

Trial carbon capture unit begins operating on Blast Furnace at ArcelorMittal Gent, Belgium

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GENT, May 22, 2024 - ArcelorMittal and partners Mitsubishi Heavy Industries, Ltd. (MHI), BHP, along with Mitsubishi Development Pty Ltd (Mitsubishi Development) have successfully started operating a pilot carbon capture unit on the blast furnace off-gas at ArcelorMittal Gent in Belgium.

The pilot carbon capture unit will operate for one to two years at Gent, to test the feasibility of progress to full-scale deployment of the technology, which would be able to capture a sizeable portion of the Gent site emissions, if successful. Engineers have been working on site since January to assemble and commission the unit.

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 carbon dioxide (CO₂) emission points, starting at the Gent steelmaking site. The pilot carbon capture unit will be testing initially with blast furnace and reheating furnace gas and has the potential to be trialled to capture other important steelmaking gases such as reformer flue gas from a Direct Reduced Iron (DRI) plant.

The development of the carbon capture solution at Gent could feed into multiple CO₂ transport and storage projects under development in the North Sea region and contribute to global technological solutions required for decarbonisation of steel production. The EU has an objective to achieve an annual CO₂ storage capacity of 50 million tonnes by 2030, proposed under the Net-Zero Industry Act. Moreover, the International Energy Agency (IEA) estimates CCUS technology needs to apply to more than 37 per cent of primary steel production by 2050, equivalent to 399 Mtpa of CO₂, for the Net Zero Emissions scenario (Source: IEA Net Zero Roadmap - 2023 update).

To further understand how MHI's carbon capture technology can be incorporated into existing steel plants, ArcelorMittal is facilitating the trial in Gent, Belgium, with MHI supplying its proprietary carbon capture technology and supporting the engineering studies. BHP and Mitsubishi Development, as key suppliers of high-quality steelmaking raw materials to ArcelorMittal's European operations, are supporting trial funding.

Speaking in Gent at the consortium meeting, ArcelorMittal Belgium's CEO, Manfred Van Vlierberghe, said: "ArcelorMittal Belgium's decarbonisation efforts can be summarized in three axes. The first axis focuses on energy efficiency: reuse of waste heat and renewable energy. In our second axis, we are replacing coal with a combination of gas and electrification. And finally, the third axis, is based on circular use of carbon - CCU and CCS. Here, the installation of the carbon capture unit on our Gent blast furnace is a great example. The main ambition is to achieve completely carbon-free processes. A radical change is difficult, so we embrace every step that takes us towards our goal."

MHI's Senior Vice President (CCUS) of GX (Green Transformation) Solutions, Tatsuto Nagayasu, said: "The launch of this pilot carbon capture unit marks a significant milestone on the iron and steel industry's journey toward net-zero emissions. As a provider of innovative technologies, we are thrilled to witness our solutions in action, helping to decarbonize existing assets. We eagerly anticipate further deploying our technologies to achieve this goal."

BHP Group Sales & Marketing Officer Michiel Hovers said "This represents real progress in proving up the feasibility of carbon capture for steel production, and BHP is delighted to be part of this consortium working on the pilot plant. This work could help develop a technology that may significantly lower CO₂ emissions intensity from the blast furnace which remains critical to meet steel demand, and while other pathways are further matured."

Mitsubishi Development Chief Executive Officer, Kenichiro Tauchi said "This pilot is a significant step

towards advancement of carbon capture technology as a potential solution to achieve solid emission reductions in the steel sector. We will continue to demonstrate our commitment to advancing confidence in reducing emissions in hard to abate industries as we move towards achieving a carbon neutral society."

The trial at Gent will have two phases. The first phase involves separating and capturing the CO₂ from the top gas from the blast furnace at a rate of around 300kg of CO₂ a day - a technical challenge due to the differing levels of contaminants in the top gas. The second phase involves testing the separating and capturing of CO₂ in the off-gases in the hot strip mill reheating furnace, which burns a mixture of industrial gases including coke gas, blast furnace gases and natural gas.

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