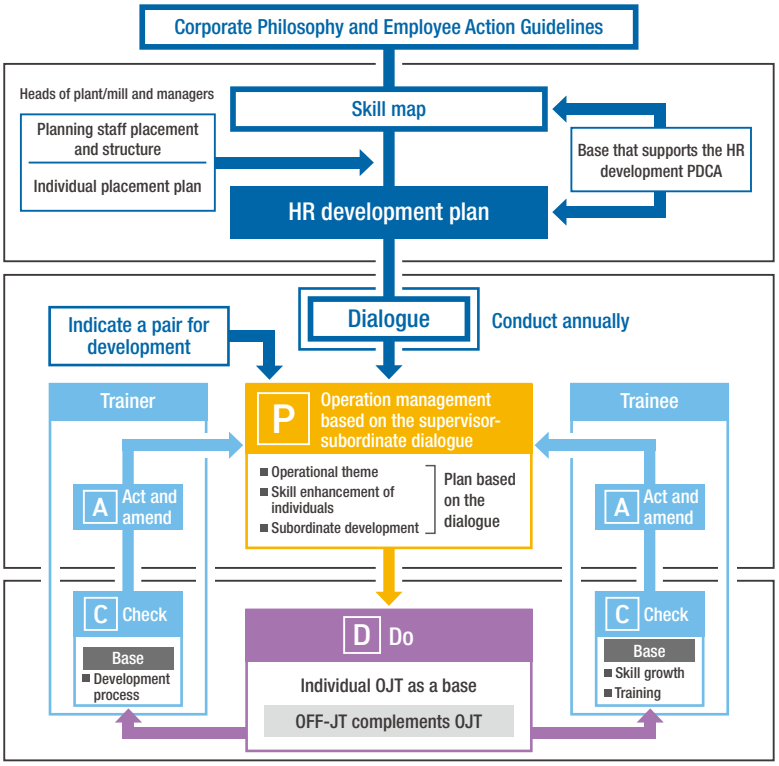
Basic Policy for Human Resource Development

1. HR development is the job itself, and supervisors play an important role in HR development.
2. OJT training is a basis of HR development and is complemented by off-the-job training.
3. Supervisors share objectives and outcomes of HR development clearly with their subordinates.
4. Each individual strives for continual personal improvement for further growth.

Personnel development of operators and maintenance staff

The operators and maintenance staff put into practice their accumulated skills in steelmaking and maintenance, starting from joining the Company, on the assumption of continued long-term employment to retirement. They thus fundamentally support the Company's manufacturing worksites. Smooth transmission of technology and skills from veterans to younger workers is essential and a system that facilitates this is needed. Therefore, after identifying, through a supervisor-subordinate dialogue, the skill or skills to be acquired, a skill development plan is developed and carried out. Training is conducted mainly through On-the-Job Training (OJT), and the HR Development PDCA is kept up to date for use by repeatedly revising and implementing the development plan based on the progress of individuals.

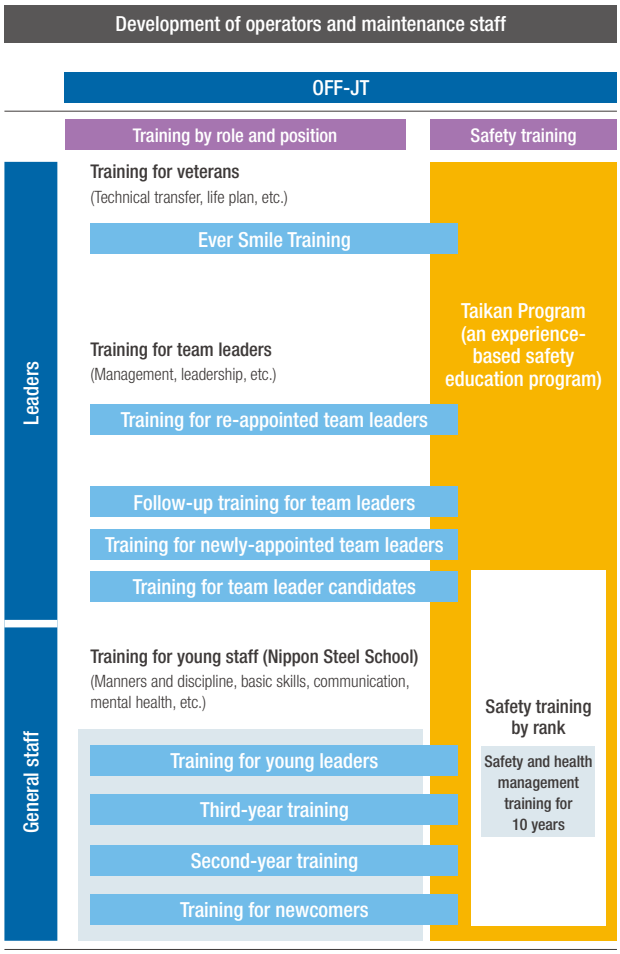
Human resource development PDCA (conceptual rendering)



Off-the-job training (OFF-JT), which complements OJT, is used throughout the Company by organizing the minimum skills and knowledge required by each rank of employees of Nippon Steel into a company-wide standard system. Through this, we work at education of workplace leaders to further increase their ability to add to and improve our knowledge base from the field ("field technology") and at measures to maintain and improve motivation of the elderly to continue working with health and motivation.

We are also actively promoting cooperation in HR development with partner companies, which play an important role in our steelmaking, from the perspective of deepening and expanding our partnerships. Specifically, in addition to the training of each partner companies, the training programs for various ranks of employees of these partner companies, such as newcomers, young staff, job leaders, and line managers are provided with Nippon Steel's employees as instructors. Through these efforts, we support the HR development of our partner companies, encourage exchanges between our on-site employees and their employees, and establish a foundation for smooth business execution.

Another area we focus on is to diversify recruitment sources (especially for female employees and mid-career recruitment), and we strive to create a workplace climate in which diverse personnel can be motivated and collaborate with each other through human rights awareness and harassment prevention.

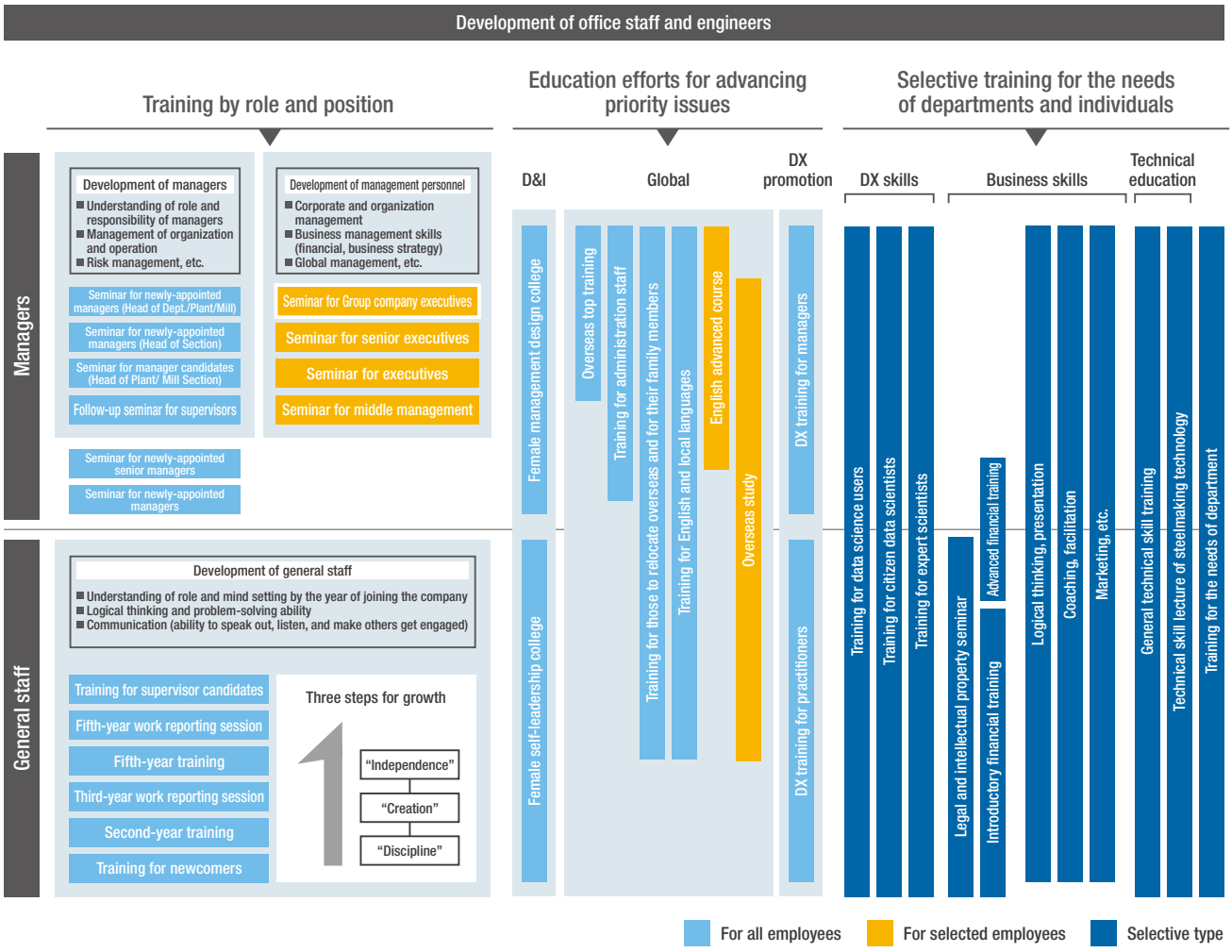


Note: In addition to the above, training to impart and improve knowledge and skills needed for partner companies' employees by rank (newcomers, young staff, team leaders, job leaders, and line managers) with Nippon Steel's employees as instructors is available.

Personnel development of office staff and engineers

Following the Basic Policy for HR Development, Nippon Steel uses a HR Development PDCA for office staff and engineers, who implement OJT-based HR development plans. Specifically, development plans are formulated for each person based on the Corporate Philosophy, Employee Action Guidelines, and organizational strategies. Based on a concrete one-year plan, a supervisor and a subordinate have an extended dialogue throughout the OJT period, review the development situation at year-end, and formulate the next year's plan.

The OFF-JT is also being enhanced to complement the OJT. Various training programs are aimed at acquiring the knowledge and skills required for each qualification and position. An employee's period of time from joining the Company to becoming a manager is divided into three steps: "Discipline", "Creation" and "Independence". Work reporting sessions and training by rank are carried out at the milestones of the 2nd, 3rd, or 5th anniversaries of the start of employment. In addition, selective training to improve the skills needed for work, and technical education programs to systematically learn the knowledge needed for our engineers are available. These can be taken based on individual development needs upon the supervisor-subordinate dialogue.



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

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

"Independence": Through experience of working according to their own responsibility, the employees develop their leadership skills. Together with development of skills, when they reach this phase they must also pay close attention to the development of their subordinates or junior colleagues.

Development of managers

The training courses are provided to managers to match the managers' qualification and position, and are given so that they can acquire proper understanding of their responsibilities and authority as managers; knowledge, skills, and mindset that contribute to enhancing their management as supervisors; and group management capabilities. In recent years, we have given increased attention to management education. We added new courses including one for line manager candidates to enhance line management skills on the manufacturing field, and one for new managers to ensure they have a correct understanding of their roles and responsibilities as managers, and acquire the risk management and job and organizational management skills.

Development of staff who support technological advancement

In order to train human resources that achieve world-leading technologies and manufacturing capabilities, courses to learn the essential knowledge and technologies for steelmaking engineers are prepared. In particular, the content of courses classified as steelmaking process-specific technologies is at the core of Nippon Steel's technology. We have developed an environment in which we can learn from basic technologies to advanced technologies, with excellent in-house engineers as instructors.

Global personnel development

For our employees to effectively work in any country where we are active, we provide pre-assignment training aimed for them to acquire basic knowledge to do business in the country and understand cultural differences. We have also set standards for English language skills to be reached by each level, and are working to raise the overall level of our group. For those whose job requires English skills, there is a program aimed at raising their proficiency level in English so that they can perform their jobs overseas without need for translators or interpreters.

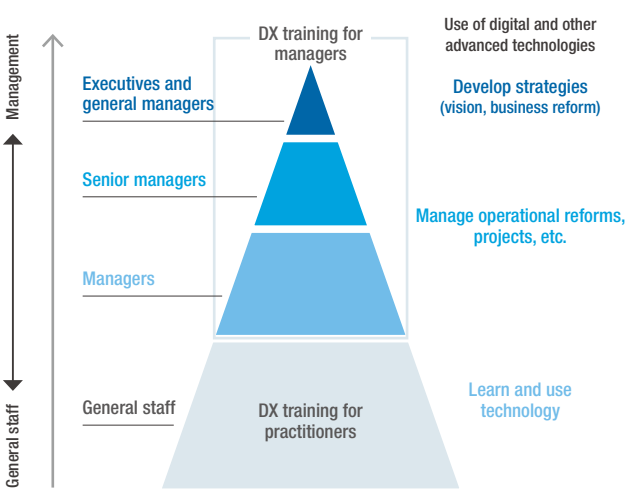
Further, to train future players of our domestic and overseas businesses, middle-management seminars are designed for young managers to acquire the knowledge, skills, and mindset necessary for business management.

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

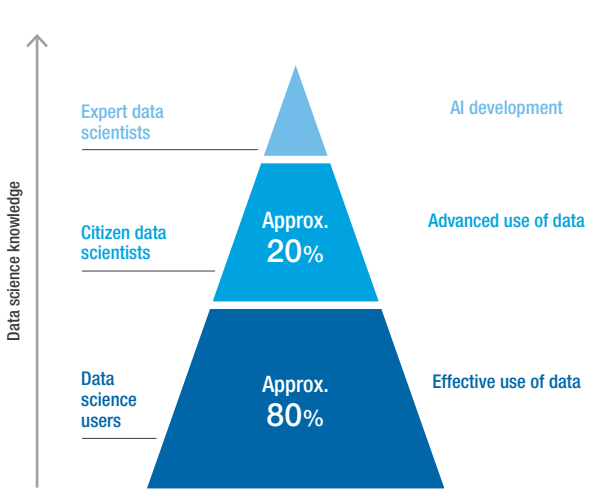
Development of staff who drive DX

We are developing human resources in both digital management and data science. As for digital management education, we began to educate all managers to understand their role in the promotion of DX and encourage them to change their mindset, so that they can facilitate operational process reform using digital technology. As for data science education, our goal is to develop DX skills training to enable all office staff to become data science users who can effectively use data by 2030, and to develop 2,000 or more citizen data scientists who can make advanced use of data. Through the education from these two aspects, we intend to accelerate our production and business process reform, using data and digital technology.

Digital Management Training



Data Science Training



Initiatives on Safety and Disaster Prevention

1. Safety, environment, and disaster prevention

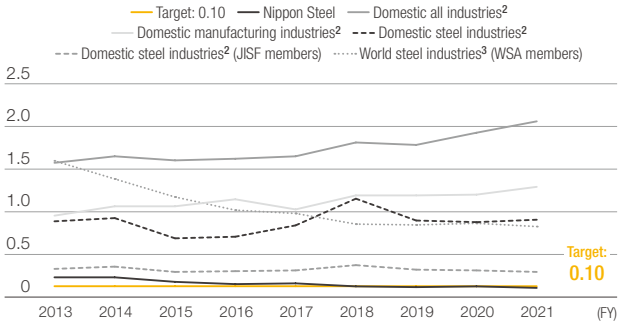
In keeping with the corporate philosophy that "safety and health are the most valuable factors that take precedence over all other things and they are the basis that supports business development," the Nippon Steel Group has firmly adhered to its manufacturing values, which include observing the principles of prioritizing safety, protecting the environment, and preventing disasters.

Safety and health initiatives

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

We make a risk assessment when planning a new project and regularly conduct safety and risk assessment for existing projects, to prevent accidents and reduce risks. We also seek for greater safety of equipment even when such equipment is essentially safe, and take countermeasures against human error. We also actively promote use of IT in safety measures, such as checking worker location data via GPS, safety surveillance cameras, and helmet-mounted cameras. We conduct analysis of actual accidents for prevention of similar accidents and make known effective examples of accident-preventive measures. As a result of continuous execution of these measures, safety improved in fiscal 2021. There were 6 accidents for Nippon Steel's employees[1] and 10 for employees of subcontracting companies (including zero fatal accident for Nippon Steel and two in sub-contracting companies) The accident frequency rate was 0.08 (compared to Japan's steel industry average of 0.90) and the accident severity rate was 0.10 (vs. 0.21). We will continue to strive for a safe work environment with the safety wellness targets for fiscal 2022 that are zero fatalities/severe accidents and less than 0.10 as the accident frequency rate.

Accident frequency rate



1 Nippon Steel's employees include seconded employees as well as temporary and part-time workers, and those dispatched to Nippon Steel.
2 JISF "Safety Management Overview, 2022"
3 World Steel Association, Safety and health 2021 metrics report

$$\text{Accident frequency rate} = \frac{\text{Number of accidents and recordable incidents, accompanied by lost work time}}{\text{Total number of hours worked by all employees}} \times 1{,}000{,}000$$

Target

Accident frequency rate **0.10** or less
Zero fatalities accidents

Acquisition of third-party certification

Nippon Steel's 12 steelworks and offices acquired the ISO (JIS Q) 45001 Health and Safety certification (published in March 2018) as of April 2022. We target to acquire the certification for all our steelworks and offices.

Acquisition of ISO (JIS Q) 45001 certificates	
FY2019	Kansai Works Wakayama Area
FY2020	Amagasaki Area and Osaka Area of Kansai Works; Nagoya Works; Kyushu Works Oita Area; East Nippon Works Kashima Area
FY2021	Naoetsu Area and Kimitsu Area of East Nippon Works, North Nippon Works Muroran Area, Setouchi Works Hirohata Area
FY2022	North Nippon Works Kamaishi Area, Kyushu Works Yawata Area

Kashima Area's ISO (JIS Q) 45001 Health and Safety certification

Safety training

We make efforts to improve training for accident prevention. The safety training programs are attended by all newly-appointed managers of manufacturing worksites (42 managers in fiscal 2019, 81 in fiscal 2020 and 80 in fiscal 2021). Our Taikan 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.

Efforts Toward Safety and Health Management https://www.nipponsteel.com/en/csr/safety/index.html

Disaster prevention initiatives

Initiatives to reduce disaster risks

Nippon Steel's Plant Safety Division is promoting initiatives for risk reduction in disaster prevention by working in three areas of focus: 1) corporate-wide implementation of measures against risks that emerge from instances of disaster, to prevent recurrence; 2) identification of disaster occurrence risks based on risk assessment plant by plant and by each of their process technology divisions; and implementation of tangible/intangible measures to reduce risks and control residual risks; and 3) voluntary monitoring (auditing) concerning appropriate implementation of 1) and 2), by persons in charge of disaster prevention in each works; understanding of the control status through sessions with managers at the head office; and implementation of corrections, if needed. Targeting zero serious disaster-related accidents, we promote essential disaster prevention improvement measures in manufacturing sites.

Specific disaster prevention initiatives

Target **Zero** serious disaster-related accidents

1 Prevention of disaster recurrence (mitigating risks exposed by disaster)
- Enhance drills for initial response (drills at all plants in all steelworks; enhanced drill programs; use of dedicated training facilities, improvement of hazard sensitivity by use of CG, etc.)
- Improve fire-fighting capacity of the in-house fire defense function, in cooperation with experts (joint fire drilling with public fire fighters; training for leaders, etc.)
- Prevent forgetting past incidents and accidents (panel presentations in training facilities; session to learn about past incidents during training)

2 Disaster prevention risk assessment (identification of new potential disaster risk)
- Identify and assess risks in manufacturing sites based on the corporate-wide guidelines; manage residual risks; and develop and promote permanent measures
- Identify accident risks related to operating processes and facility design and promote the drafting of permanent measures by outside experts and the process technology division in the head office
- Strengthen disaster prevention management in the facility measures of the Medium to Long-Term Management Plan

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

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

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

6 Measures against earthquakes and tsunami and measures for natural disaster mitigation
- Promote measures against earthquakes in the order of 1) human injury prevention, 2) area damage prevention, and 3) production measures
- Prepare procedures, carry out practical training, and devise measures for disaster mitigation to the nine categories of natural disasters (earthquakes, tsunamis, typhoons, heavy rains, floods, lightning, landslide disasters, blizzards, volcanic eruptions)

7 Group companies disaster prevention management
- Meetings to enhance coordination for disaster prevention management; individual visits to a workplace where a disaster or accident happened or which has risks related to disaster prevention

Initiatives on Quality

2. Quality

As part of our efforts to provide customers with products and services that are trusted and satisfy, the Nippon Steel Group strives to improve quality by ensuring that all employees involved in manufacturing and service are engaged in quality control and quality assurance.

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

As a basic policy in line with the Japan Iron and Steel Federation's guideline, aimed at strengthening the quality assurance system, we are promoting 1) the enhancement of education on quality compliance (compliance with laws and regulations), 2) activities to reduce behavioral risks, and 3) advanced internal quality audit. Information on quality-related examples is promptly shared across the Group and at appropriate times measures are launched to resolve issues through standardization, systemization, automatization, and other action. These measures are then implemented to enhance identification management of actual products and to improve reliability of testing and inspection. In addition, the five defined basic rules of quality behavior, formulated in fiscal 2021, have been made known to all employees, with a focus on improving the awareness in quality compliance and preventing quality problems to occur.

Specific initiatives

1 Enhancement of education on quality compliance
- Enhancement of quality compliance education opportunities (ICT utilization, e-Learning)
- Spread and retention of the five basic rules of quality behavior (posters in the workplace, education for all employees, preparation of a personal code of conduct)
- Promotion of standardization and improvement in capacity of staff

2 Activities to reduce behavioral risks (risks of human intervention)
- Enhanced identification management and reliability of testing and inspection by promoting automation and systemization
- Follow-up on the effectiveness of the system to prevent rewriting of test results

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

Initiatives on Production and Supply Chain Management

3. Production

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

Sustainable procurement efforts

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

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

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

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

In fiscal 2018, about 1,300 suppliers attended our first Partners Meeting, where we asked them to cooperate in strengthening partnerships to improve manufacturing competitiveness and in promoting procurement activities to achieve the goals of the SDGs. In 2021, we held the second Partners Meeting, and, in addition to conveying the same message as in the first meeting, we shared our commitment to sustainable development of our entire supply chain with the suppliers, who are our business partners.

Basic policy on equipment procurement

1. Compliance with laws
2. Equal opportunities
3. Building of a partnership
4. Fair disclosure of information and quick transaction processing
5. Consideration to resource protection and environmental preservation
6. Preservation of confidentiality

Consideration to reducing environmental impact in procurement activities

Based on the Life Cycle Assessment concept, Nippon Steel is taking initiatives in reducing environmental impact at various points along the supply chain. In keeping with rising demand for tighter management of chemical substances, we have created management standards for 16 toxic chemical substances, 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 NGOs, we have taken the initiative in developing a framework to prioritize the purchasing of products and services that represent less environmental load.

Toxic material management concerning quality assurance

https://www.nipponsteel.com/en/csr/customer/support.html

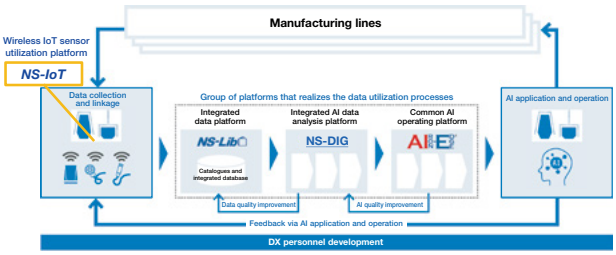
Optimal management of manufacturing and shipping

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

Efforts to stabilize production

In collaboration with NS Solutions and Nippon Steel Texeng, we have constructed NS-IoT, a wireless IoT sensor utilization platform that centrally manages data of multiple steelworks by using LPWA (Low Power Wide Area wireless communication) and cloud technology. The platform was put into operation in April 2022 in the Kimitsu Area and Kashima Area of the East Nippon Works.

The NS-IoT enables centralization of collection of data from steelworks for efficient data analysis, and enables creation of data-driven production processes that allow for both location-independent evaluation of facility performance and detection of changes. Utilizing a wide range of data collected via the NS-IoT and others, we aim to accelerate formalization and standardization of our proprietary technologies, including tacit knowledge of know-how, etc., improve labor productivity by using automation and predictive detection, and enhance production stability and quality improvement by advanced production technology.



Dealing with the workforce shortage in domestic logistics

Approximately 60% of our domestic steel products are transported by about 200 coastal ships, which provide the primary means of transportation for industrial logistics.

In the coastal shipping industry, as in other logistics industries, the shortage of workers has been a problem. Many operators (shipowners) in the coastal shipping industry are small or medium-sized business persons and find it difficult to recruit and train new sailors even if they are willing, because extra cabin space cannot be installed and the crew members find it burdensome to teach newcomers. The Nippon Steel Group has therefore built a practical training ship, *Reimei*, and started its operation as one of ways to secure crews. This practical training ship, which is well designed with cabin space for an instructor and up to five trainees students, comfortable living space, a bridge and a dining room, is greatly contributing to the development of new sailors.

We will continue to make efforts for the sustainable development of domestic industrial logistics.

Practical training ship *Reimei*

Solution proposals to meet customer needs

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Nippon Steel has been making advances in the development of solutions for the next-generation steel car concept NSafe™-AutoConcept (NSAC), which was announced in 2019. In anticipation of the performance required for each component of a next-generation steel car, which must embody substantial weight reduction and improved safety, we have been developing, in NSAC, advanced materials, as well as component structures (to maximize material performance) and processing technologies (for these structures).

At present, the automobile environment is facing many changes including CASE, MaaS and the call for carbon neutrality, and various functions have become required for the vehicle body and components. Against this background, Nippon Steel is expanding the application range of NSAC technology for next-generation steel vehicles and is strengthening efforts to create value for customers and society by so doing.

Together with Local Communities

5. Together with local communities

Nippon Steel has many manufacturing bases all over Japan and are engaged in business activities rooted in local communities. In accordance with our attitude of maintaining harmony with local communities and society, we are promoting a wide range of activities, including promotion of environmental preservation, support in education and sports, mecenat (in French, mécénat, meaning sponsorship or patronage) of art and culture, holding dialogues with shareholders and investors, and coordinating with government bodies.

Environment preservation activities, jointly with local communities

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

Kashima City coastal clean-up

In the East Nippon Works Kashima Area, we are conducting coastal cleaning activities in cooperation with Kashima City, Kashima City Tourism Association, Kashima Coast Protection Association, Kashima Junior Chamber, and Kashima City Construction Cooperative Association. Since the start of this activity in 1984, the cleaning area has been gradually expanded. In 2022, approximately 1,400 people participated and collected 15 tons of trash. (Due to the COVID-19 pandemic, the activity was suspended in 2020 and 2021.)

This continued activity with residents in the community has received numerous awards. In April 2021, Nippon Steel's East Nippon Works Kashima Area received a Medal with Green Ribbon as an Environmental Beautification Association.

Participation in activities of the "*Mori wa Umi no Koibito*" NPO

We are also a regular corporate member of the NPO, *Mori wa Umi no Koibito*, represented by Mr. Shigeatsu Hatakeyama, a fisherman raising oysters and scallops in Kesennuma City, Miyagi Prefecture, who received the Forest Heroes award from the United Nations in 2012.

The NPO's activities are based on a scientific mechanism according to which the ecological linkage of forests, villages and sea nurtures the blessings of the sea forest. In other words, the forestation leads to an increase in iron-humic acid that flows down rivers, and which enriches growth of oysters and scallops near the river mouth. Since 2012 we participated in the NPO's tree planting activity at Murone Mountain in Iwate Prefecture, which began in 1989. In 2022, our employees participated in the 34th round of tree planting activity.

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

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

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

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

- Voicing opinions on deregulation and institutional reform aimed at maintaining and improving the vitality of the Japanese economy
- Participation in public policy studies, such as infrastructure development, revision of the Corporate Governance Code, Sustainability Standards Board of Japan (SSBJ), tax reform, Digital Transformation (DX), workstyle reform and regional revitalization
- Recommendations on national strategy to achieve a "virtuous cycle of environmental sustainability and economic growth," the need for policies that will strengthen the international competitiveness of industries, and energy policy
- Promotion of voluntary initiatives by industry to achieve Japan's medium- to long-term targets based on the Paris Agreement (Carbon Neutral Action Plan)
- Participation in the JISF's formulation of Basic Policies for the Japanese Steel Industry on Carbon Neutral in 2050

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

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

Fair tax payment

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

Efforts to enhance dialog with shareholders and investors

To achieve sustained growth and improve corporate value over the medium to long term the Company has adopted the Basic Policy for Information Disclosure and Dialogue with Shareholders and Investors. We strive to proactively provide information and cooperatively respond to questions raised by shareholders at the General Meetings of Shareholders. In addition, we regularly hold corporate briefings and plant tours, and publish interim reports for shareholders to promote shareholders' understanding and enhance communication with them. (In fiscal 2021, we did not conduct plant tours, to prevent the spread of COVID-19 infections.)

For institutional investors we host briefings on quarterly results, provide visits to steelworks and research centers, and hold 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. Explanatory meetings on DX and other measures are also held as appropriate.

Visit to steelworks

Support for educational activities

Monodzukuri and environmental education

With the aim of showing the joy of product-manufacturing, Nippon Steel holds demonstrations on "*tatara* ironmaking" — Japan's indigenous ironmaking technique. Every year we are host to approximately 130,000 people at our plant visits in order to make Nippon Steel as well as the steel industry to be better understood. In fiscal 2021, the COVID-19 pandemic made it difficult to undertake these programs. We therefore sent lecturers from steelworks or branch offices to special occasions in the local communities, upon requests of the latter. In addition, on-line learning sessions were provided at the East Nippon Works Kashima Area and we accepted teachers for the on-line private company training program.

Class with a lecturer from Nippon Steel (Nagoya)

Internship programs and the endowment of a university course

For many years, Nippon Steel has been internship opportunities to students to help them learn our business and gain some work experience. We also endow university courses, which are related to technological innovation (one of our business strategies) and "carbon neutrality in 2050" objective.

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

Activities in the support of music

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

Activities in the support of sports as a social contribution

Nippon Steel manages or supports sports teams in the local communities of its steelworks. These include a judo club, which has produced Olympic medalists; baseball teams, which have sent many of its players to the professional leagues; a football team, a rugby team, and a volleyball team. All of these teams also contribute to their local community through such various activities as sports classes for children, coaching of junior teams, and making our athletic facilities available to local residents for games and training. Together with local residents who support our teams, we strive to provide renewed vigor to our local communities, and at the same time to support their healthy lifestyle.

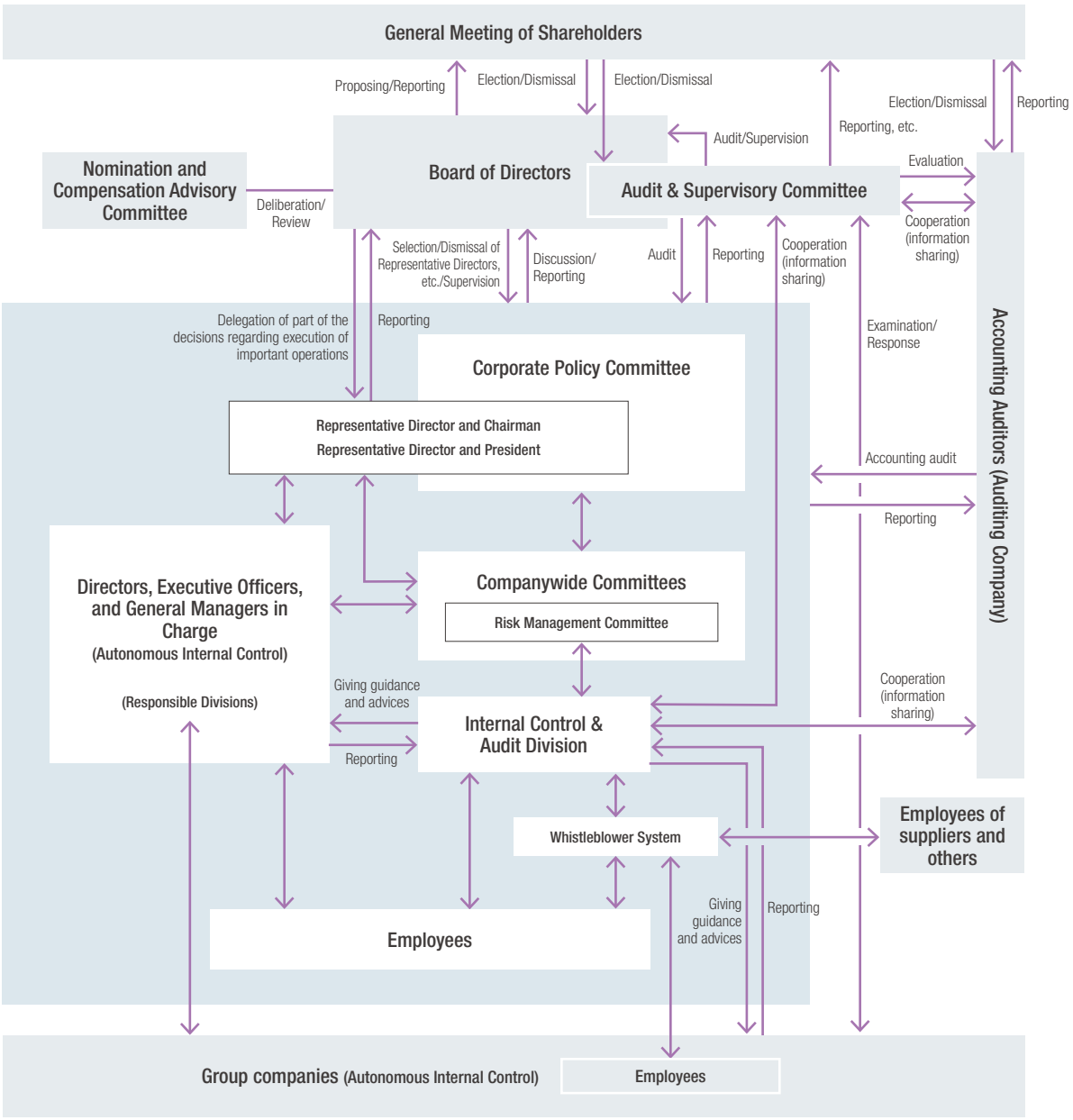
Corporate Governance

Thorough implementation of compliance

The Nippon Steel Group is engaged in business activities based on its Corporate Philosophy — that we will pursue world-leading technologies and manufacturing capabilities, and contribute to society by providing excellent products and services. Heeding that Philosophy, the Nippon Steel Group has established a corporate governance system suited to the businesses of the Nippon Steel Group in order to achieve the sound and sustainable growth of the Nippon Steel Group and increase its corporate value over the medium- to long-term, in response to the delegation of responsibilities by and trust of all stakeholders, including its shareholders and business partners.

Basic policy of corporate governance

Nippon Steel has adopted a company structure with an Audit & Supervisory Committee. This is because Nippon Steel strives to speed up management decision-making, enhance discussions on the formulation of management policies and management strategies at the Board of Directors by prioritizing items to be discussed, and strengthen the supervisory function of the Board of Directors.



1 Corporate governance system

Currently, the Board of Directors of Nippon Steel is comprised of 14 members, of whom nine are Directors (excluding Directors who are Audit & Supervisory Committee Members) and five are Directors who are Audit & Supervisory Committee Members. Outside Directors account for more than one-third (five out of 14, including one female outside director) of all members of the Company's Board of Directors.

By all Directors appropriately fulfilling their respective roles and responsibilities, prompt decision-making is achieved corresponding to changes in the management environment, and multifaceted deliberations and objective and transparent decision-making by the Board of Directors are secured. In addition, Directors who are Audit & Supervisory Committee Members have voting rights on the Board of Directors regarding decisions on proposals for the election and dismissal of Directors as well as on election and dismissal of Representative Directors, and other decisions in general regarding business execution (excluding decisions that have been delegated to Directors). The Audit & Supervisory Committee has the authority to give its opinions at the General Meeting of Shareholders regarding the election, compensation, etc. of Directors, excluding Directors who are Audit & Supervisory Committee Members. This structure strengthens the supervisory function of the Board of Directors over management.

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

As corporate organizations engaging in deliberations before the Corporate Policy Committee and the Board of Directors, there are 22 company-wide committees in total, including the Risk Management Committee, the Environment Management Committee, and the Green Transformation Promotion Committee as of April 1, 2022.

2 Internal control system

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

3 Risk management

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

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

Director skills matrix

We believe that our Board of Directors, as a whole, must have the necessary skills and experience based on our Group corporate philosophy, medium- to long-term management plan, etc. The main skills and experience possessed by each Director are as presented in the table below.

Name	Position	Corporate Planning / Business Strategy	Finance / Accounting, Monetary / Economy	Personnel / Labor Affairs / HR Development	Governance / Risk Management / Legal / Compliance	Technology / R&D	Sales / Purchas / Marketing	Global	Environment / Sustainability	Public Administration / Public Policy
Directors (Excluding Directors who are Audit & Supervisory Committee Members)										
Kosei Shindo	Representative Director and Chairman	●		●	●				●	●
Eiji Hashimoto	Representative Director and President	●			●		●	●	●	
Akio Migita	Representative Director and Executive Vice President	●		●	●				●	
Naoki Sato	Representative Director and Executive Vice President				●	●			●	
Takahiro Mori	Representative Director and Executive Vice President	●	●				●	●		
Takashi Hirose	Representative Director and Executive Vice President	●					●	●		
Tadashi Imai	Managing Director	●			●	●			●	
Tetsuro Tomita	Director (Outside Director)	●		●	●			●		
Kuniko Urano	Director (Outside Director)			●	●				●	
Directors who are Audit & Supervisory Committee Members										
Shozo Furumoto	Senior Audit & Supervisory Committee Member (full-time)				●			●		●
Masayoshi Murase	Audit & Supervisory Committee Member (full-time)		●	●	●					
Seiichiro Azuma	Audit & Supervisory Committee Member (Outside Director)		●		●			●		
Hiroshi Yoshikawa	Audit & Supervisory Committee Member (Outside Director)		●		●			●		●
Masato Kitera	Audit & Supervisory Committee Member (Outside Director)			●	●			●		●

Note: The check mark indicates the main skills and experience (up to four in principle) possessed by each Director, based on their career history and experience.

Independent Assurance Report

Independent Assurance Report

To the Representative Director and President of Nippon Steel Corporation

We were engaged by Nippon Steel Corporation (the "Company") to undertake a limited assurance engagement of the environmental performance indicators marked with ★ (the "Indicators") for the period from April 1, 2021 to March 31, 2022 included in its Nippon Steel Sustainability Report 2022 (the "Report") for the fiscal year ended March 31, 2022.

The Company's Responsibility

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

Our Responsibility

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

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

Conclusion

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

Our Independence and Quality Control

We have complied with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which includes independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. In accordance with International Standard on Quality Control 1, we maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

/s/ Kazuhiko Saito
Kazuhiko Saito, Partner, Representative Director
KPMG AZSA Sustainability Co., Ltd.
Tokyo, Japan
October 13, 2022

Notes to the Reader of Independent Assurance Report:
This is a copy of the Independent Assurance Report and the original copies are kept separately by the Company and KPMG AZSA Sustainability Co., Ltd.

Awards Received in FY2021[1]

Award name	Sponsor	Detail
2021 Innovation Award	Schneider Electric (France)	The advanced technology of grain-oriented electrical steel sheets used in Schneider's strategically important distribution transformers (Nippon Steel)
2021 Award for Excellence in Corporate Disclosure (27th) in Steel/Non Ferrous Metal Industry Category, ranked first for two consecutive years	Securities Analysts Association of Japan	Recognized for an increase in opportunities to disseminate information from the top management, and their clearer message. The Company disclosed its medium- to long-term management plan and Carbon Neutral Vision 2050 and fully explains their progress and concrete measures for achieving them. Its integrated report discloses non-financial information, which may lead to improvement of its corporate value in the medium- to long-term. (Nippon Steel)
The 68th Okochi Prize "Production Prize"	Okochi Memorial Foundation	Hot rolling technology of high-strength steel sheets by measurement and control adapted to harsh environments (Nippon Steel)
Environmentally Sustainable Company at the 3rd ESG Finance Awards Japan	Ministry of the Environment	Extensive disclosure of "Risks, Business Opportunities and Strategy," "KPI" and "Governance" concerning important environmental issues (Nippon Steel)
The 54th "Ichimura Prize in Industry for Distinguished Achievement" and "Ichimura Global Environmental Prize in Industry for Distinguished Achievement"	Ichimura Foundation for New Technology	● Ichimura Prize in Industry: Development of new brake pads for Shinkansen (Nippon Steel) ● Ichimura Global Environmental Prize in Industry: Development of a low-energy separation and recovery system for CO_2 in plant exhaust gas (Nippon Steel, Nippon Steel Engineering, and the Research Institute of Innovative Technology for the Earth)
2021 MEXT Minister's Award "Prize for Science and Technology (Development Division)"	Ministry of Education, Culture, Sports, Science and Technology (MEXT)	Development of the NSafe™-Auto Concept, an ultra-high-strength steel sheet processing technology that supports the evolution of automobiles (Nippon Steel)
2022 Steel Sustainability Championship	World Steel Association	Sustainability activities such as measures demonstrating strong environmental commitment, and measurement and disclosure of various data based on environmental policies; and publication of Sustainability Reports to stakeholders (Nippon Steel)
Red Dot Design Award 2022	Nordrhein Westfalen Design Center (Germany)	Contributing to urban development and to the improvement of the living environment through products including TranTixxii™ titanium which enables good design appearance (Nippon Steel)
2022 National Commendation for Invention	Japan Institute of Invention and Innovation	Invention of a hull structure with excellent collision safety using high-ductile steel plates (Nippon Steel, National Institute of Maritime, Port and Aviation Technology and Imabari Shipbuilding Co.)

1 Includes some awards received in April–June 2022

Corporate profile (as of March 31, 2022)

Name	Nippon Steel Corporation
Head office	2-6-1 Marunouchi, Chiyoda-ku, Tokyo 100-8071, Japan
Establishment	April 1, 1950
President	Eiji Hashimoto
Capital	419,524 million yen (466,270 shareholders)
Stock listings	Tokyo, Nagoya, Fukuoka, Sapporo
Number of employees	106,528 (consolidated)
Group companies	378 consolidated subsidiaries 105 equity-method affiliates

External evaluation

Nippon Steel Corporation has been selected as a constituent of many indexes including the MSCI Japan ESG Select Leaders Index, FTSE Blossom Japan Index, FTSE Blossom Japan Sector Relative Index, and S&P/JPX Carbon Efficient Index (adopted by the Government Pension Investment Fund, GPIF) as well as the FTSE4Good Index Series and MSCI Japan ESG Leaders Indexes, which are widely used stock indexes. Nippon Steel was also selected as Environmentally Sustainable Company at the 3rd ESG Finance Awards sponsored by the Ministry of the Environment in fiscal 2021.

FTSE Blossom Japan Index

FTSE

FTSE Blossom Japan Sector Relative Index

FTSE Blossom Japan Sector Relative Index

FTSE4Good Index Series

FTSE4Good

MSCI Japan ESG Select Leaders Index

2022 CONSTITUENT MSCI JAPAN ESG SELECT LEADERS INDEX

MSCI ESG Leaders Indexes

2022 MSCI ESG Leaders Indexes Constituent

Ministry of the Environment Environmentally Sustainable Company at the 3rd ESG Finance Awards sponsored

2022 ESG FINANCE AWARDS JAPAN

Contact

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Or go to the "Contact Us" page of Nippon Steel's website: https://www.nipponsteel.com/en/contact

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