



News Release

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Nippon Steel Corporation

Start of Studies to Shift from Blast Furnace Steelmaking Process to Electric Arc Furnace Steelmaking Process

Nippon Steel Corporation (“Nippon Steel”) has decided to start studies to shift from the blast furnace (BF) steelmaking process to the electric arc furnace (“EAF”) steelmaking process by using the Kyushu Works Yawata Area and the Setouchi Works Hirohata Area as candidate sites.

In its “Nippon Steel Carbon Neutral Vision 2050” announced in March 2021, Nippon Steel aims to achieve carbon neutrality by developing three breakthrough technologies: hydrogen injection into BFs; hydrogen direct reduction of iron; and high-grade steel production in large-sized EAFs.

As for hydrogen injection into BFs, we began blowing high-temperature hydrogen into a test BF (12m³) at the East Nippon Works Kimitsu Area in May 2022. In the same area, we will begin demonstration using an actual large BF (4,500m³) in operation in January 2026.

For the production of hydrogen direct reduced iron, a small shaft furnace will be installed at the Hasaki R&D Center (Kamisu City, Ibaraki Prefecture) of the R&D Laboratories, and tests to reduce low-grade iron ore using hydrogen will begin in fiscal 2025.

As for the production of high-grade steel in large EAFs, commercial operation of the new electric furnace in the Setouchi Works Hirohata Area began in October 2022, enabling the world’s first integrated EAF to produce and supply high-grade electrical steel sheets. In addition, a small EAF (10 tons) will be installed at the Hasaki R&D Center, and tests will begin in fiscal 2024.

In line with the Japanese Government’s Basic Policy for the Realization of Green Transformation (GX), Nippon Steel is committed to contributing to the economic growth of Japan and ensuring the international competitiveness of its industries by continuing to provide a stable supply of steel products and quickly implementing the output of its R&D activities in Japan without lagging behind other countries. Specifically, we will advance the development and commercialization of the three breakthrough technologies toward achieving carbon neutrality by 2050. In order to achieve our 2030 decarbonization target and contribute to the government’s target of a 46% reduction in greenhouse gas emissions, we believe that we need to shift certain steelworks from the BF steelmaking process to the EAF steelmaking process as soon as possible. We have therefore decided to start studies by using the Kyushu Works Yawata Area and the Setouchi Works Hirohata Area as candidate sites.

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As we begin studies to shift the steelmaking process, we will establish an in-house study organization and accelerate studies by inviting a wide range of external parties, so as to achieve the objective at the earliest possible time. The two candidate sites for the EAF shift are Nippon Steel's representative mass production bases for high-grade steel. Both areas intend to bring together the outcomes of the technologies under development and to become quickly engaged in making carbon neutral high-grade steel.

To shift from the BF process to the EAF process is expected to have a significant effect in reducing CO₂ emissions but a significant increase in production costs is also expected due to the requirement for huge capital expenditures and an increase in operational costs, including raw materials and electricity costs.

In order to make economically viable business decisions regarding such large-scale investments with the sole purpose of reducing CO₂ emissions that contribute to global environmental challenges, there are issues such as policy support for capital investment and increased production costs, and the evaluation of the market value of carbon-neutral steel products, for which supply will be gradually expanded toward 2050. We cannot foresee all of these issues at this stage but we need to further enhance the predictability of investment decisions going forward.

We will continue efforts to strongly urge the government to swiftly develop policy support measures that are currently under consideration, and to promote public understanding of carbon-neutral steel products.

End

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