

8 July 2024

- ArcelorMittal Gent is hosting the first industrial trial of D-CRBN's technology
- Unit was connected on 1 July 2024
- MHI's carbon capture unit, being tested in Gent, provides high-purity CO₂ for the D-CRBN unit

ArcelorMittal and Mitsubishi Heavy Industries, Ltd. (MHI) are working with a climate tech company, D-CRBN, to trial a new technology to convert carbon dioxide (CO₂) captured at ArcelorMittal's plant in Gent, Belgium into carbon monoxide which can be used in steel and chemical production.

This is the first industrial testing of D-CRBN's plasma technology, making ArcelorMittal Gent the first steel plant in the world to trial the process, which has been designed to reduce CO₂ emissions.

This new trial expands the current multi-year carbon capture pilot taking place at the site to test the feasibility of full-scale deployment of MHI's carbon capture technology (Advanced KM CDR Process™).

D-CRBN, an Antwerp-based company, has developed a technology that uses plasma to convert carbon dioxide into carbon monoxide. Using renewable electricity, the plasma is used to break the carbon-oxygen bond, thereby converting CO₂ into carbon monoxide. The carbon monoxide can be used as a reductant in the steelmaking process – replacing part of the coke or metallurgical coal used in the blast furnace – or as a basic ingredient in Gent's Steelanol plant, for chemicals or alternative fuel production.

The D-CRBN process requires high-purity CO₂, which can be provided by MHI's carbon capture unit, currently being used to capture blast furnace off-gases, and off-gases from the hot strip mill reheating furnace, in Gent.

A pipeline between MHI's carbon capture unit and D-CRBN's unit was connected on July 1st, to test the feasibility of using the CO₂ captured by the MHI technology as a feedstock for D-CRBN. The industrial pilot is an important stage of testing D-CRBN's technology, to make sure that any impurities that accompany the CO₂ produced during steelmaking do not have a detrimental effect on the process and product gas.

ArcelorMittal is pursuing a number of decarbonisation routes in order to achieve its climate targets, which include a 35% reduction in CO₂ emissions from ArcelorMittal Europe, by 2030. One of these routes is Smart Carbon steelmaking, which uses circular carbon in the blast furnace, carbon capture and storage (CCS) or utilization (CCU).



Manfred Van Vlierberghe, CEO, ArcelorMittal Belgium, said, "We are proud to be part of this unique carbon capture and usage trial in Gent, which is part of our strategy to develop the Smart Carbon steelmaking route in ArcelorMittal Belgium. Our

team of engineers has worked hard with our partners to reach this stage – and we are thrilled that our new partner, D-CRBN, have created this new CCU technology here in Belgium.”.

Gill Scheltjens, CEO at D-CRBN, said, “D-CRBN is thrilled to partner with ArcelorMittal and Mitsubishi Heavy Industries on this innovative carbon capture and utilization (CCU) pilot project. Electrifying steel production is challenging, but D-CRBN's process, which recycles CO₂ emissions back into CO, offers a cost-effective and scalable solution. Our technology can electrify and decarbonise existing blast furnaces and significantly reduce their coal use. The conversion of CO₂ back into CO for steel production will limit the need for green hydrogen in the future and reduce the costs of emission-free products. Moreover, some of the CO produced can be supplied to neighboring chemical companies as feedstock.”

MHI's Senior Vice President (CCUS) of GX (Green Transformation) Solutions, Tatsuto Nagayasu, said, “CCUS will play a critical role in decarbonising existing assets in the steel industry. Our collaboration with ArcelorMittal and D-CRBN in Belgium provides another tool for the industry to reduce its carbon footprint — capturing emissions, converting them into a valuable feedstock, and feeding them back into the process. This initiative demonstrates our commitment to sustainable practices and innovative solutions for a greener future.”

ArcelorMittal, MHI, BHP and Mitsubishi Development Pty Ltd (Mitsubishi Development) announced in May 2024 that they had successfully started operating a pilot carbon capture unit on the blast furnace off-gas at ArcelorMittal Gent in Belgium. In October 2022, the four parties announced their collaboration on a multi-year trial of MHI's carbon capture technology (Advanced KM CDR Process™) at multiple CO₂ emission points, starting at the Gent steelmaking site.