

Press release

China's steel sector invests USD 100 bn in coal-based steel plants, despite low profitability, overcapacity and carbon commitments

LONDON/BEIJING, 1 August 2023 – Chinese steel firms are making massive investments in new, coal-based steelmaking capacity. Companies received approvals from provincial governments for 119.8 million tonnes per annum (Mtpa) of new blast furnaces, and 76.6 Mtpa new basic oxygen furnaces from 2021 until the first half of 2023 (2021–2023 H1), despite low profitability, overcapacity and carbon commitments, finds the latest briefing from the Centre for Research on Energy and Clean Air (CREA).

CO₂ emissions from the new coal-based steel plants, if fully operated, will be approximately equal to the entire emissions of the Netherlands.

The steel sector contributes 17% of China's yearly greenhouse gas emissions, ranking the second-largest emitting sector in the country, and is set to peak emissions before 2030. The sum of the approved iron and steelmaking projects in 2021–2023 H1 represents an estimated USD 100 billion in new investments, which risk being stranded assets, as China's 2060 carbon neutrality goal will require early retirement of coal-based steelmaking facilities, and steel consumption is projected to decline.

The briefing also shows the total profits of the steel sector have declined to historically low levels, with the sector as a whole turning lossmaking in the 12 months to March 2023 and thereafter. In spite of the lack of profitability, capital expenditures have stayed at a record high level, with an average of approximately USD 30 billion allocated towards the construction of new capacity annually. This amount of investment in new capacity is equal to the expenditure that would be required over three decades to decarbonise Germany's entire steel sector, according to government estimates.

The briefing also shows budding progress on shifting investments into facilities that are less carbon intensive. New proposed electric arc furnace (EAF) projects increased in 2021–2023 H1, to a total of 52.5 Mtpa. Nonetheless, the coal-based BF-BOF route still dominates new iron and steel projects in China. It accounts for approximately 99% of the new ironmaking capacity and 70% of the new steelmaking capacity.



By 2025, nearly all of these new permitted iron and steel projects will commence operations. With new facilities in operation, the operating iron and steelmaking capacity might increase and worsen the excessive supply situation in the market.

Without strong regulatory measures or demand side requirements, steelmakers are likely to continue using their current production methods. The cost and financial implications of transitioning to cleaner technologies, combined with the lack of clear incentives, can deter companies from voluntarily adopting decarbonisation measures.

'Regulations and demand side requirements can play a crucial role in driving the transition to cleaner steel production. By imposing emissions reduction targets, providing financial support, and creating market incentives, governments can compel steelmakers to change their production methods and invest in decarbonisation technologies', said Xinyi Shen, Researcher at CREA.

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Contacts

Hannah Ekberg
Communications Specialist
Centre for Research on Energy and Clean Air (CREA)
Phone: +352 691 236 163
Email: hannah@energyandcleanair.org

Xinyi Shen
Researcher
Centre for Research on Energy and Clean Air (CREA)
Phone: +86 18058721870
Email: xinyi@energyandcleanair.org

About CREA

The Centre for Research on Energy and Clean Air (CREA) is an independent research organisation focused on revealing the trends, causes, and health impacts, as well as the solutions, to air pollution. CREA was founded in December 2019 in Helsinki and has staff in several Asian and



European countries. The organisation's work is funded through philanthropic grants and revenue from commissioned research.

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About the methodology

Information on new iron and steel projects was compiled from the websites of provincial Industrial and Information Technology Bureaus and Ecology and Environment Bureaus, which are responsible for implementing steel overcapacity and capacity replacement policies, and environmental permitting of new steel plants, respectively. New project announcements were mapped systematically, and total blast furnace, basic oxygen furnace and electric arc capacity, as well as capacity being replaced, was captured for each project. Duplicates were removed from the analysis.

The cost of iron and steel projects was estimated based on the [Global Energy Monitor's](#) report. These cost levels are indicative, as capital costs vary due to a host of factors including unit size; location; boiler, pollution control, cooling etc. technology employed; and whether the plant is a combined heat and power or an electricity-only plant. The way in which the impact of asset stranding is realised in the economy can include unrecoverable initial investment, unpaid interest to bank loans, and the unrecoverable expected returns to equity due to forced early retirement and/or underutilisation of new or existing assets. Soon the carbon price and CCS cost also need to be added on.