Opportunities And Challenges For Coal Combustion Products With A Circular Economy

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Reported in 2019 coal and its use in energy production is under considerable scrutiny using current combustion technology and resulting CO2 emissions with the main driver being climate change. Coal use and accordingly coal combustion products has continued to grow in South-East Asia and India and to stabilize or slightly reduce in China, with reductions in Japan, Korea, America, Europe and Australia.

Coal combustion products (CCPs) are well established as valuable, high-volume inputs for the manufacture of construction and building materials. Functional benefits result in applications such as substitutes for energy and resource intensive materials including cement, sand and aggregates – these not only provide options for lower embedded carbon but contribute towards the principles of circularity of products and constructions where they are used. The circular economy is a modern term used to describe an alternative to a traditional linear economy (manufacture, use, dispose). In a circular economy we keep resources in use for as long as possible, thus extracting the maximum value from them whilst in use, then recover and regenerate products and materials until the end of each service life. This adds to the raw material efficiency of products where CCPs are considered valuable raw materials.

Challenges discussed in this paper include addressing future resources demands through increased production of certified sources, harvesting of surplus CCPs, navigating diverse regulatory constraints and managing risks – importantly – increasing general consensus within regional and international product standards and improving supply-side (Generators of CCPs) knowledge of quality consistency by consumers.