



Guide to technology abbreviations used in the Green Steel Tracker

BF-BOF – the traditional steelmaking pathway, which still accounts for roughly 70% of global steel production ([IRENA, 2023](#)). It is responsible for significant CO₂ emissions due to heavy reliance on coal and coke

BF (Blast Furnace): Iron ore, coke (coal), and limestone are used to produce molten iron (hot metal). This is highly energy-intensive.

BOF (Basic Oxygen Furnace) The molten iron from the BF is converted into steel by blowing oxygen into it.

DRI (Direct Reduced Iron) or sponge iron is produced from the direct reduction of iron ore pellets into iron by using a reducing gas, such as natural gas, syngas or hydrogen. DRI replaces the **ironmaking stage** in traditional steelmaking, specifically replacing the **blast furnace (BF)** and the associated **coke oven** and **sintering plant**, which are major sources of emissions. The level of emissions reduction achieved depends on which reducing agent is used. When hydrogen is used as the reducing gas, no carbon dioxide is produced

Hisarna - A "smelting reduction" process that removes the need for pre-processing raw materials, eliminating sintering and coking plants from steelmaking. It is more energy efficient, and when combined with carbon capture and storage (CCS), the Hisarna process can reduce CO₂ emissions by up to 80%.

Biogenic syngas DRI gasified biomass (wood residues, forest waste) instead of fossil-based natural gas or coal is used to reduce the iron ore in the DRI process.

H-DRI where hydrogen is used rather than gas in the production of sponge iron.

NG-DRI – H-DRI represents projects that have a pathway from using natural gas in the DRI process toward hydrogen.

CCS (carbon capture and storage) in steelmaking separates CO₂ from the blast furnace or DRI plant flue gases, and stores it permanently underground to mitigate high sector emissions.

CCS (carbon capture and utilization) the CO₂ separated and stored from the blast furnace or DRI plant is converted into products like concrete or chemicals.

EAF (electric arc furnace) - a furnace that uses electricity to create an electric arc for very high temperature heating. EAFs bypass the need to produce liquid pig iron from iron ore, instead melting recycled solid scrap or Direct Reduced Iron (DRI). When powered by renewable energy, EAFs can reduce the emissions associated with the BF-BOF route

ESF (electric smelting furnace) – a furnace that also uses electricity but with a different operation to EAFs, they can take different grades of feedstock. The ESF is specifically designed to melt Direct Reduced Iron (DRI)

Electrochemical process and Molten Oxide Electrolysis (MOE), remove the need for blast furnaces and coal by directly reduce iron ore to iron using electricity instead of carbon. This offers a CO₂ free pathway. Oxygen is released as the only byproduct.

Electrowinning also removes the need to rely on coal and blast furnaces to produce iron. Instead, it dissolves iron ore in an aqueous solution and uses an electrical current to separate out the iron.