Towards Carbon Neutral Primary Aluminium Smelting via Carbon Dioxide Capture (and Storage)

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Abstract

There is a growing awareness that primary aluminium smelters must reduce the Scope 1 direct related GHG emissions of the smelting processes. In this presentation the options of CO_2 capture technology for these Scope 1 reductions of the lowering of the GHG footprint will be discussed. As the use of carbon anodes as leading technology is still in the forecast for many years to come, technology is needed to reduce the direct CO_2 emissions from the electrolysis process. Presented will be the potential of the application of CO_2 capture from pot ventilation gases. This is challenging and shown will be what hurdles need to be overcome and how to integrate this technology in a smelter operation to arrive at a good, viable technical solution and economically feasible capture of CO_2. A review of worldwide activities in this industry is provided and revealing that this is all new. Therefore, comments are provided about how the application of CO_2 capture technology can be moved closer to commercial implementation. A technology roadmap is suggested together with comments on how not only suppliers, but the industry as a whole must work together to advance the development of CO_2 capture processes.

Keywords: Carbon capture and storage (CCS), Carbon neutral aluminium, Greenhouse gas emissions (GHG), GHG footprint, CO_2 capture.