A closer look at 2023 emissions: steelmaking caused a quarter of industry pollution

This brief analyses 2023 emissions under the **EU Emissions Trading System (EU ETS)**, using the latest data available from the **EU Transaction Log (EUTL)**[1]. It particularly focuses on the iron and steel sector.

2023 ETS data overview: a stable surplus of allowances

On 30 September 2024, installations covered by the EU ETS had to surrender emission allowances to match their greenhouse gases emitted under the scheme in 2023. This follows a first deadline for plant operators to report their verified emissions by 31 March 2024. Preliminary data was therefore available from that date, but it was gradually updated as some installations reported emissions after the deadline.

In 2023, **emissions from stationary installations** equalled 1,096 million tonnes of CO2 equivalent (m tCO2e), a **16.5% decrease** from the 1,313m tCO2e recorded the previous year. This decline is even steeper than the 15.5% reduction reported by the European Commission based on preliminary data[2].

Stationary emissions were 390m tCO2e, which is **26% lower** than the ETS cap that was set to 1,486m tCO2e. The Market Stability Reserve (MSR) withdrew 322 million European Union Allowances (EUAs) from the market. Of the remaining 1,164 million allowances, only 1,055 million were distributed, while the remaining 109 million was kept aside in different reserves.

The total **surplus of allowances** only marginally **decreased to 1,068 million** at the end of 2023, compared to 1,109 million in 2022. Besides, in 2023, **528 million allowances** were allocated for free to industry (excluding the power sector), covering **84% of total industry emissions**. This represents an increase compared to 2022, where 78% of emissions were covered by free allowances.

[1] European Union Transaction Log. (5 July 2024). European Commission – Directorate-General for Climate Action. Available here.
[2] *Record reduction of 2023 ETS emissions due largely to boost in renewable energy*. (3 April 2024). European Commission - Directorate-General for Climate Action. Available here.

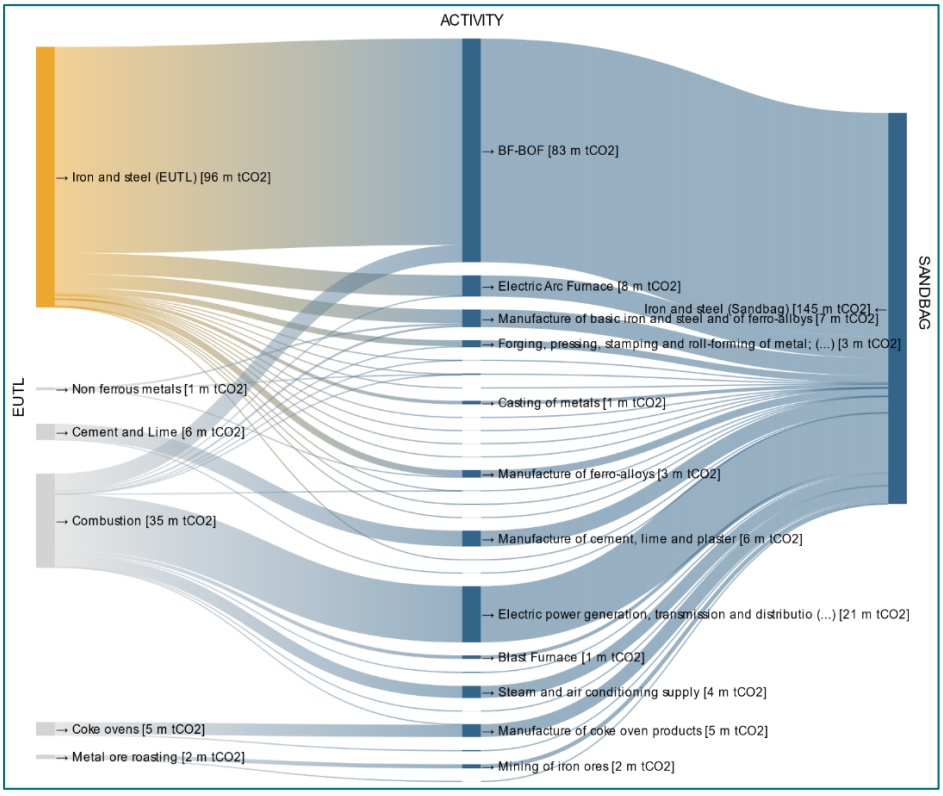
Steel emissions dominate industry emissions

A revised sector allocation better reflects the impact of iron and steel

Our analysis reveals that while the power sector remained the main source of emissions in the EU ETS, with **471m tCO2** (i.e. **41% of total emissions**), down 25% from 631m tCO2 in 2022 – **iron and steel was the leading emitter within the industry.**

We integrated certain power plants (labelled "combustion" under EUTL activity types) into the iron and steel sector, as we believed it more appropriate to attribute emissions from the combustion of blast furnace or coke oven gases in power plants to iron and steel. Our reasoning was that these emissions are driven by the activity of steel mills rather than by electricity demand.

We also grouped under "iron and steel" emissions from coke ovens, ferro-alloy manufacturing and the production of lime used for steelmaking (based on geo-localisation data). Our categorisation distinguishes emissions between power and heat production (which are bundled together in the EUTL) and, where applicable, attributes heat production emissions to their respective value chain (chemicals, mineral oil etc.). **The Sankey diagram below illustrates how this mapping worked out for iron and steel.**



Steel value chains installations

Our classification of installations within each sector is based on a combination of data from the **EU Transaction Log**, Statistical Classification of **Economic Activities in the European Community (NACE)**, and from **installation websites**.

In the Sankey diagram, the correspondence between **EUTL-based (left)** and **Sandbag (right)** classification uses "activity" information based on those other collected data types.

Iron and steel: the largest industrial emitter

Under this sector allocation, iron and steel come out as the most emitting industrial sector, with **145m tCO2 in 2023**, far ahead of cement and lime (**124m tCO2**). By comparison, with a sector breakdown based on EUTL activity types[3], iron and steel plants only emitted **96m tCO2**, ranking third behind cement and lime (**117m tCO2**) and mineral oil (**105m tCO2**).

As a result, the iron and steel value chain accounted for 25.5% of the total 569m tCO2s emitted by all industry plants covered by the EU ETS in 2023.

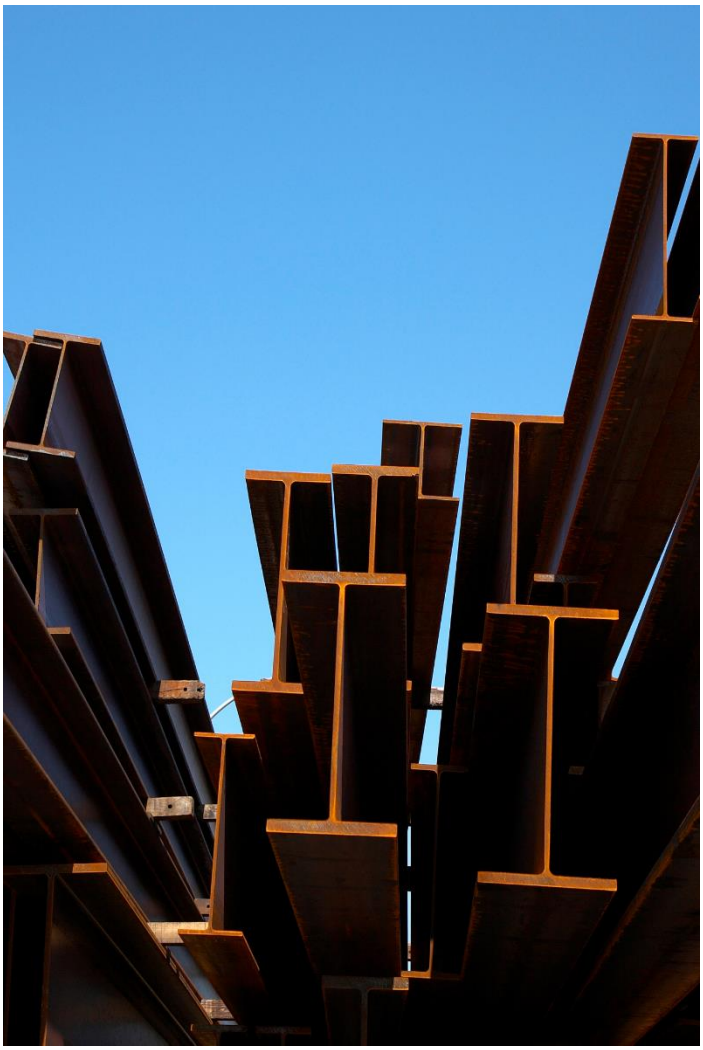
All these data are available in **Sandbag's interactive dashboard**.

About the EU ETS

The analysis of this brief was conducted with our **EU ETS Dashboard**, a tool developed by Sandbag to navigate the emissions data covered by the EU Emissions Trading system at various granularity levels. The dashboard allows to explore the average emissions per year by country and by sector from 2005 to 2023. It also compares historical allowances covered by auctions, offsets and free allocations from 2005 to 2023. Click here to use the dashboard.

About Sandbag

Sandbag is a non-profit think tank that develops **evidence-based** climate solutions. With advanced **research**, **data modelling**, and **visualisation tools**, we advocate for policies that drive rapid, cost-effective emissions reductions. Focusing on **carbon pricing**, **industry**, and **energy**, we ensure inclusive solutions to combat climate change. Learn more on our website, our follow us on social media.



[3] Under EUTL activity types, the iron and steel group is composed of: installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting, production of pig iron or steel, and production or processing of ferrous metals.