TransitionAsia
ACCELERATING ASIAN CORPORATE CLIMATE ACTION

VOICES FROM THE STEEL SECTOR: JAPAN'S SCRAP-EAF MILLS

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SUMMARY

- Transition Asia's initial hypothesis when entering interviews with scrap-EAF steel mills in Japan: that scrap-EAF mills would drive Japan's steel decarbonisation by improving operations, diversifying products and customers, and adopting green iron for primary steelmaking, did not hold true.
- After conducting interviews with many of Japan's leading EAF-based steel producers, we found that these companies are not currently planning changes to their businesses, such as expanding production capacity or diversifying their product or customer base. There was also no significant indication of plans to produce higher grades steel at scale or produce primary steel via EAFs.
- Japanese scrap-EAF mill operators, traders and steel insiders highlighted that the construction sector remains the dominant driver of demand for EAF-produced steel in Japan. Even though domestic demand signals are weak, many noted that low carbon steel products are already being developed in anticipation of future market shifts.
- As domestic consumption of steel decreases, scrap-EAF mills are expanding production overseas, along with Japan's primary steel producers. Notably, this includes Southeast Asia and the United States of America
- Several interviewees contrasted Japan with other regions, observing that in Europe and Southeast Asia, policy interventions are actively creating demand for low carbon, scrap-based steel, while Japan has yet to adopt similar measures.
- On emissions, the consensus is clear: scrap-EAF steel production still emits significant greenhouse gas emissions when not electrified by renewable electricity (RE). Interviewees agreed this presents a major opening for Japan: By linking scrap-EAF production with renewables, the sector could position itself as a genuine low carbon solution for their customers.

INTRODUCTION

While the majority of our analysis on decarbonising the steel sector in Japan has been focused on steel producers that produce the majority of their steel using blast furnaces (BFs), scrap-EAF-based steel producers have a role to play in lowering Japan's steel sector emissions as well. EAF steel making is largely expected to expand in Japan as the global investments into low carbon iron making indicate hydrogen-based direct reduced iron (H_2-DRI) processes as the iron producing technology of choice, and Japan is unlikely to develop a cost-efficient green hydrogen sector domestically. This is because of expensive RE and an energy sector under pressure from topographic, geographic and land availability constraints. Given these factors, we conducted a series of interviews with Japanese scrap-EAF steel mills and hypothesised that they would be leveraging their expertise in EAF steelmaking to move up the quality ladder, producing high grade, primary products traditionally the domain of Japan's primary producers, now possible to produce via new EAF technologies. Including diversifying customers and feedstocks; notably green-iron. To test this hypothesis, we undertook a series of in-depth interviews with scrap-EAF mills, traders and steel insiders. Our results indicated that Japanese scrap-EAF mills are not currently planning major changes, including expanding production capacity or diversifying their product or customer base. This report examines the challenges hindering their broader market participation and outlines the remaining actions needed to realise the full decarbonisation of the scrap-EAF sector.

BACKGROUND TO THE JAPANESE SCRAP-EAF SECTOR

While some Japanese scrap-EAF producers manufacture steel sheets for use in the manufacturing industry, the majority are heavily dependent on demand from the construction sector, a historical precedent derived from the sector's ability to absorb low grade steel made from obsolete scrap.[1] This reliance means that fluctuations in construction activity are directly correlated to scrap-EAF mill production and sales. In recent years, demand from the construction industry has stagnated due to rising material costs and a shortage of labour, leading to the suspension of numerous new projects.[2] [3]

At the same time, the influx of cheaper imported steel, particularly from China, has contributed to a decline of around 10% in domestic crude steel production via scrap-EAFs compared with two years ago.[4] [5] The top five Japanese scrap-EAF mills are; Tokyo Steel, Kyoei Steel, Godo Steel, Nakayama Steel Works and Yamato Steel, all reported year-on-year declines in domestic sales in FY2024.[6] [7] [8] [9] [10]

1 https://transitionasia.org/scrap-steel-explainer/
2 https://www.mlit.go.jp/report/press/joho04_hh_001299.html
3 https://www.nikkei.com/article/DGXZQOUB05B5T0V00C25A6000000/
4 https://www.japanmetal.com/news-t20241105138769.html
5 https://www.jisf.or.jp/en/statistics/
6 https://www.tokyosteel.co.jp/assets/docs/ir/disclosures/disclosures_20250425-03.pdf
7 https://www.kyoeisteel.co.jp/en/ir/library/result/main/01114/teaserItems1/01/linkList/05/link/E-2025-3_0430.pdf
8 https://www.godo-steel.co.jp/en/ir/material/pdf/20250425_Summary_Consolidated.pdf
9 https://www.nakayama-steel.co.jp/menu/news/ir_news_archive/250513_1e.pdf
10 https://contents.xj-storage.jp/xcontents/AS08507/ad97f62e/dbd7/4aba/a8b8/5033dfdc2814/20250516100750624s.pdf

Given this weakening domestic demand, scrap-EAF mills, especially those focused solely on long products, communicated that they cannot justify any significant expansion of production capacity.

BUSINESS-AS-USUAL

A recurring theme in the interviews was the business as usual mindset. Japanese scrap-EAF producers see little incentive to disrupt their established model of scrap-based production focused on long products for construction. Several factors explain this inertia:

- **Stable but Weak Demand:** The construction sector provides a steady baseline of demand, but growth is limited. Producers are reluctant to overextend into untested markets when domestic demand is not expanding.
- **Scrap Dependence:** Japan's relatively mature scrap collection system ensures a reliable feedstock for EAF operations. This creates a sense of security but also discourages innovation in material inputs.
- **Technology Conservatism:** Unlike other mature markets, where EAFs are being adapted to produce flat products for automotive and machinery applications, Japanese producers show limited inclination to pursue such product diversification.
- **Perceived Risk:** Moving into new product categories or technologies is seen as risky in a stagnant domestic market.

The Japanese scrap-EAF sector remains locked into a "business as usual" model, concentrating on established products such as rebar, sections, and other construction-related long steels, with little movement toward diversification. Expanding into new grades could open opportunities tied to rising demand from decarbonisation policies. Using alternative feedstocks such as imported hot briquetted iron (HBI) would also help mitigate risks from tightening global scrap supply while enabling the production of grades not easily achieved with obsolete scrap alone. Yet there are no concrete indications of such a shift. This inertia likely reflects a combination of weak domestic demand, limited technical expertise in higher-value products such as stainless steel, and the fact that many scrap-EAF mills are subsidiaries of BF steelmakers, making direct competition within the same domestic product lines difficult. Consequently, the sector is expected to continue operating largely as it does today.

DEMAND OVERSEAS IS RISING, DRIVEN BY POLICY

Southeast Asia is a long established destination for Japanese scrap and steel. Recently, scrap-EAF mills have been eyeing the increasing demand for steel products in the region, and several major investments and projects with Japanese involvement have been announced. Tokyo Steel as the largest Japanese scrap-EAF steelmaker has gained a contract for low carbon steel from Singapore, reaching 6,000 tonnes in total.[11] [12]

11 https://www.tokyosteel.co.jp/assets/docs/top/top_20250206-01.pdf
12 https://www.japanmetal.com/news-t20250609143284.html

Yamato Steel also plans to intensify its business in Southeast Asia as well as India where the demand is predicted to grow.[13] Meanwhile, Kyoei Steel this year brought a new rebar plant online in Vietnam, with an annual capacity of 500,000 tonnes, aiming for its Vietnamese operations to make up around half of its global production.[14] The company also announced the start of construction on a new EAF in Texas.[15] The firm is investing US$255 million to build a new EAF with a capacity of 300,000 tonnes per year, operated by its wholly-owned subsidiary, Vinton Steel.

Japanese scrap-EAF mills consistently highlighted that it is policy, rather than market forces alone, that underpins and accelerates demand for low carbon steel products abroad.

In particular, interviewees noted the Singaporean Green Building Masterplan, which aims to ensure that 80% of buildings (by floor area) are classified as "green" by 2030 and is seen as a driver and regional blueprint for stimulating low carbon steel demand.[16] In addition, the Built Environment Transformation Gross Floor Area (GFA) Incentive Scheme, launched in 2021 was noted as a pivotal policy for driving green steel demand in Singapore; offering private sector developers up to 3% additional GFA beyond the Master Plan Gross Plot Ratio (GPR), provided their developments—on private sites of at least 5,000 sqm—meet certain criteria, such as embodied carbon targets.[17] [18]

Japanese scrap-EAF mills also describe Europe as a region with attractive regulation for fostering the use of scrap-EAF steel. Demand for scrap-EAF steel has increased since the launch of the EU's Circular Economy Action Plan in 2020. Building on this, in Q4 2026, minimum recycled content requirements will be introduced for steel and aluminium used in the automotive and construction sectors.[19]

DECARBONISATION OPPORTUNITIES

Japanese scrap-EAF mills present a clear opportunity in the context of decarbonisation, as the sector currently emits less than 80% CO_2 than steel produced via BFs and further decarbonisation is possible and meaningful through the use of RE.[20] This makes it an attractive option for downstream customers seeking to further reduce their Scope 3 emissions.

PPAS ARE THE PREFERRED MITIGATION TOOL

Japan's annual CO_2 emissions from scrap-EAF-based steel production are estimated at around 4.8 million tonnes (Scope 1 and 2), which is still a significant amount. In theory, roughly 80% of these emissions could be abated through the use of RE. Many scrap-EAF producers see power purchase agreements (PPAs) as a practical solution beyond cost hedging; there is simplicity and reliability of a PPA's environmental credentials. Compared to energy attribute certificates (EACs)—such as the Non-Fossil Certificate scheme used in Japan—PPAs are generally easier to manage from a communications

13 https://www.nikkei.com/article/DGXZQOUF163ER0W4A610C2000000/
14 https://www.nikkei.com/article/DGXZQOGM03BLU0T00C25A6000000/
15 https://www.kyoeisteel.co.jp/en/news/release/release-384784747947145169 2.html
16 https://www1.bca.gov.sg/buildsg/sustainability/green-building-masterplans
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18 https://www1.bca.gov.sg/docs/default-source/bca-awards-2020/bca-green-mark-certification-requirement-for-gls-site_-2-dec-2022_final.pdf
19 https://www.meti.go.jp/shingikai/mono_info_service/green_steel/follow_up/pdf/001_07_00.pdf
20 https://transitionasia.org/japanese-eaf-steel/

standpoint, generally offering a fixed, pre-agreed supply of green electricity. However, due to the uncertainty around long-term RE prices, many scrap-EAF steelmakers are cautious about entering into fixed-price PPAs, as it remains unclear whether such contracts will deliver cost savings compared to future grid prices. Combined with ongoing uncertainty around demand for green steel, this has so far deterred a significant shift towards large-scale renewable procurement via PPAs. As a result, even Nippon Steel has announced that it is considering the construction of four new gas-fired power units fuelled by liquefied natural gas, with a total capacity of 2,000 MW, to supply electricity to its new EAF facilities, rather than relying on renewable sources.[21]

LOW CARBON STEEL PRODUCTS ARE BEING DEVELOPED AMONGST WEAK DOMESTIC DEMAND SIGNALS

In Japan, primary steelmakers have been slow to pursue decarbonisation, with many relying on a product range incorporating the mass balance method, an approach that has faced scrutiny for its lack of transparency and credibility, particularly in international markets. This has opened the door for more credible low carbon alternatives like EAF-based steel, with significantly lower life cycle emissions.

Tokyo Steel and Yamato Steel have launched low carbon steel brands using non-fossil fuel certificates, while Chubu Steel Plate has also announced the launch of a green steel brand.[22] [23] [24] According to scrap-EAF steelmakers and trading companies, there is some domestic demand for these products from manufacturers and construction firms seeking to address their Scope 3 emissions, but the primary driver of developing these products was to meet expected international demand for low carbon steel products. Domestically, many companies remain hesitant to purchase these products due to the price premium over conventional scrap-EAF steel.

All business operators interviewed agreed that Japan's domestic market is facing extremely challenging conditions and that stronger policy intervention is essential to stimulate demand for low carbon steel.

CONCERN FROM SCRAP-EAF STEELMAKERS THAT PRIMARY STEEL PRODUCERS ARE GAINING OWNERSHIP OF GREEN STEEL DEFINITIONS

Japan has several existing or potential policy measures aimed at encouraging demand for green steel. That said, the interviewees conveyed that the definition of "green steel" under these policies is based on guidelines issued by the Japanese Iron & Steel Federation (JISF), an industry body representing the three primary steel producers,

21 https://www.nikkei.com/article/DGXZQOJC02A7F0S5A700C2000000/
22 https://www.tokyosteel.co.jp/assets/docs/top/hobozero_release.pdf
23 https://www.yamatokogyo.co.jp/en/steel/plusgreen/
24 https://www.chubukohan.co.jp/ckCMS/wp-content/uploads/2025/06/

rather than being provided by the government independently. It remains unclear whether scrap-EAF-produced steel qualifies under these definitions. There are concerns, among downstream customers and scrap-EAF mills, that their steel may not be eligible under the current framework. This lack of clarity is a growing concern for many producers, who fear their products—mainly used in the manufacturing and construction sectors—could be left out of green procurement schemes, while mass balanced steel from Japan's primary steel producers is prioritised.

Despite their lower carbon intensity, the concern amongst scrap-EAF producers is that they risk losing market share. Most are not looking to enter high-grade or specialty markets, but are now simply concerned if their existing business may be eroded through implementation of the series of policies giving more favour to mass balanced steel. Without a clear and inclusive definition of green steel, what should be a commercial opportunity may instead become a competitive disadvantage, both for scrap-EAF producers and Japan's broader decarbonisation goals.

The upcoming GX-ETS carbon pricing scheme, due to launch in FY2026, could help reduce the price gap between conventional and green steel. A clearer and solid outlook of carbon pricing, namely how much it will be, is crucial in driving supply side change for the steel sector.

RECOMMENDATIONS TO REALISE THE FULL DECARBONISATION OF THE SCRAP-EAF SECTOR

Given the limited appetite for business model transformation among Japan's scrap-EAF producers and the prevailing market outlook, the sector's full decarbonisation potential will only be realised if operations are powered by RE and if the resulting low carbon products can secure sufficient market demand. Achieving this requires a targeted policy and market framework that both incentivises RE adoption and creates clear demand signals for green steel. To this end, we outline two key recommendations designed to unlock this opportunity.

A CLEAR, EAF-INCLUSIVE GREEN STEEL TAXONOMY REQUIRING USE OF 100% RE SETS AN ACHIEVABLE PRECEDENT

To stimulate demand for green steel in Japan, it is essential that government-backed definitions of green steel explicitly encompass EAF steel. Reflecting a growing consensus between environmental groups and scrap-EAF mills, a number of companies and organisations have already called for such recognition.[25] Compared to mass balance-based green steel supplied by Japan's primary steelmakers, low carbon scrap-EAF steel is not only more affordable but is also widely accepted as genuinely low carbon.

It is equally important that the taxonomy for low carbon EAF steel stipulates the use of 100% RE. This requirement would not only incentivise all EAF production to switch to RE, but also strengthen the value proposition of EAF steel, clearly positioning it as far lower in emissions than BF-BOF steel. A robust and credible definition of green EAF

25 https://www.meti.go.jp/shingikai/mono_info_service/green_steel/pdf/005_04_00.pdf

steel would help meet rising expectations for genuinely low carbon products and provide clarity to the sector.

PROMOTION OF EAF STEEL WITH LOW LIFECYCLE EMISSIONS FOR USE IN CONSTRUCTION AS A LOGICAL DEMAND SIDE LEVER

With the sector's close ties to the construction sector, many steel companies are wanting to leverage their ability to produce steel with low embodied carbon to provide decarbonisation solutions for the construction sector. Regulation and guidance for both the scrap-EAF and construction sectors are seen as critical in breaking the supply demand deadlock between these two sectors.

A welcome move is now witnessed in line with this direction, which may have the potential to drive decarbonisation in the steel industry and the construction, real estate and engineering industries. Japan's Ministry of Land, Infrastructure, Transport and Tourism established an advisory committee discussing LCA's for buildings.[26] The committee is developing the scheme in which steelmakers and raw material recyclers, in addition to construction companies, can be involved so that the upstream business operators can play an active role in the decarbonisation of construction projects.

As part of these discussions, a labelling scheme is also expected to be introduced. This scheme is anticipated to provide clearer guidance on access to green finance, enabling both steel and construction companies to better align with sustainability-linked investment criteria. For construction firms, the use of low carbon materials, such as green steel, could support the ability to sell properties at a premium. The initiative is also likely to attract institutional investors seeking to decarbonise their portfolios, further increasing demand. In addition, it may help facilitate the development of a green mortgage market, in which buildings that meet strict environmental standards benefit from preferential loan terms or lower interest rates.

26 https://www.mlit.go.jp/jutakukentiku/build/jutakukentiku_house_tk4_000302.html

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