TransitionAsia
ACCELERATING EAST ASIAN CORPORATE CLIMATE ACTION

2024 SUSTAINABILITY REPORT UPDATES: JFE HOLDINGS

Sep 2024

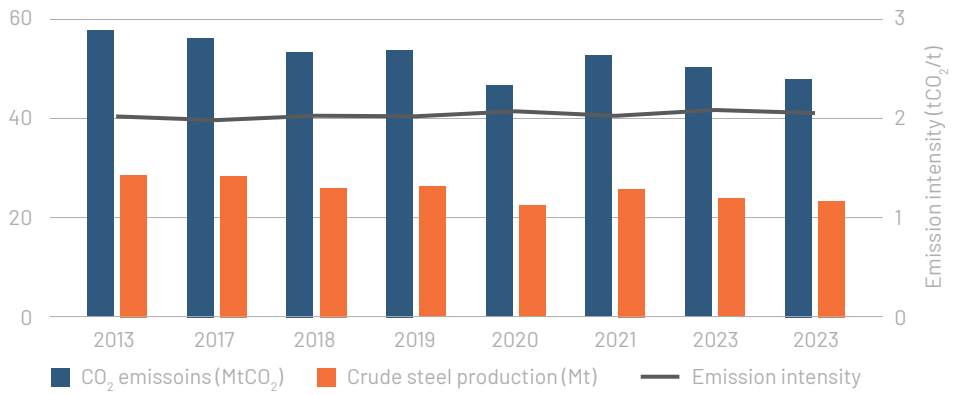
INTRODUCTION

JFE Holdings has released its latest sustainability report, no major announcements are made with few changes from last year's report. The emissions data shows that the company's emissions are gradually approaching its 2024 reduction targets. However, the sustainability report's latest emissions intensity data shows that without a reduction in production volume, total emissions would not have decreased materially. Suggesting that to date, JFE Holdings' most impactful decarbonisation measure is to reduce steel production. Furthermore, the company has reaffirmed its commitment to using blast furnaces (BFs) in the long-term by investing in metallurgical coal projects. According to our estimates, unless these approaches change, achieving carbon neutrality by 2050 will be difficult.

JFE HOLDINGS

JFE Holdings is steadily progressing toward its 2024 goal of reducing emissions to 47.6 million tCO_2, an 18% decrease from 2013 levels. Notably, the reduction in emissions so far has been primarily driven by a decrease in production volume, as emission intensity has remained largely unchanged since 2013. Due to increasing emissions intensity per tonne of steel from 2013, our analysis reveals that 109% of the emission reductions during this period were due to lower production, emission intensity negatively impacted the overall reduction by -9%. This indicates that over the past decade, decarbonisation measures are missing from JFE Holding's's business operations, and the reduction in steel production is the only lever of emissions reduction currently being used by the company.

Figure 1: JFE Holdings Annual Steel Production and Emissions Trends



Source: Transition Asia, JFE Holdings [1] [2] [3] [4] [5]
Note: All figures are non-consolidated

1 JFE Holdings 2024 Sustainability Report
2 JFE Holdings Financial Results for Fiscal Year 2023
3 JFE Holdings 2023 Sustainability Report
4 JFE Holdings Report 2023
5 JFE Holdings 2022 CSR Report

JFE Holdings has identified seven BFs to be eventually replaced by various technologies, including carbon recycling, DRI, and EAF technologies. These initiatives so far include:

1. **Carbon Recycling:** This technology is designed for use in existing BFs and aims to reduce emissions by 50% compared to conventional BF-based iron production. However, it is important to note that trial operations for a small pilot BF, which is 1/25th the scale of a full-sized furnace, have not yet begun; these are scheduled for 2025–2026. The implementation of this technology in a commercial, medium-sized BF, at 1/4 scale is planned for 2030.

2. **Direct Reduced Iron (DRI):** A DRI project is currently under development, with initial pilot testing scheduled for 2024. Although this R&D project is labelled as an H_2-DRI initiative, the DRI shaft will utilise methane produced by a methanation plant, meaning it is not a purely hydrogen-based DRI facility. The carbon for the methanation plant will be sourced from captured off-gases from the DRI shaft, while hydrogen will be supplied externally. In 2022, JFE Holdings entered into an agreement with Itochu and Emirates Steel to source low carbon HBI from abroad for use within its operations for high quality, high performance steel. This project is still expected to begin in the latter half of 2025.

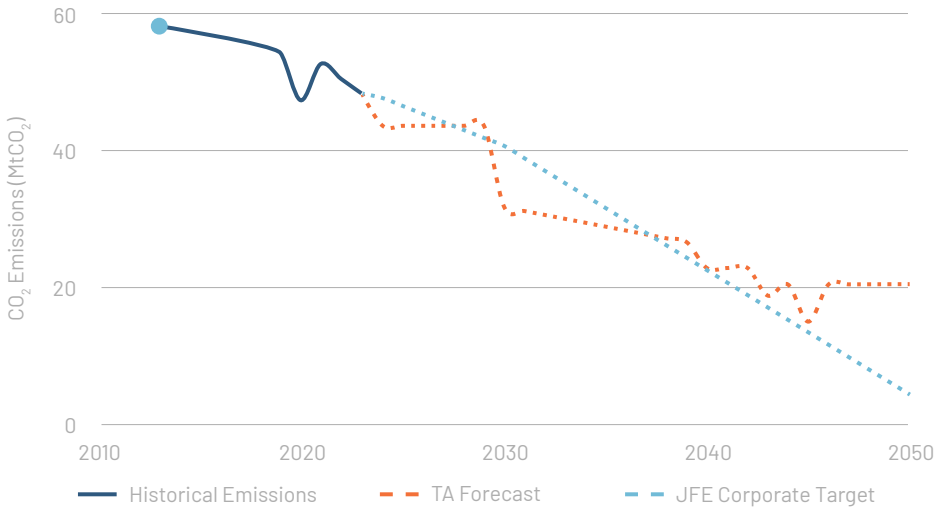
3. **EAF:** JFE Holdings plans to expand EAF operations, including projects in Kurashiki (high-quality steel sheet, EAF refurbished from 2027–2030) and Sendai (upgrading the existing furnace in 2024, low-quality steel products), with expected annual emission reductions of 2.6 $MtCO_2$ and 0.1 $MtCO_2$, respectively. The investment decision on the Kurashiki works on the large-scale EAF will be made within a year. In 2025, JFE Holdings also plans to build a small, new EAF in Chiba, which is expected to reduce CO_2 emissions by up to 0.45 $MtCO_2$. A small 10 tonnes test EAF is also planned for testing within 2024.

It is still unclear to what proportion each of these decarbonisation technologies will be used across JFE Holdings' steel assets. EAFs are mature technologies and H_2-DRI is the dominant decarbonisation technology of choice for near-zero emission primary steel globally. No carbon recycling with emission reduction poentials of 50% exist in the steel sector.

The shutdown of one BF in Kurashiki around 2030 will lead to a significant reduction in CO_2 emissions. Beyond this, our analysis indicates that if carbon recycling, DRI and EAF measures are implemented, emissions will continue to gradually decrease. Additionally, the refurbishment of multiple BFs in the early 2040s is expected to temporarily reduce production volume, helping to keep emissions in line with the 1.5°C pathway.[6] However, after 2045, as production volumes return to previous levels, further reductions will become difficult and the gap between actual emissions and target values will widen, ultimately resulting in a 65% reduction compared to 2013 levels.

6 IEA Net Zero Roadmap

Figure 2: Comparative CO_2 Emission Scenarios for JFE Holdings Steel Operations (Non-consolidated): JFE Holdings Corporate Targets and Transition Asia Model Projection to 2050



Source: Transition Asia, JFE Holdings [1][2][3][4][5]

ENVIRONMENTAL IMPACT OF RECENT OVERSEAS INVESTMENTS IN METALLURGICAL COAL

In August 2024, JFE Steel, in partnership with Nippon Steel, announced new investments in metallurgical coal in Australia, reaffirming its long-term commitment to steel production using coal-based BFs.[7] Our analysis shows that the annual emissions per US$ 1 of investment amount to 7.36 $kgCO_2$—a significant figure, especially compared to the 4.57 $kgCO_2$ per US$1 of investment for the Byerwen Coal Project, which began supplying coal to the company in 2019.[8] Additionally, considering that the company's annual emissions per US$1 of stock investment at the end of FY2023 were 4.53 $kgCO_2$, the environmental impact of this latest investment is clear.

CONCLUSION

JFE Holdings needs to reduce emissions not by cutting production volumes, but by more actively transitioning from BF steel to expanding and utilising EAFs and increasing their focus on imported low-carbon HBI. Furthermore, continued investments into metallurgical coal mines represent sunk costs for the company with JFE Holdings' capital having the potential to be utilised far more effectively if directed towards proven technologies. We believe this approach would strengthen the certainty of its decarbonisation efforts and enhance its corporate value.

7 https://www.jfe-steel.co.jp/en/release/2024/08/240822.html
8 https://www.jfe-steel.co.jp/en/release/2019/190123.html

DATA AND DISCLAIMER

This analysis is for informational purposes only and does not constitute investment advice, and should not be relied upon to make any investment decision. The briefing represents the authors' views and interpretations of publicly available information that is self-reported by the companies assessed. References are provided for company reporting but the authors did not seek to validate the public self-reported information provided by those companies. Therefore, the authors cannot guarantee the factual accuracy of all information presented in this briefing. The authors and Transition Asia expressly assume no liability for information used or published by third parties with reference to this report.

OUR TEAM

Head of Impact

Lauren Huleatt lauren@transitionasia.org

Japan Analysts

Kenta Kubokawa kenta@transitionasia.org

ESG Junior Research Fellow

Akira Kanno akira@transitionasia.org

ABOUT TRANSITION ASIA

Founded in 2021, Transition Asia is a Hong Kong-based non-profit think tank that focuses on driving 1.5°C-aligned corporate climate action in East Asia through in-depth sectoral and policy analysis, investor insights, and strategic engagement. Transition Asia works with corporate, finance, and policy stakeholders across the globe to achieve transformative change for a net-zero, resilient future. Visit transitionasia.org to learn more.