

Nippon Steel's Green Transformation (GX) Initiatives

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Summary of Q&A*

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Q Could you elaborate your Scrap, DRI/ HBI strategies including HBI import opportunities?

A In terms of cost reduction, we are primarily considering the use of scrap sourced in Japan. However, we may also use HBI if required.

Q Could you further elaborate on why you plan to replace power production plants by CCGT-installations and power procurement - rather than signing sizeable renewable energy PPA's or developing wind- and solar production capacity? Since this would further reduce transition risks / GHG emissions, lowers risks tied to volatile energy prices, and based on quick-assessment would likely have a more attractive business case.

A A continuous and stable power supply available 24/7 is essential for steelworks. Renewable energy generation fluctuates significantly, making it difficult to provide a continuous and stable power supply. For this reason, we are initially examining a transition to GTCC. In the longer term, however, we aim to shift from fossil fuels to hydrogen or ammonia.

Q What efforts is NSC making to improve alignment of emissions accounting methodologies for GX Steel with international standards like GHG Protocol and SBTi in order to enable more private sector demand? Experts and demand-side sectors generally indicate more transparent, robust approaches are required.

A We are sharing our views with those involved in discussions on the GHG Protocol and SBTi and also presenting various proposals at their conferences. We believe that Japan's efforts to standardize approaches to GHG reduction projects are among the most advanced and practical in the world. We also believe that discussions on international standards should likewise be grounded in such realistic approaches.

Q There are a number of technical challenges to hydrogen usage: 1. hydrogen reduction is endothermic so it cools the process, how is Nippon Steel overcoming this?

A The endothermic reaction lowers the temperature inside the furnace. To compensate for this heat loss, we are considering an approach that heats hydrogen. We are currently verifying its effectiveness.

Q What developments is NSC seeing in demand for low-emissions steel from downstream sectors such as automotive and construction, and what conditions are most important to accelerate stronger long-term demand signals?

Any works on lowering green steel prices, what are sentiments from demand-side sectors on procuring green steel? How does Nippon Steel work with demand side companies to drive green steel demand?

A The demand for GX steel is gradually increasing. For example, since the introduction of support measures under the CEV subsidy program, we have seen a growing number of repeat inquiries from automakers. As part of our standardization efforts, we are engaged in ongoing discussions with the real estate industry regarding the LCA of building structures. In cooperation with the real estate industry, we are urging the MLIT to incorporate the value attributed to GX steel under the mass-balance approach into building LCAs. Similarly, discussions are underway on international standards of automotive LCAs, with plans to adopt a chain-of-custody approach. In the steel industry, we have been working with the automotive industry on this issue.

*Based on information as of the date of the briefing unless specified otherwise

In addition, conducting LCAs for automobiles and buildings requires data linkage. Discussions have already begun at METI meetings on how the relevant industries can work together to enable such data linkage.

Various industries are working together to discuss standardization and data linkage. Through these activities, we have become increasingly aware of the growing interest in GX steel.

However, to establish a market for three million tons of steel in practice, we believe that a rules-based framework covering the entire value chain is essential. We will not only urge the government to introduce specific measures to address these issues, but also seek to build understanding and raise awareness among the relevant industries.

Q Your decarbonization journey is also dependent on factors outside your control, including technological advancements and public policy. Regarding the latter, how does Nippon Steel support domestic and international efforts to mitigate climate change in terms of lobbying activities?

A We have diligently presented our proposals on various policy issues to the relevant government agencies and the government. On a daily basis, we conduct lobbying activities not only with individual government agencies but also across multiple agencies, encouraging interagency coordination on our proposals. We believe these lobbying activities are yielding results. For example, we believe these efforts have contributed to policy decisions related to the use of GX steel in public works. The annex outlines our publicly disclosed lobbying activities and their outcomes. However, in addition to the activities described there, we conduct face-to-face lobbying on a daily basis, spending many times more hours on such activities than are reflected in the annex.

Q What will be your major hurdle to achieve your goal on carbon neutrality?

A From a market perspective, a major challenge is how to build broader social understanding of sharing the associated costs across the entire value chain. Another challenge is how to establish the use of GX steel as a social norm. Your cooperation is therefore essential. Above all, we would like to see greater international discussions of this issue.

In addition, the mass-balance approach is necessary not only for the steel industry but also for customers. As discussions on data linkage have made clear, we need to establish a process through which we provide the value of CO₂ reductions, and customers aggregate that value and allocate it across various products. Through this process, we can establish a GX value chain. Discussions are also underway on advanced issues such as the GHG Protocol, market approach based on the SBTi, and chain of custody. We believe this indicates that practical discussions aimed at achieving genuine carbon neutrality have finally begun.

From a technological perspective, the key point is to make effective use of steel scrap accumulated through the production of steel by reducing iron ore. However, global steel consumption continues to increase, making it necessary to continue reducing iron ore as well. Coal has traditionally been used to reduce iron ore because it is the most economical and practical option. However, because the use of coal results in CO₂ emissions, it must be replaced by something else. Although hydrogen can technically be used, the most significant problem is that water must first be split when it is used as the source of hydrogen. Stable water splitting requires a large amount of energy, increasing costs, while the use of hydrogen to reduce iron ore also adds further costs. We are currently developing technology that uses hydrogen to reduce iron ore. Our next major challenge will be to develop technology that can produce large quantities of hydrogen at low cost. Furthermore, if using hydrogen imposes additional costs, the key question is whether those costs can be incorporated into the value of GX steel. However, as a steelmaker, our first priority is to establish the hydrogen reduction method.

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