

Moving to CO₂-Neutral Alumina and Aluminium Production at Norsk Hydro

Hans Erik Vatne

Senior Vice President, Chief Technology Officer,
Norsk Hydro ASA, Oslo, Norway
Corresponding author: hans.erik.vatne@hydro.com

Abstract

In this presentation, Norsk Hydro's approach to sustainability throughout the whole value chain is outlined. Main focus is on carbon footprints but also waste and other emissions will be touched upon. For bauxite and alumina key actions are fuel switch from coal and heavy oil via natural gas as a probable intermediate stage and electrification and use of hydrogen as the likely longer-term solutions. In the smelter area we are looking into carbon capture and storage technologies for existing Hall-Heroult smelters. Here, the challenges are low concentrations of CO₂ and pollution in the off-gases, which makes standard amine technology costly. We have evaluated and tested out a range of technologies, also based on direct air capture technology. We are also exploring a chloride route and following work on bio carbon and inert anodes. In the casthouses we are working on replacing natural gas with hydrogen and also strongly focusing increased and more efficient use of recycling of post-consumer scrap which contributes to reduced overall carbon footprint but also more challenging exhaust gases. Downstream is very much about increased use of low-carbon aluminium and substituting less sustainable materials and high-carbon aluminium. Examples of such products are Hydro's Reduxa and Circal.

Keywords: Sustainability, Carbon footprints, Emissions, Waste.