

Case Study 'Aluminium' – circular economy in the cement industry

Four primary elements, calcium, silicon, aluminium and iron are required to make cement. Local limestone and shale quarries provide the calcium and silicon and smaller quantities of aluminium and iron. Supplementation to get the correct proportion of aluminium and iron is typically required and these are obtained by the importation of bauxite (rich in alumina) and iron ore to supply iron to the cement factory.

One of the CMI member cement factories, Irish Cement Platin, has significantly reduced the requirement for external supplies of bauxite. Since 2011, when Platin first started replacing fossil fuels with Solid Recovered Fuel (SRF) it has been able to reduce the importation and delivery of bauxite by approximately 90,000 tonnes.

SRF is made from non-recyclable waste materials like paper, plastic and composite packaging. Close to 2% of the SRF used in Platin contains non-recyclable aluminium, primarily from foil-lined composite packaging, (examples include crisp packets and packaging for coffee). The SRF is primarily needed for its energy content however, the non-combustible or mineral fraction of the SRF, in this case the alumina, becomes available at high temperatures inside the cement kiln. Here it mixes with the other essential ingredients to form the cement clinker.

At an elemental level the aluminium in the SRF is recycled and allows Platin to reduce the quarrying and transport impacts of importing bauxite. It is a real-life example of the circular economy in action, where discarded resources are recycled in a manufacturing process instead of using virgin resources. This is an added benefit to the primary goal of replacing fossil fuels.

This type of 'hidden recycling' is being increasingly recognised around Europe with a number of Member States working to assess its contribution to the local circular economy and national recycling targets.