TransitionAsia
ACCELERATING EAST ASIAN CORPORATE CLIMATE ACTION

NIPPON STEEL AGM INFORMATION PACK

Greater Focus on Decarbonisation Needed: Time for Investor Action Ahead of AGM

May 2024

Over the course of the year since the last AGM, Nippon Steel has made limited progress on setting out a path to decarbonise its operations from our sustainability report analysis. As such, Nippon Steel is not on a clear path towards its net zero commitments and is highly exposed to ESG risks, in particular carbon-related pricing, both domestically and internationally. It is therefore promising to see investors taking action by filing climate-related shareholder proposals to secure much-needed climate commitments from Nippon Steel.

To assist investors ahead of Nippon Steel's annual general meeting (AGM), we have provided further background on these climate-related shareholder proposals and updated our flagship decarbonisation technology review and emission pathway analysis. The four areas in this information packet are outlined below:

- **Climate-related shareholder proposals**
- **Decarbonisation technology review**
- **Emissions pathway analysis**
- **Relevant climate announcements over the past year**

CLIMATE-RELATED SHAREHOLDER PROPOSALS

On June 21, 2024, a group of shareholders, Legal & General Investment Management (LGIM), the Australasian Centre for Corporate Responsibility (ACCR) and Corporate Action Japan (CAJ), announced the co-filing of a set of three shareholder proposals asking Nippon Steel Corporation to protect the long-term interests of shareholders by improving its decarbonisation strategy.

Proposal one

Proposal one, filed by CAJ and ACCR, calls for increased climate disclosure from Nippon Steel in three areas:

i. Short- and medium-term GHG emission reductions targets aligned to the goals of the Paris Agreement for scope 1, 2 and 3 emissions for all operations and affiliates.
ii. Transition plans including decarbonisation-related capex investment over the next 3 years and the relevant emission reduction impact.
iii. Progress updates on the above targets and plans.

Transition Asia's responses and recommendations on the above are as follows:

i. This calls for short- and medium-term GHG emission reductions targets, to complement long term emission targets. This would provide much needed clarity regarding the adequacy of Nippon Steel's current suite of decarbonisation efforts vis-a-vis its long term targets.

   This item also calls for the reduction targets for all scope 1, 2 and 3 emissions. Today, while Nippon Steel has set Scope 1 and 2 emission targets, it has not set scope 3 emission targets on its supply chain, including its activities related to coal and iron ore mining. Setting robust targets across the entire supply chain can help stakeholders gauge corporate aspirations and help corporations identify climate-related risk exposed areas of their operations.

   Lastly, this item calls for reduction targets for all operations and affiliates. Today, Nippon Steel's climate targets do not extend to all operations and affiliates, most notably the ArcelorMittal Nippon Steel Hazira Plant, which has been the target of greenwashing claims. Thus, Proposal one's call for reduction targets to cover affiliates will help to plug this loophole.

ii. This item calls for transition plans including decarbonisation-related capex investment. This is much needed. While Nippon Steel has established plans related to the types of technologies being used to reduce emissions, the proportion of technologies being used in the future is uncertain. The technology costs, in particular capex costs related to Nippon Steel's decarbonisation roadmaps, are also unclear. Providing a time-bound, forward-looking climate transition plan will clearly outline how Nippon Steel plans to pivot the assets and business model toward their emission reduction targets. Concurrently, the transition plan should provide a level of disclosure ensuring stakeholders can evaluate themselves on whether or not Nippon Steel will take the right steps to align its business operations with its climate targets.

iii. This last item calls for progress updates on the above targets and plans. Nippons Steel has so far only managed to reach its climate targets through decreasing steel production of its majority owned assets. Nippon Steel will soon need to decouple production and emissions to achieve its goals. Timely and regular updates on progress made toward reaching climate targets and in particular implementing plans will provide stakeholders with necessary information to the actions being taken to decarbonise the operation inline with targets.

Proposal two

Proposal two, filed by CAJ and ACCR, asks for remuneration to be linked to the company's GHG emission reduction targets.

As highlighted in the emission and technology analysis updates below in this document, Nippon Steel faces large gaps between its stated climate targets and its actions. Thus, linking remuneration with the company's reduction targets ensures that there are real incentives for management to meet the company's climate targets. Linking remuneration

with climate targets is recommended by the Task Force on Climate-related Financial Disclosures (TCFD), which Nippon Steel has stated that it supports. [1][2]

Linking remuneration with climate targets is also becoming commonplace globally. In the US, 76% of large publicly traded companies had adopted a ESG metric-based compensation policy in 2023, which is a trend that is also increasing in Japan. [3][4]

Proposal three

Proposal three, filed by LGIM and ACCR, asks for improved disclosure of climate-related lobbying activities.

This proposal is being brought to the table at a time when the global investor trend is pushing for this to be the new norm.[5] ClimateAction100+, an investor-led initiative on climate change, has called on climate lobbying as one of its top priority areas for its signatories to advocate for and support. [6]To this end, the Global Standard on Corporate Climate Lobbying, an organisation supported by many investor groups, provides a useful outline that Nippon Steel could utilise. Other companies including leading food company Danone have used the outline to attract investor plaudits.[7][8][9] Thus, Proposal three's call for increased disclosure of its climate lobbying is an important step for Nippon Steel should heed to provide investors with confidence regarding its commitment to global and industry decarbonisation.

DECARBONISATION TECHNOLOGY SUMMARY

Nippon Steel targets reducing total CO_2 emissions by 30% by 2030 (from a 2013 baseline) and achieving carbon neutrality in 2050, which is in line with Japan's national net zero target. According to the company, it plans to achieve these emission reductions by focusing on three technology areas:[10]

a. COURSE50[11] - Reduction with hydrogen in blast furnaces (BFs) + Carbon Capture & Storage (CCS)
b. Hydrogen direct reduction of iron (H_2-DRI)
c. Electric Arc Furnaces (EAFs)

Unfortunately, despite announcements of these three decarbonisation focus areas, Nippon Steel has made limited real progress in decarbonising its operations.

COURSE50

Course50 is Japan's flagship decarbonisation technology for the iron and steel sector, utilising hydrogen and CCS for a planned total emission reduction from the iron making process of 30%. Nippon Steel's progress with the technology thus far has included reduction with hydrogen in blast furnaces in only a laboratory setting environment of 12 m^3 (far from commercial scale size of >4000m^3). In addition, Nippon Steel has made no commitment to ensure that green hydrogen (hydrogen derived from renewable electricity

power electrolysis) will be used, and instead, Course50 is expected to use coke oven-derived hydrogen.

Second, the viability of CCS in the steel sector to materially reduce emissions is unproven and highly questionable. Nippon Steel has no CCS projects at commercial scale in the pipeline and to date, the steel sector accounts for less than 1% of the total global pipeline of CCS projects. This is indicative of the technical and logistical challenges of using CCS to capture multiple stack and fugitive emissions at steel mills.

H_2-DRI

Nippon Steel's H_2-DRI initiatives are at a nascent and experimental stage with the sole exception of a yet to be operational small scale, experimental H_2-DRI plant at Nippon Steel's Hasaki R&D Center. Nippon Steel has no H2-DRI steel plants planned or operating at commercial scale.[12] This is in stark contrast to significant progress made on large and commercially-scaled H_2-DRI projects by other steel companies in China and Europe.

Secondly, H_2-DRI requires a reliable supply of green hydrogen that does not exist in Japan. Energy constraints in Japan and high domestic costs associated with green hydrogen production are in contrast to other countries such as China that have better renewable energy resources and benefit from low cost electrolysers. Thus, in Nippon Steel's quest to reduce emissions profitably, it would be more cost and energy-efficient to import hydrogen reduced hot briquetted iron (H_2-HBI) from other countries with better renewable electricity resources and access to DR-grade iron ores. [13] [14]

EAFs

Nippon Steel's repeated claims of EAF challenges are notwithstanding. It is in the development of EAFs to replace traditional blast furnace-basic oxygen furnaces (BF-BOFs), using scrap steel or H_2-HBI as inputs - that there is the most potential to quickly reduce carbon emissions.

While Nippon Steel has replaced some traditional BF-BOF facilities with EAFs, the future trajectory of these developments is lacking in scale and urgency. [15] Nippon Steel's EAF % ratio (EAF versus BF-BOF production capacity) was only 1.5% in 2022, compared to around 26% for Japan as a whole in 2019.[16] This lack of any significant progress also extends to the use of scrap steel, where Transition Asia calculates that average scrap usage in the company's domestic operations is around 15%. [17] [18] Indeed, this lack of increased use of scrap steel by Nippon Steel and other steel companies such Kobe Steel and JFE is a missed opportunity, given lower scrap prices in Japan, compared with other countries.[19]

Taken together, despite announcements of three decarbonisation focus areas, Nippon Steel has made limited real progress in decarbonising its operations.

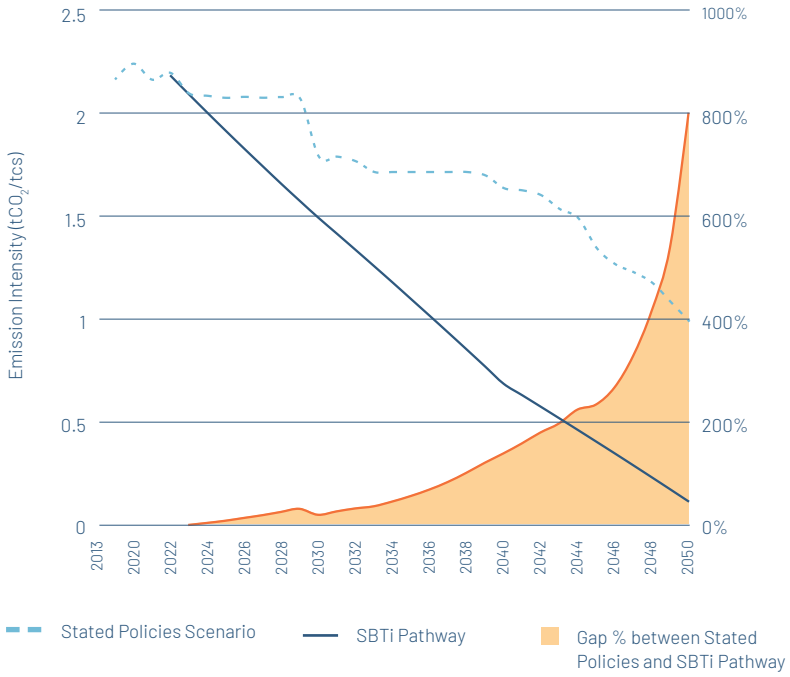
Table 1. Summary of Nippon Steel's technology areas for low carbon steel production[20]

	COURSE50	H_2-DRI	EAFs + Scrap/H_2-HBI
CAPEX	Unknown	Proven	Proven
Emission Reduction efficacy	30%	90%	95%
Upstream Challenges	Coal mining emissions	Hydrogen production and transportation	Scrap and H_2- HBI availability
Operational Challenges	Limited co-firing potential of Hydrogen in BF. Carbon capture's poor track record, significant energy requirements, and amine degradation	Hydrogen concentrations above 70%-80% remain challenging	None
Downstream Challenges	Transportation and storage of carbon dioxide	None	None
Status	R&D	Pilot	Production

EMISSION PATHWAY ANALYSIS

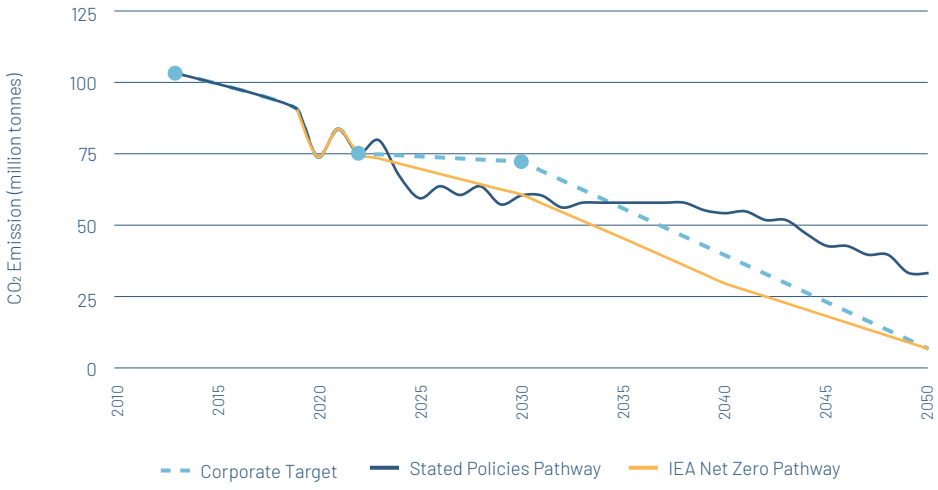
Transition Asia's analysis of both carbon intensity per tonne of steel and absolute emissions suggest that Nippon Steel is far from reaching common benchmarks used to measure decarbonisation trajectories and progress: the SBTi Iron and Steel Sectoral Decarbonisation Approach (SDA), and the IEA net-zero pathway.

Figure 1. Nippon Steel Carbon Intensity (tCO_2/t) vs SBTi Benchmark



- Nippon Steel's CO_2 intensity remains relatively flat before 2030, with no significant decrease. This is because all of Nippon Steel's decarbonisation plans (such as COURSE50, SuperCOURSE50) are scheduled to be implemented after 2030.
- After 2030, despite developments such as COURSE50, SuperCOURSE50, and some initiatives to transition from BF-BOF to EAF, Nippon Steel's CO_2 intensity decreases, but at a gradual slow rate and with very limited reduction. Even by 2050, the CO_2 intensity still remains around 1 tCO22/tcs.
- The rapid increase in the "Gap%" curve indicates that if Nippon Steel's decarbonisation efforts remain confined to those currently disclosed, the gap between its carbon emissions pathway and the SBTi target will grow exponentially towards 2050 due to the poor abatement potential of Course50 and SuperCOURSE50 technologies.

Figure 2. Nippon Steel Absolute Emissions vs IEA Net Zero Pathway



- By 2030, there is a 19% gap between Nippon Steel's corporate target emission point and the IEA net-zero pathway.
- Given Nippon Steel's target to reduce total CO_2 emissions by 30% by 2030 (from a 2013 baseline), its 2030 absolute emission would need to be around 72.4 million tonnes of CO_2 which Nippon Steel is expected to meet.
- From 2030 to 2050, the gap between the Nippons Steel's emissions and both the corporate target and the IEA net-zero pathway increases resulting in increasing pressure on realising carbon neutrality by 2050.
- To achieve a net zero target by 2050, Nippon Steel's emissions would need to fall 91% from 2030 levels, a reduction of 66 millions tonnes of CO_2.
- Nippon Steel's reliance on COURSE50 and SuperCOURSE50 technologies leads to extremely slow emission cutting speed, making Nippon Steel's projected emissions almost 5.6 times the IEA pathway or corporate target in 2050.

(DE)CARBONISATION DEVELOPMENTS IN THE LAST YEAR

Announced the replacement of BF in Yahata and BOF in Hirohata with EAF facilities
In addition to the instalment of EAF in Kurashiki which already began its operations in 2022, Nippon Steel firstly specified the BF in Yahata as the location where the replacement with another EAF is happening.

Announced that more effectiveness of the COURSE50 was confirmed
A 33% emission reduction, compared to the conventional effectiveness of 10%, was confirmed with the small-sized experimental blast furnace with the size of 12m^3.

Announced an MOU with Tenova for H2-DRI production
This facility's primary objective is to conduct a demonstration test for the development of direct hydrogen reduction technology aimed at reducing low-grade iron ore using hydrogen alone.

APPENDIX

What is this pathway analysis

- Stated Policy Scenario (SP) which is Transition Asia's judgement on asset level decarbonisation levers used by Nippon Steel. These judgements are based on public disclosures made by Nippon Steel. The SP scenario can be compared to various benchmarks, such as the sector specific IEA net-zero scenario.
- Both in terms of absolute CO_2 emission in million tonnes and emission intensity in tonnes of CO_2 per ton of crude steel production.

How corporate stated policies are integrated in the model, and how we set the scenarios

According to the policies disclosed by the company, major decarbonisation solutions include COURSE50, SuperCOURSE50 and large-scale EAF implementation. With regard to EAF implementation, there are some plant-based projects that have already been integrated into the pathway analysis model as key assumptions. However, information with regard to COURSE50 and SuperCOURSE50 implementation plans is limited to their starting year (COURSE50 starts from 2030, and SuperCOURSE50 starts from 2040). Therefore, two scenarios that assume different implementation schedules are introduced in this model.

- **Stated Policies Scenario:** considers each independent steel plant and integrates their individual relining schedule. All the blast furnaces that are scheduled to be relined during 2030~2040 are assumed to have COURSE50 from their relining year. Then, from 2040, SuperCOURSE50 will benefit all the blast furnaces that have already been influenced by COURSE50, together with the blast furnaces that are scheduled to be relined after 2040. Since plants' relining years are not concentrated during 2030–2040, this scenario will not cause SuperCOURSE50 to face huge pressure in the starting year of 2040.

Benchmarks

The IEA Net-Zero pathway: it reflects the net-zero roadmap of CO2 emissions in the iron and steel sector provided by IEA.[21]
The SBTi Intensity Target: reflects the sectoral decarbonisation approach target using the SBTi's Iron and Steel target setting tool.[22]

ENDNOTES

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11. "COURSE 50" is an umbrella initiative between the Japanese government and companies to reduce carbon emissions in the iron and steel sector.
12. "Tenova to Provide the First Hydrogen Experimental DRI Plant in Japan." 18 Mar. 2024, https://tenova.com/newsroom/press-releases/tenova-provide-first-hydrogen-experimental-dri-plant-japan
13. Hot Briquetted Iron (H2 HBI) is a transportable form of DRI, compacted at higher temperatures and having greater density.
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15. According to Nippon Steel, it has "started the commercial operation of a new electric arc furnace in the Setouchi Works Hirohata Area, and has full-scale studies on the shift from the blast furnace steelmaking process to the electric arc furnace steelmaking process, with the Kyushu Works Yawata Area and the Setouchi Works Hirohata Area as candidate sites." (Nippon Steel Sustainability Report: https://www.nipponsteel.com/en/csr/report/pdf/report2023en.pdf, pg. 12)
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