

Nippon Steel's Green Transformation (GX) Initiatives

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Summary of Q&A¹

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Technology Development and Implementation

- Q The chart on slide 26 of today's presentation materials indicates that high-quality iron ore suitable for Direct Reduced Iron (DRI) production is rare, accounting for less than 10% of global iron ore supply. However, there are also data suggesting that the reserves could be 15-20%, and methods such as beneficiation of low-grade iron ore for DRI production could be considered. Therefore, it seems that resource constraints may not be an issue.
- A The bubbles shown on the chart on slide 26 represent production volume, which is different from reserve volume. Indeed, the recoverable reserves of high-grade iron ore might be larger than 10%, and there is also a possibility to expand the available ores for use through beneficiation. We are working on technology to solve the technical challenges associated with using low-grade iron ore for DRI production, and broadening its applicability is one of the key missions of our development efforts.
- Q I think the efforts towards the development of hydrogen direct reduction are excellent. How do you view the possibility of importing GX steel or green Hot Briquetted Iron (HBI) from countries with abundant renewable energy? Transporting ammonia and hydrogen is difficult and energy-intensive, so wouldn't it be more efficient to transport iron or HBI with embedded green hydrogen?
- A As you correctly pointed out, transporting solid materials like HBI is more efficient than transporting gases such as hydrogen and ammonia. Therefore, the locations for producing DRI using hydrogen are not limited to Japan but also include regions with ample hydrogen supply or abundant clean energy. Our policy is to advance the development of core

¹ Based on information as of the date of the briefing unless specified otherwise.

technologies in Japan, but it is important to carefully consider various options in the process of full-scale implementation.

Predictability of investment recovery

Q How much do you expect to spend on R&D, CAPEX, and OPEX over the next three years? I understand that it is difficult to quantify at this stage, but many investors would like to see more specific disclosures. Could you consider disclosing some numbers with assumptions whenever possible in the near future?

A It is difficult to accurately quantify the required investments, including R&D expenses, at this stage. This is because various technologies are still in the development phase, and the combination of these technologies, as well as their economic viability, have not yet been determined. The estimate stated on slide 55, which suggests that the CAPEX for the actual implementation equipment could exceed 4 to 5 trillion yen, is merely based on current price indices and other factors, and should be regarded as a rough estimate.

As our R&D progresses and the discussions surrounding the practical implementation phase advance, we will be able to make economically viable decisions for individual projects. At that point, we expect to be able to disclose these figures accordingly. However, it remains very difficult to provide a comprehensive estimate of the total investment amount at this time.

Creation of GX Steel Market

Q I understand that, due to the significant CAPEX and OPEX, a premium for GX steel is necessary. However, how do you expect the cost to increase over time, and what level of premium will be required? Also, what level of carbon price do you anticipate to be necessary to bridge the gap between GX steel and non-GX steel pricing?

A We cannot disclose specific figures regarding the increase in costs. What is crucial is not the cost itself but how we assess the value of CO₂ reductions. It is not the high cost that creates value, but rather the value derived from CO₂ reductions that should be the focus of our evaluation.

We are considering the value of CO₂ reductions through various approaches, taking into account insights from both domestic and international research institutes. There are primarily two approaches: one is based on estimating the economic losses resulting from climate-related damages, and the other is based on the social marginal cost required for

CO₂ reduction measures. In both approaches, the value of CO₂ reductions is estimated to exceed 200 dollars per ton of CO₂.

Q All stakeholders are required to align their efforts with the Paris Agreement. We evaluate not only the policy positions of individual companies but also those of the trade associations to which they belong. I would like to ask if you have any plans to disclose such information in the future.

A Our company's policy positions are outlined starting from slide 71 which can be referred to as a reference material.

Regarding trade associations, we are members of major economic organizations, including Keidanren (Japan Business Federation) and other representative economic bodies in Japan. These organizations have established committees focusing on decarbonization and energy-related issues, through which we make proposals to the government and society. We are deeply involved in these advocacy activities.

On slide 60 and slide 68 we have outlined our stance, the scope of activities, and the resulting outcomes for each policy issue. As an individual company, we invest significant time and human resources into these efforts, conducting advocacy activities almost daily with our counterparts on various issues. These activities have played a crucial role in achieving policy outcomes. However, disclosing the details of these daily activities is difficult, and we believe very few companies globally disclose such information. Instead, I encourage you to refer to slide 68, where we have summarized our public presentations, proposals, and expressions of interest made in public forums.

As for disclosing information on the advocacy activities of trade associations and economic groups, I would like to understand the motivation and underlying reasoning behind your interest in disclosure of such information. We invest substantial energy into our advocacy efforts, and we recognize that we have achieved positive results. While disclosure of these activities poses challenges, we hope that you can evaluate our efforts based on the outcomes we have achieved.

At the same time, we would like to better understand why the disclosure of industry groups' advocacy activities would be considered as a part of evaluation to our own efforts. If we are convinced, we will then consider whether we can provide the information as requested.

Q I would like to ask about your overall business strategy related to the mass balance method. While I understand that it has economic significance at the moment, I find it difficult to see it as a long-term solution.

A As shown on slide 51, the mass balance method is a necessary approach during the transition period. Once the shift from the current blast furnace method to one of the three breakthrough technologies introduced in the presentation is completed, the mass balance method will no longer play a role.

However, during the intermediate stages, or before the full conversion is complete, it will still be necessary to continue using the mass balance method. There are two main reasons for this: First, it is not possible to convert all blast furnaces to the new breakthrough technologies at once, so the transition must proceed gradually. Second, each steelworks supplies products tailored to the specific needs and quality requirements of customers. Since the customers verify their quality requirements after confirming the characteristics of the production process of the steelwork which supplies the products, it is difficult to switch steelworks from the current supplying one to another. In the meantime, our steelworks which converts to the breakthrough technologies may not be the steelworks which currently supplies steel products to customers who seek GX steel. So the timing and location of our GX conversion may not necessarily align with when and where customers require GX steel. During the transition period, we will use the mass balance method to supply GX steel and continue recovering our investments, bridging the gaps in timing between the transition and customer demand.

Target Setting

Q The Japanese government has announced the 'GX2040 Vision'. Are you planning to set new targets aligned with the government's GHG emissions reduction goals? If you were to adjust your reduction targets to match the government's, how would it impact your reduction plans?

A Our company established a carbon-neutral vision and set targets in 2021. However, the process surrounding the government's new target-setting, the development of the Strategic Energy Plan, and the ongoing discussions regarding the actions taken by the industrial sector are not necessarily the same as when we originally set our targets. Going forward, it will become clearer how this will affect the business community, the industrial sector, and

individual companies, and how each company will set its targets. As the government's new targets were just approved by the Cabinet, we believe that the details will become clearer through ongoing discussions in the near future. As for us, we will closely monitor these discussions within Japanese society and consider how we should respond accordingly. At the same time, we acknowledge that each company has its own management plan, and how to approach these issues is an individual company matter. We will continue to evaluate this moving forward. At this point, we are unable to provide more detailed information.

End

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