

Policy Engagement

Steel Industry Initiatives

The Japan Iron and Steel Federation (JISF) Initiatives

Long-term Vision for Climate Change Mitigation

JFE Steel is proactively engaged in a variety of activities as a member of the Japan Iron and Steel Federation (JISF). The JISF has been focusing on achieving the goals for 2020 under its Commitment to a Low Carbon Society (renamed the Carbon Neutrality Action Plan in FY2021). Furthermore, in November 2018, the JISF formulated and published its Long-term Vision for Climate Change Mitigation for 2030 and beyond, with JFE Steel playing a central role in its development. This document lays out the industry's challenge for realizing zero-carbon steel and explains the pathway for achieving the 2°C scenario for steelmaking and the necessity of ultra-innovative technologies to achieve the 1.5°C scenario. Also, on February 15, 2021, the JISF announced the "Basic Policy of the Japan steel industry on 2050 Carbon Neutrality sought by the Japanese government," declaring that the Japanese iron and steel industry will boldly accept the challenge of realizing zero-carbon steel.

► [Relevance with the JISF's Long-term Vision for Climate Change Mitigation](#) (P.106)

JISF's Carbon Neutrality Action Plan

In February 2021, the JISF declared that the Japanese steel industry will boldly take on the challenge of realizing carbon neutrality. The Plan on Commitment to a Low Carbon Society was amended and renamed as the Carbon Neutrality Action Plan, and the Phase II target (2030 target) was revised.

In the Eco Process of the plan, an ambitious 2030 target was set taking into account new perspectives such as the expansion of scrap use as well as the maximum introduction of best available techniques (BATs) based on energy efficiency already among the highest in the world.

Regarding Eco Product, which is intended to reduce GHG emissions at the product use stage, high-performance steel is expected to play a particularly major role in the promotion of offshore wind power and electrification of automobiles, which are among the 14 fields of the government's Green Growth Strategy. Accordingly, the Japanese initiative will accelerate practical global warming measures from a global perspective by making visible the conventional quantitative evaluation of the five types of high-performance steel.

As for Eco Solutions, the JISF will develop a system for introducing appropriate technology for transferring and spreading the production process for decarbonized steel in the Asian regions, where steel production is expected to expand.

Furthermore, regarding Innovative Technology Development, the JISF will take on the challenges of technologies such as direct hydrogen reduction and high-performance steel production using electric arc furnaces under the Green Innovation Fund, in addition to COURSE 50 and ferro-coke.

Overview of the Carbon Neutrality Action Plan

Eco Process

Cut energy-related CO₂ emissions (total volume) in FY2030 by 30% compared to the FY2013 level by adopting BATs to promote energy conservation, using waste plastics, adopting innovative technologies that are currently under development and scheduled to be in use around 2030, and using raw fuel with less CO₂ emissions.

Eco Product

Contribute to CO₂ emissions reduction by domestically and internationally supplying high-performance steel. This steel will reduce CO₂ emissions when used in the final product. The reduction potential in 2030 is estimated to be approximately 42 million t-CO₂ for the five steel products that have been quantitatively evaluated for their contribution to reducing emissions.

Eco Solution

Contribute to reducing CO₂ emissions worldwide by transferring and spreading the Japanese steel industry's advanced energy-saving technologies and facilities to the world's steel industry. Estimated contribution on CO₂ emissions reduction is 80 million t-CO₂ in 2030.

Innovative Technology Development

Contribute to carbon neutrality by boldly developing technologies in the following four areas.

- Hydrogen reduction technology using in-house hydrogen
- Low-carbon technology using CO₂ contained in externally sourced hydrogen or blast furnace exhaust gas
- Direct hydrogen reduction technology
- Impurity removal technology for electric furnace using direct reduced iron

Assessment of the FY2022 Carbon Neutrality Action Plan (Phase II) Results (JISF)

Total volume of energy-related CO₂ emissions in FY2022 was 150.23 million tonnes, which represents a decrease of 44.20 million tonnes, or 22.7%, compared to FY2013. The achievement rate of the FY2030 target (to reduce 30% from FY2013) has progressed to 75.8%. Energy-related CO₂ emissions and energy consumption are both declining, given continued energy-saving efforts.

While the energy efficiency of the Japanese steel industry is among the highest in the world, vigorous efforts are made to promote greater energy savings by having businesses engaged in this effort draw upon subsidies to promote investment in saving energy and other actions.

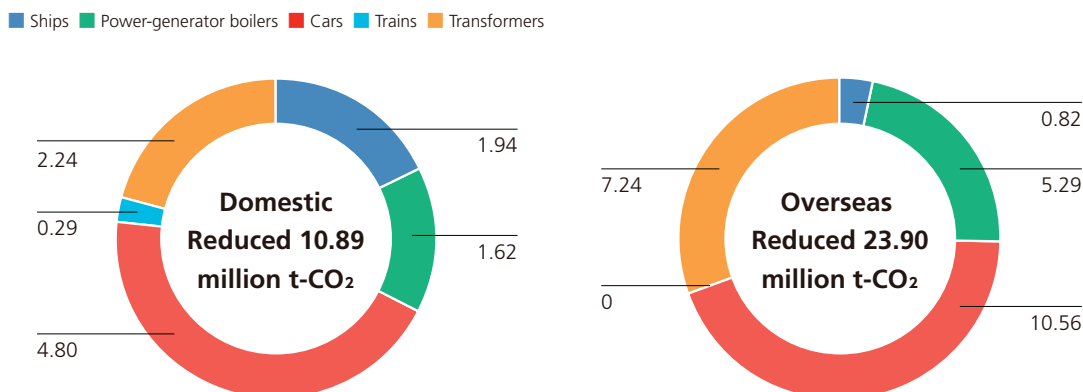
Reduced CO₂ Emissions through High-Performance Steel Materials (Effects of Eco Products)

The Japan Iron and Steel Federation (JISF) estimates the CO₂ emissions reduction impact of using high-performance steel materials. It is estimated that the use of five major high-performance steel materials in cars, transformers, ships, power generator boilers, and trains in Japan and overseas (FY2022 production: 4.36 million tonnes, 5.0% of crude steel production) helped reduce CO₂ emissions by 34.79 million tonnes (10.89 million tonnes in Japan, 23.90 million tonnes overseas) in FY2022.

Notes:

- Calculations made by the Institute of Energy Economics, Japan
- The five materials are steel sheets for automobiles, directional electrical steel sheets, thick steel sheets for shipbuilding, steel tubes for boilers, and stainless steel sheets.
- Domestic reduction figures are calculated in comparison with FY1990, while the overseas reduction figures are calculated in comparison with FY2003 for automobiles and ships, with FY1998 for steel pipes for boilers and FY1996 for electrical steel sheets.

CO₂ Reduction Resulting from the Use of Five High-Performance Steel Materials in Japan and Abroad (FY2022)



Related Links

- ▶ [The Japan Iron and Steel Federation \(JISF\): Climate Change Policy page](https://www.jisf.or.jp/en/activity/climate/index.html) (https://www.jisf.or.jp/en/activity/climate/index.html)
- ▶ [Japan Iron and Steel Federation \(JISF\): LCA of Steel Products page](https://www.jisf.or.jp/en/activity/lca/index.html) (https://www.jisf.or.jp/en/activity/lca/index.html)
- ▶ [Japan Iron and Steel Federation \(JISF\): Publication of ISO 20915](https://www.jisf.or.jp/en/activity/lca/iso/index.html) (https://www.jisf.or.jp/en/activity/lca/iso/index.html)
- ▶ [Japan Iron and Steel Federation \(JISF\): Publication of JIS Q 20915](https://www.jisf.or.jp/en/activity/lca/iso/index.html) (https://www.jisf.or.jp/en/activity/lca/iso/index.html)
- ▶ [Japan EPD Program by SuMPO](https://ecoleaf-label.jp/en/) (https://ecoleaf-label.jp/en/)

Initiatives in the Business Community

Initiatives in Green/Transition Finance

JFE Holdings has established the Green/Transition Finance Framework and issued transition bonds through a public offering in 2022, which was selected as the first model example in the iron and steel sector for METI's Transition Finance Model Projects in FY2021. Achieving carbon neutrality will require significant, long-term investments in capital and R&D. We will continue to leverage transition financing and diversify our funding methods.

Formulated the Technology Roadmap for Transition Finance in the Iron and Steel Sector

The technology roadmap for Transition Finance toward decarbonization in the iron and steel sector, published by the Japanese Ministry of Economy, Trade, and Industry (METI), outlines a path for accelerating decarbonization and achieving carbon neutrality by introducing innovative technologies, with the same assumption that social infrastructure such as hydrogen supply and CCUS will be in place by the 2040s. In the process of drawing up this roadmap, JFE Steel's Fellow, Hiroyuki Tezuka, a member of the Japan Iron and Steel Federation's Energy Technology Committee, participated as a specialist in the taskforce formulating the roadmap. The roadmap is aligned with Japan's nationally determined contribution (NDC) based on the Paris Agreement and is therefore aligned with the agreement.

Green/Transition Finance Framework

The JFE Group developed this framework based on the "Green Bond Principles 2021" of the International Capital Market Association (ICMA), the "Green Loan Principles 2023" of the Loan Market Association (LMA), the Asia Pacific Loan Market Association (APLMA), the Loan Syndication & Trading Association (LSTA), the "Green Bond Guidelines (2022)," the "Green Loan Guidelines (2022)" of the Ministry of the Environment, the "Climate Transition Finance Handbook 2023" of the ICMA, and the "Basic Guidelines on Climate Transition Finance (May 2021)" of the Financial Services Agency, the Ministry of Economy, Trade and Industry, and the Ministry of the Environment. Since our initiatives have been certified by a third-party organization as being aligned with METI's roadmap, this framework of the JFE Group is also aligned with the Paris Agreement.

- ▶ [METI: Technology Roadmap for Transition Finance in the Iron and Steel Sector](https://www.meti.go.jp/policy/energy_environment/global_warming/transition/transition_finance_technology_roadmap_iron_and_steel_eng.pdf) (https://www.meti.go.jp/policy/energy_environment/global_warming/transition/transition_finance_technology_roadmap_iron_and_steel_eng.pdf)
- ▶ [METI: Transition Finance Case Study](https://www.meti.go.jp/policy/energy_environment/global_warming/transition/transition_finance_case_study_jfeh_eng.pdf) (https://www.meti.go.jp/policy/energy_environment/global_warming/transition/transition_finance_case_study_jfeh_eng.pdf)
- ▶ [Green/Transition Finance Framework \(Japanese only\)](https://www.jfe-holdings.co.jp/common/pdf/release/2024/01/240119.pdf) (https://www.jfe-holdings.co.jp/common/pdf/release/2024/01/240119.pdf)
- ▶ [Transition Finance Report—Funds Raised, Allocated, and Their Impact \(Japanese only\)](https://www.jfe-holdings.co.jp/common/pdf/sustainability/environment/climate/impact_report_2024.pdf) (https://www.jfe-holdings.co.jp/common/pdf/sustainability/environment/climate/impact_report_2024.pdf)

Adoption Status for the Green Innovation Fund Projects

The JFE Group is fully leveraging the New Energy and Industrial Technology Development Organization (NEDO)'s Green Innovation Fund project, and we are conducting research and development in collaboration with other companies in the industry toward realizing carbon neutrality. JFE Steel is working on a NEDO project called Utilizing Hydrogen in Steelmaking Processes (GREINS), while JFE Engineering is focusing on carbon neutrality in the material cycles and waste management sector as well as on lowering the cost of offshore wind power generation.

Utilizing Hydrogen in Steelmaking Processes (GREINS)

JFE Steel formed a consortium with Nippon Steel Corporation, Kobe Steel, Ltd., and the Japan Research and Development Center for Metals and jointly commissioned the Utilizing Hydrogen in Steelmaking Processes (GREINS) project to achieve progress toward carbon neutrality by 2050. The project scale is approximately 573.7 billion yen*¹, and the four companies involved are receiving a total of approximately 449.9 billion yen*² of financial support.

*1 Source: Project summary document (May 24, 2024) on NEDO's Utilizing Hydrogen in Steelmaking (GREINS) project

*2 This includes incentives subject to change depending on project progress and other factors at each stage gate.

COURSE50

In the area of developing hydrogen reduction technologies that use in-house hydrogen, we intend to achieve a 30% reduction of CO₂ emissions through hydrogen reduction along with separation and capture of CO₂ from blast furnace gases. The first facility is expected to come online by 2030, followed by other plants by 2050. JFE Steel is in charge of examining the combustion behavior of pulverized coal and reduction furnace gas and evaluating the entire process.

▶ Project scale: Approx. 72.7 billion yen*¹, Financial support scale: Approx. 43.6 billion yen*² (total for the four companies)

*1 The project scale is calculated based on the level of financial support and the subsidy rate.

*2 This includes incentives subject to change depending on project progress and other factors at each stage gate.

Carbon-recycling pilot blast furnace

In the area of developing low-carbon technologies using CO₂ contained in externally sourced hydrogen or blast furnace exhaust gas by developing and combining these technologies with other low-carbon techniques, such as using biomass and reduced iron as raw materials, we hope to achieve a greater than 50% reduction of CO₂ emissions from the blast furnace steelmaking process by 2030 through the use of medium-scale test blast furnaces, which are larger than one-fifth the size of a full-scale furnace. JFE Steel is in charge of developing carbon recycling blast furnace operation technology and elemental technology as well as overall process evaluation and review.

▶ Project scale: Approx. 285.3 billion yen*¹, Financial support scale: Approx. 238.6 billion yen*² (total for the four companies)

*1 The project scale is calculated based on the level of financial support and the subsidy rate.

*2 This includes incentives subject to change depending on project progress and other factors at each stage gate.

Direct reduction compact bench pilot furnace

In the area of developing direct hydrogen reduction technology, we intend to demonstrate the method using medium-scale test blast furnaces, which are larger than one-fifth the size of a full-size furnace, applying a technology for directly reducing the CO₂ emissions of low-grade iron ore with hydrogen by more than 50%, compared to the current blast furnace method, by 2030. JFE Steel is in charge of examining operational fluctuations and wide-ranging methanation reaction characteristics using the new bench pilot furnace, investigating reduction pulverization and gas composition that both suppresses clustering and achieves a high reduction rate, evaluating the microstructure using high-precision equipment, determining gas composition and the level of iron ore reduction and carbonization, and optimizing shape and forming.

- ▶ Project scale: Approx. 136.9 billion yen*¹, Financial support scale: Approx. 114.1 billion yen*² (total amount for the four companies)

*1 The project scale is calculated based on the level of financial support and the subsidy rate.

*2 This includes incentives subject to change depending on project progress and other factors at each stage gate.

Pilot electric arc furnaces

In a project for developing impurity removal technology for electric arc furnaces using direct reduced iron, demonstrations of a large-scale electric arc furnace process (processing capacity of approximately 300 tonnes) will be conducted to verify its control of the concentration of impurities (components affecting the product) to the same level as standard blast furnace methods (phosphorus 150 ppm, nitrogen 40 ppm or less), toward the goal of manufacturing high-grade steel suitable for car body panels and other parts with the directly reduced iron made from low-grade iron ore. JFE Steel is in charge of evaluating and examining the new heat sources and scrap iron preheating using a small-scale test electric furnace with a capacity of 10 tonnes and developing technologies for dephosphorization and denitrification of molten steel using an ex-core refining furnace with a capacity of 3 tonnes.

- ▶ Project scale: Approx. 40.4 billion yen*¹, Financial support scale: Approx. 30.6 billion yen*² (total for the four companies)

*1 The project scale is calculated based on the level of financial support and the subsidy rate.

*2 This includes incentives subject to change depending on project progress and other factors at each stage gate.

- ▶ [NEDO: A new research focus under the Green Innovation Project: Hydrogen Utilization in Iron and Steelmaking Processes \(Japanese only\)](https://www.nedo.go.jp/news/press/AA5_101738.html) (https://www.nedo.go.jp/news/press/AA5_101738.html)

- ▶ [NEDO: Hydrogen Utilization in Iron and Steelmaking Processes](https://green-innovation.nedo.go.jp/en/project/utilization-hydrogen-steelmaking/) (https://green-innovation.nedo.go.jp/en/project/utilization-hydrogen-steelmaking/)

- ▶ [Consortium of the Green Innovation Fund Project: Utilizing Hydrogen in the Steelmaking Process](https://www.greins.jp/en/) (https://www.greins.jp/en/)

Carbon Neutrality in the Material Cycles and Waste Management Sector

The Ministry of the Environment's "Draft Medium- and Long-term Scenarios for Net Zero Greenhouse Gas Emissions in the Material Cycles and Waste Management Sector by 2050" estimates future GHG emission and waste volume based on multiple hypothetical scenarios. It describes that even if the 3Rs (reduce, reuse, recycle) combined with heat recovery are implemented to the maximum extent possible and waste treatment facilities are expanded and consolidated, a considerable volume of waste will still require thermal treatment (incineration and thermal pyrolysis), which indicates that effective treatment of food waste through methods such as methane fermentation will be necessary. It is also expected that waste will become increasingly dominated by biomass as the 3Rs and material conversion are more strongly encouraged in response to the growing importance of resource recycling. The material cycles and waste management sector, which has traditionally relied on methods that release CO₂ into the atmosphere, such as incineration, need to reduce GHG emissions from its own sector and strive for carbon neutrality. Also, the waste treatment system must be reformed to become a major source of biomass-oriented carbon for the entire industrial sector. However, the constant fluctuation in the quantity and characteristics of waste materials (composition, calorific value, moisture content, and so forth) depending on the region, season, and weather, impedes the recovery and stable, efficient use of carbon, which increases the challenge of applying technologies such as carbon capture in other sectors. To address these issues and facilitate widespread implementation, JFE Engineering and Sekisui Chemical Co., Ltd. are jointly working on a project to develop waste-to-chemical

technology for Green Ethanol production by integrating advanced gasification and biochemical conversion technologies .

▶ Project scale: Approx. 34.7 billion yen*, Financial support scale: Approx. 23.7 billion yen (total for the two companies)

*This includes incentives subject to change depending on project progress and other factors at each stage gate.

▶ [NEDO: Achieving Carbon Neutrality in Waste and Resource Circulation](#)

(<https://green-innovation.nedo.go.jp/en/project/waste-resource-circulation-carbon-neutral/>)

▶ [NEDO: Achieving Carbon Neutrality in Waste and Resource Circulation \(Japanese only\)](#)

(https://www.nedo.go.jp/news/press/AA5_101724.html)

Efforts to Lower the Cost of Offshore Wind Power Generation

The offshore wind power generation market is expected to expand rapidly in the coming years. Capturing this market will require establishing a technology for mass-producing floating offshore wind power generation facilities at a low cost. The Ministry of Economy, Trade and Industry and NEDO have therefore decided to implement a floating offshore wind power generation demonstration project as a Green Innovation Fund project, toward commercializing floating offshore wind power generation. The project is intended to develop and demonstrate the necessary elemental technologies and the integration designs for a floating offshore wind power generation system. The project will receive financial support of about 85 billion yen* from NEDO and is scheduled to run from FY2024 to FY2030. JFE Engineering and Japan Marine United Corporation are participating in the project while working to lower the cost for offshore wind power generation.

*This includes incentives subject to change depending on project progress and other aspects at each stage gate.

▶ [METI: Offshore Wind Power Generation Demonstration Project \(Japanese only\)](#)

(<https://www.meti.go.jp/press/2024/06/20240611007/20240611007.html>)

▶ [NEDO: Floating Offshore Wind Power Generation Demonstration Project \(Japanese only\)](#)

(https://www.nedo.go.jp/news/press/AA5_101750.html)

▶ [NEDO: Cost Reductions for Offshore Wind Power Generation](#)

(<https://green-innovation.nedo.go.jp/en/project/offshore-wind-power-generation/>)

Participation in the GX League

The Ministry of Economy, Trade and Industry has established the GX League, a forum that invites companies to work on GX; take up the challenge of GX in cooperation with the government, academic, and economic sectors; discuss how to transform the overall economic and social system; and drive the creation of new markets. We believe that its goal is aligned with the JFE Group's overall objective for climate change initiatives, and JFE Steel has been participating in the GX League since its establishment.

As part of its activities within the GX League, JFE Steel has been proactively participating since March 2023 in the Working Group for Studying How to Add Value to Green Products, and in December 2023, the WG published a document entitled "How to Add Value to Green Products." The document recognizes that companies wanting to invest more in decarbonization need to see the value in the level of emissions reduced through their initiatives and that this value also needs to be recognized in the global market. It presents draft guidelines on how to add value to green products and outlines some example initiatives, including JFE Steel's JGreeX™. It also introduces measurement and calculation methods for the green value of products, effective allocation, and economic utilization methods.

In addition, based on the ideas presented in the document, the Interim Report of the Study Group on the GX Product Market which Contributes to Demand Creation for Strengthening Industrial Competitiveness and Achieving Emission Reductions, published by the Ministry of Economy, Trade and Industry in March 2024, suggested "reduction achieved" as a new GX value.

▶ [Final Report for the GX League \(Japanese only\)](#) (<https://gx-league.go.jp/action/wg/>)

▶ [Document regarding how to Add Value to Green Products \(full version, in Japanese only\)](#)

▶ [Document regarding how to Add Value to Green Products \(summary version, in Japanese only\)](#)

Investment in the GX Acceleration Agency

The GX Acceleration Agency is a certified corporation established in April 2024 by the Ministry of Economy, Trade and Industry, as stipulated in the Act on Promoting a Smooth Transition to a Decarbonized Growth-oriented Economic Structure. In order to achieve GX investment of over 150 trillion yen over the next 10 years, the GX Acceleration Agency will provide financial support as debt guarantees, operate a carbon emissions trading system, and collect fossil fuel surcharges. JFE Holdings invested in the GX Acceleration Agency at the time of its establishment.

► [GX Acceleration Agency](https://www.gxa.go.jp/en/) (https://www.gxa.go.jp/en/)

Recommendations to Policymakers

8th GX Implementation Council

In February 2023, the cabinet approved the Basic Policy for the Realization of GX to simultaneously achieve three goals through Green Transformation (GX): decarbonization, stable energy supply, and economic growth. In July of the same year, the cabinet also approved the Strategy for Promoting Structural Transition based on Decarbonization (GX Promotion Strategy). Growth-oriented Carbon Pricing (CP) Concepts is the decarbonization initiative based on this strategy and is currently being actively pursued toward its realization and implementation.

At the 8th GX Implementation Council, held in November 2023, JFE Steel's President Kitano (then-Chairman of the Japan Iron and Steel Federation) explained the efforts being made by the Japanese steel industry to achieve carbon neutrality, and he called for long-term government support measures corresponding to the support provided by the government in Europe, the U.S., and China for the huge research and development and capital investment costs. He also expressed the need for long-term government support for converting to innovative processes and dealing with the increase in operational costs for non-fossil fuels, electricity, and other sources, as actions for stimulating demand for green steel materials with high environmental value through, for example, public procurement, measures to ensure the international competitiveness of industrial electricity prices, and support for building new infrastructures, including a hydrogen supply chain and a CCS scheme.

► [Cabinet Secretariat: the 8th GX Implementation Council \(Japanese only\)](https://www.cas.go.jp/jp/seisaku/gx_jikkou_kaigi/dai8/index.html)

(https://www.cas.go.jp/jp/seisaku/gx_jikkou_kaigi/dai8/index.html)

56th Meeting of the Advisory Committee for Natural Resources and Energy's Strategic Policy Subcommittee

The 56th Meeting of the Advisory Committee for Natural Resources and Energy's Strategic Policy Subcommittee was held on June 6, 2024 to embark on formulating Japan's 7th Strategic Energy Plan. At this meeting, JFE Holdings' President Kitano gave a presentation entitled Energy Policy to Help JFE Steel Achieve Decarbonization, during which he recommended policies to promote the use of green steel products and energy policies to reduce uncertainty from the business environment related to GX. President Kitano announced that the company plans to invest in converting to the innovative electric arc furnace process at the Kurashiki district by the end of this fiscal year, based on the premise of government support, and he explained that the company also intends to build a mass production system for high-quality green steel products that could not be manufactured with existing electric furnaces. In addition, he stated that actions are required to support capital investment and operational costs as well as policies promoting the use of green steel products for Japan to compete internationally in green products. He also discussed the need to establish infrastructures for supplying decarbonized electricity and non-fossil fuels such as hydrogen and ammonia, and remarked that the government must take a leading role as the policymaker and promote DX as a national strategy, to use decarbonization as an opportunity to revive the Japanese economy.

► [Agency for Natural Resources and Energy: 56th Meeting of the Advisory Committee for Natural Resources and Energy's Strategic Policy Subcommittee \(Japanese only\)](https://www.enecho.meti.go.jp/committee/council/basic_policy_subcommittee/2024/056/)

(https://www.enecho.meti.go.jp/committee/council/basic_policy_subcommittee/2024/056/)

Participation in External Initiatives & Lectures

TCFD Consortium

The TCFD Consortium was established as a forum for companies that support the TCFD recommendations to collaborate in promoting its initiatives and continue discussions on effective disclosure of corporate information and ways for financial institutions to utilize the disclosed information to make appropriate investment decisions. JFE Holdings supports the recommendations of the final TCFD report and also participates in this consortium.

SPEED Research Group

The SPEED (Special Project on Eco-innovation and Eco-business for Sustainable Development) Research Group contributes to the development of eco-innovations and eco-businesses through industry-academia-government collaboration and international cooperation. JFE Holdings participates in this research group and is involved in activities such as information sharing and opinion exchange with government, universities, research institutions, and companies.

JFE Engineering

Japan Climate Leaders' Partnership (JCLP)

JFE Engineering is a member of the Japan Climate Leaders' Partnership (JCLP). Established in 2009, the JCLP is a coalition of Japanese corporations that encourage the industrial community to fully recognize the urgency of climate change and take more decisive action to create a sustainable, decarbonized society. Companies fulfill their corporate responsibility by demonstrating leadership in the transition to a decarbonized society. The Company is participating in the Decarbonization Consortium, JCLP's platform for encouraging information sharing and collaboration between companies and is actively engaged in creating opportunities to learn from companies at the frontline of decarbonization efforts, and collaborating with other companies to create new solutions.

JFE Shoji

United Nations Global Compact

In 2021, JFE Shoji became a signatory to the United Nations Global Compact, affirming its support for these principles. JFE Shoji will comply with the Ten Principles of the Global Compact and endeavor to achieve the SDGs. In addition, we are also a member of the Global Compact Network Japan, the local network of the Global Compact. The company has designated "Contribute to resolving climate change issues" as a material issue of corporate management. We are using the decarbonization initiatives of other participating companies as references for driving our own initiatives to reduce CO₂ emissions in the JFE Group and society as a whole.

Lectures and Publications

The JFE Group gives talks at various events to increase awareness of our efforts to combat climate change.

- Lecture: "JFE Steel's Initiatives for Achieving Carbon Neutrality and the Challenges" at the Joint General Meeting of Okayama Employers' Association & Okayama Music Culture Association (main host: Okayama Employers' Association)
 Date: June 26, 2024
 Lecturer: Hiroyuki Tezuka (Fellow, JFE Steel Corporation)

- Article: "Chain of custody approaches in the steel sector and the role of GHG reduction certificates"
 Published on the website of the World Steel Association (Climate Action > Chain of Custody)
 Date of publication: April 8, 2024
 URL: <https://worldsteel.org/climate-action/chain-of-custody/>

- Lecture: "JFE Steel's Initiatives for Achieving Carbon Neutrality and the Challenges" at the Workshop for Students Tackling the Climate Change Issues (main host: the Executive Committee of the Workshop for Students Tackling the Climate Change Issues (chaired by Yukari Takamura, professor at the Institute for Future Initiatives, The University of Tokyo), co-hosts: the Ministry of the Environment, the University of Tokyo, the Tokyo Institute of Technology, Kyushu University, Keio University, and others)
 Date: March 13, 2024
 Lecturer: Hiroyuki Tezuka (Fellow, JFE Steel Corporation)

- Roundtable session: "IRA and GX Strategy: U.S.-Japan Partnership for a Net-Zero World"
 Main hosts: U.S. Embassy in Tokyo, U.S.-Japan Council, and the Institute of Energy Economics, Japan
 Date: March 3, 2024
 Lecturer: Hiroyuki Tezuka (Fellow, JFE Steel Corporation)

- Lecture: "JFE Steel Carbon Neutral Strategy Briefing—JFE's Approach for Green Steel at Low-Carbon Transition for the Built Environment" (hosts: IES/IstructE Joint Committee, NUS (National University of Singapore))
 Date: March 1, 2024
 Lecturer: Hiroyuki Tezuka (Fellow, JFE Steel Corporation)

- Lecture: "JFE Group's Carbon Neutral Strategy" at TECH+ Forum Manufacturing and Decarbonization Day 2024 Feb. (host: TECH+ Seminar Office of Mynavi Corporation)
 Date: February 15, 2024
 Lecturer: Seiya Kitajima (Senior Executive Officer, JFE Holdings, Inc.)

- Lecture: "JFE Group's Carbon Neutral Strategy" during the 16785th JPI Special Seminar (host: Japan Planning Institute)
 Date: February 14, 2024
 Lecturer: Seiya Kitajima (Senior Executive Officer, JFE Holdings, Inc.)

- Lecture: "JFE Group's Carbon Neutral Strategy" at the Carbon-Neutrality in Materials Industry Forum (host: Yano Research Institute Ltd.)
 Date: December 19, 2023
 Lecturer: Ikufumi Sumi (Leader, Global Environment Team, Green Transformation Strategy Dept., JFE Steel Corporation)

- Lecture: "JFE Group's Carbon Neutral Strategy" at the 2nd Support Seminar for Green Growth (host: Okayama Prefecture Industrial Promotion Foundation (public interest incorporated foundation))
 Date: December 19, 2023
 Lecturer: Noriaki Sueto (Business Planning Dept. Manager, JFE Holdings, Inc.)

- Lecture: “Latest Technology in Energy and Environment in the Steel Industry and Measures against Global Warming” in the Tokyo Institute of Technology's Advanced Course in Science and Technology—Advanced Science and Technology in Energy and Environment
 Date: December 13, 2023
 Lecturer: Ikufumi Sumi (Leader, Global Environment Group, Technology Planning Dept., JFE Steel Corporation)
- Lecture: Final report of the GX League's Working Group for Considering Added Value to Green Products
 Release date: December 4, 2023
 Publisher: Ministry of Economy, Trade and Industry
 URL: <https://gx-league.go.jp/news/2023120401/> (Japanese only)
- Lecture: Guidelines for green steel upon the application of the mass balance approach, published under “Initiatives in the Steel Industry Green Steel” on the Japan Iron and Steel Federation's website
 Date of publication: October 26, 2023
 URL: https://www.jisf.or.jp/business/ondanka/kouken/greensteel/documents/2023_greensteel_guideline.pdf
- Lecture title: “JFE Group Environmental Vision for 2050—JFE's Approach for Green Steel”
 Event: GGX×TCFD Summit
 Date: October 5, 2023
 Lecturer: Hiroyuki Tezuka (Fellow, JFE Steel Corporation)
- Articles: “Carbon neutrality of Steel, the Fundamental Material—Full-Scale Transition to New Manufacturing Processes” (published in the September issue) and “Japan's First Monopile Manufacturing for Offshore Wind Power Generation by Maximizing Group Synergy” (published in the November issue)
 Produced through an interview by Masako Konishi (WWF Japan) for the “paint a future” section of the bimonthly magazine Chikyū Ondanka, published by Nippo Co., Ltd.)
 URLs: https://www.wwf.or.jp/activities/data/20230929_climate01.pdf (September issue)
<https://www.wwf.or.jp/activities/data/20231125climate01.pdf> (November issue)
- Article: “LCA of Steel Materials and Initiatives for CO₂ Reduction” in the Journal of Chemical Engineering of Japan, June 2024, volume 088
 Author: Shiro Watakabe (Global Environment team, Green Transformation Planning Dept., JFE Steel Corporation)

Global Scale Initiatives

Global Actions to Address Global Warming

ISO 14404 is an international standard proposed by The Japan Iron and Steel Federation (JISF) to the International Organization for Standardization (ISO) as a methodology for the globally unified calculation of CO₂ intensity from iron and steel production, ultimately to assess the energy efficiency of steelworks. The Japanese steel industry is addressing global warming through international public-private collaborations, including ISO 14404-based assessment of steelworks in developing countries and recommending specific technologies best suited to India and ASEAN countries. It is continuing this effort together with the Ministry of Economy, Trade and Industry (METI) in order to enhance ISO 14404 so it can be applied to steel manufacturing facilities with more complex structures.

JFE Steel is also addressing global warming by participating in international activities, such as the Japan India Public and Private Collaborative Meeting, the Japan-ASEAN Steel Initiative and the Japan-China Steel Industries Exchange. In addition, JFE Steel is involved as a member of World Steel Association (WSA)'s Climate Action data collection programme, which uses ISO 14404 as the standard for measurement and calculation.

► [WSA: Climate Action data collection programme](https://worldsteel.org/steel-topics/environment-and-climate-change/climate-action/climate-action-data-collection/data-providers/)

(<https://worldsteel.org/steel-topics/environment-and-climate-change/climate-action/climate-action-data-collection/data-providers/>)

■ WSA Climate Action data collection programme certification



WSA Climate Action Data Collection Programme—Contributing to Developing the LCA of Steel Material

Accurately evaluating the environmental impact of products requires assessment and quantification of impact over their entire life cycles, from raw resource mining to material production, product manufacture, use, and final disposal. Life cycle assessment (LCA) is one evaluation method.

After final products such as automobiles and buildings finish their mission in society, all of their steel components can be recycled and reused. This closed loop recycling ability is an excellent characteristic of steel materials. Taking this into account through LCA reveals that steel can be viewed as having extremely low environmental impact compared to other materials.

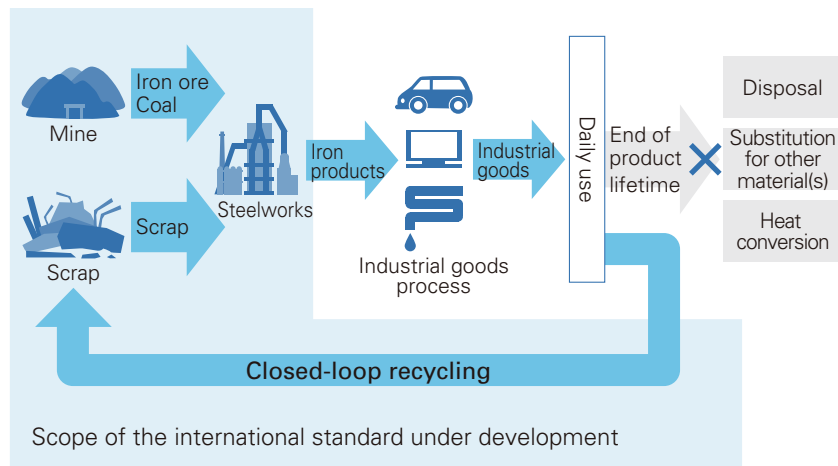
JFE Steel played a major role in the development of ISO 20915 (Life Cycle Inventory Calculation Methodology for Steel Products) and JIS Q 20915 (Life Cycle Inventory Calculation Methodology for Steel Products), initiatives led by The Japan Iron and Steel Federation (JISF), which takes into account the impact of recycling and provides life cycle inventory (LCI) calculation methods specific to steel products.

In addition, 15 Japanese manufacturers of blast furnaces and electric arc furnaces joined forces to calculate the Japanese average for LCI of different steel products. Calculations based on their FY2018 operational data were also published.

JFE Steel acquired SuMPO EPD labels, the Japan Environmental Product Declaration program run by the Sustainable Management Promotion Organization (SuMPO), for three steel sheet products for cans (tinplate, laminated steel sheet JFE Universal Brite, and tin-free steel), five building material products (H-beams, JFE Super HISLEND-H beams, extra-thick H beams, construction steel plates, and construction steel columns), three steel plate products (for offshore structures and wind power equipment, ship building, and UOE steel pipes), three steel pipes (welded steel pipe, seamless steel pipe, and Kakuhot™ seamless square steel pipe for building structures), and eight types of steel bar and wire rod products manufactured at the West Japan Works (Kurashiki district) and Sendai Works. We will continue to leverage SuMPO EPD labels to help customers promote environmental protection and to strengthen communications with them.

► Value of Steel (P.04)

Life Cycle of Steel Materials



Global Actions to Address Global Warming

1st Japan-Korea Green Steel Joint seminar

The 1st Japan-Korea Green Steel Joint Seminar was held in Seoul, South Korea, on Thursday September 21, 2023, jointly organized by the Japan Iron and Steel Federation and the Korea Iron and Steel Association. The seminar was attended by representatives from both countries, including Masaaki Izumiyama, Chairman of the Global Environment Committee of the Japan Iron and Steel Federation (Nippon Steel Corporation), and Byun Young-man, Vice Chairman of the Korea Iron and Steel Association, as well as guests of honor, including Daisuke Matsuno, Director of the Metals Division of the Ministry of Economy, Trade and Industry of Japan, and Oh Choong-jong, Director of the Metals and Ceramics Division of the Ministry of Trade, Industry and Energy of the Republic of Korea. Around 100 people from the steel industry and government organizations from both Japan and South Korea attended the seminar and exchanged opinions on wide-ranging topics related to carbon neutrality in the steel industry.

Japan India Public and Private Collaborative Meeting

The Japan Iron and Steel Federation has held the Japan-India Steel Industry Public-Private Collaborative Meeting annually since 2011 with support from the Ministry of Economy, Trade and Industry, and JFE Steel attends this meeting every year. At the meeting, we recommend policies to the Indian steel industry, drawing on the technology and experience of Japan's steel industry, which boasts the world's highest energy efficiency, and we also consider energy-saving support from Japan, including financial support.

The FY2023 meeting was held in Japan in November and introduced policies for achieving carbon neutrality in both Japan and India, initiatives by Japanese and Indian steel companies to achieve carbon neutrality, and efforts by the Japanese steel industry during the transition period, including green steel brands. JFE Steel will continue to play a major role in this meeting and contribute to CO₂ reduction in India by transferring Japanese energy-saving technologies.

Japan-ASEAN Steel Initiative

In May 2014, the Japan Iron and Steel Federation and the ASEAN Iron and Steel Council (AISC) signed a memorandum of understanding to promote regional collaboration the areas of the environment, standardization, and trade. The Japan-ASEAN Steel Initiative was launched as a public-private environmental effort to strengthen cooperation in environmental and energy-saving efforts in ASEAN countries. As part of its activities, the initiative developed a Technologies Customized List (electric arc furnaces) as well as a Technologies Customized List (blast furnaces), which include energy-saving, environmental protection, and recycling technologies for electric arc furnaces and blast furnaces suitable for the ASEAN steel industry.

This year, the ASEAN JAPAN Steel Initiative Webinar 2024 was held in February 2024. Representative organizations from ASEAN included ACE (ASEAN Centre for Energy), SEAISI (South East Asia Iron and Steel Institute), ministries and agencies related to steel and energy conservation in each country, as well as steel organizations and their members, while participants from Japan included the Ministry of Economy, Trade and Industry, the Energy Conservation Centre, the Japan Iron and Steel Federation, and members of these organizations. The meeting discussed initiatives for carbon neutrality in the steel industry in Japan and ASEAN countries, including the GX League, projects in emerging countries that contribute to energy efficiency, Japanese steel manufacturer roadmaps to carbon neutrality and energy-saving operational improvements, energy-saving technologies of engineering companies, and initiatives for carbon neutrality by Thai and Indonesian companies.

Japan-China Steel Industry Environmental Protection and Energy Conservation Technology Conference

This conference has been held since 2005, based on the memorandum of understanding that was signed at the Japan-China Steel Industry Environmental Protection and Energy Conservation Technology Conference, held in Beijing in July 2005 with the participation of top executives from both countries' steel industries. The purpose of the conference is to raise the level of environmental conservation and energy saving in both countries through information exchanges between technical experts from steel manufacturers in Japan and China. The importance of this conference has been growing as it helps to promote not only sound development of the steel industry in both countries but also the effective use of resources and environmental conservation.

The FY2023 event was held in Makuhari, Chiba City, in January 2024. Both countries shared innovative technology

developments for carbon neutrality, the Carbon Border Adjustment Mechanism (CBAM), the Green Steel/EPD Platform, and the latest energy-saving and CO₂ reduction technologies. JFE Steel's Vice President Hironori Fukushima (Chairman of the Japan Iron and Steel Federation's Environment and Energy Policy Committee) attended the meeting to represent Japan, along with JFE Steel's senior Executive Officer Takeshi Asahina and Fellow Hiroyuki Tezuka. They led lively discussions on preventing global warming through cooperation between the public and private sectors of both countries.

Lecture Events

The JFE Group provides lectures at various events to raise awareness overseas of our efforts to address climate change.

- Lecture: "Green steel with applying mass balance method" at the Korea-Japan Green Steel Joint Seminar
 Date: September 21, 2023
 Lecturer: Hiroyuki Tezuka (Fellow, JFE Steel Corporation)

- Lecture: "JFE Steel's Environmental Vision 2050" during the India-Japan Public and Private Collaborative Meeting on the Iron and Steel Industry in FY2023
 Date: November 29, 2023
 Lecturer: Shiro Watakabe (Global Environment Team, Green Transformation Planning Dept., JFE Steel Corporation)

- Lecture: "Transition Finance and Green Steel upon the Application of the mass Balance Approach" at the 14th Japan-China Steel Industry Environmental Protection and Energy Conservation Technology Conference
 Date: January 24, 2024
 Lecturer: Hiroyuki Tezuka (Fellow, JFE Steel Corporation)

- Lecture: "JFE Steel's Environmental Vision 2050" during the ASEAN Japan Steel Initiative (AJSI) Webinar
 Date: February 6, 2024
 Lecturer: Shiro Watakabe (Global Environment team, Green Transformation Planning Dept., JFE Steel Corporation)