

The Removal of Carbon from Fly Ash using Supercritical Water Oxidation

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KEYWORDS

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ABSTRACT

Removal of carbon from fly ash remains a serious issue in the UK, and elsewhere, with the possibility of landfill taxes proportional to carbon content. The UK currently charges £2 per tonne for fly ash disposal as landfill although Germany charges £40. Carbon content also effects ash utilization, with stringent regulations governing potential markets. With this as a backdrop, there is a need to be able to remove carbon from fly ash streams, ideally in entirety or, at the very least, to lower carbon levels for utilisation.

One method for removal is the treatment of fly ash in supercritical or near supercritical water. As water approaches the supercritical point (374 °C, 218 atm.) its properties change from a polar liquid to a fluid with a low dielectric constant and low pH. Carbonaceous compounds can be easily oxidised in this environment.

Since power stations already produce superheated water, it would be possible for a generator to modify operations in order to treat the back end fly ash to remove carbon. This would avoid landfill duties and open up markets for the ash, due to its improved composition.