Decarbonisation: ‘Difficult’ but possible

13 August 2021

(c) 2016 Anton Kurashenko/Shutterstock

Glass production in the UK has a long history, with companies such as Pilkington, in St Helens, having been in operation since 1826. The glass making industry has managed many transitions over the decades, including the implementation of modern tin-bath float glass technology and the conversion of glass melting burners from coal to natural gas.

One of the next transformational challenges will be to reduce carbon dioxide (CO2) emissions to air. This is an important and unavoidable task for glass makers, since CO2 is released from minerals during the glass melting process. But the good news is that technologies exist, and more are on the horizon, to enable cost-effective decarbonisation of glass making.

During glass making, like lime and cement production, CO2 emissions are unavoidable, because the sands and minerals used contain CO2, which is released during the melting process. These mineral processing industries must live with the fact that geogenic CO2 is generated, even if heating

from renewable electrical power or hydrogen is used to replace fossil fuel fired burners. However, there are many things that can be done to mitigate CO2 emissions to the atmosphere. Decarbonisation may be 'difficult' but will be possible.

Part of the decarbonisation solution in mineral processing must include 'carbon capture'. A range of technologies for capturing CO2 emissions exist, such as absorption into an amine-type solvent or absorption onto solid sorbents that have a high affinity for CO2. Mineralisation of the CO2, for example through combination with ultramafic rocks, is another way to capture CO2 emissions.

In some cases, the captured CO2 can be utilised. In other cases, it may be injected underground, for permanent storage in a carbon capture and storage (CCS) scheme. In the UK, several CCS schemes are being considered for government support and implementation, such as HyNet North West, the Acorn Project and Zero Carbon Humber.

The UK glass making industry undoubtedly shares the aspiration to decarbonise, with many other sectors, and lessons can be shared across the various mineral processing sectors. In the European cement industry, there are many pilot projects for decarbonisation of post-combustion and geogenic CO2 emissions underway.

Without doubt, capital will need to be invested and additional energy will be required, with the result that glass products may be marginally more expensive. But these are the costs that must be borne universally, as we move closer to becoming a net-zero society.

Stephen B Harrison
Managing director of sbh4 consulting

Allegra Cresswell-Turner
Associate consultant at sbh4 consulting