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Advancing towards a competitive and sustainable steel's life cycle: the role of advanced process control in sustainable iron ore processing

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Sintering and pelletizing are critical upstream process that impact the performance of ironmaking and steelmaking operations through the quality of sinter and pellet feed. Conventionally, iron ore quality has been monitored through offline laboratory analyses. However, it limits the potential of process optimization, as it does not allow for timely adjustments in response to real-time process variations. This study presents the digitalization approach to real-time ore quality optimization by the advanced process control (APC) system across ore processing operations. By enabling continuous quality monitoring and automated process adjustment, this digital solution not only optimizes material and process efficiency in ore processing stage but also enhances productivity, energy efficiency and decarbonization potential in downstream ironmaking and steelmaking operations.

Primary author: Dr WEI, Wenjing (ABB)

Presenter: Dr WEI, Wenjing (ABB)

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