

# Utilisation of Biomass Co-combustion Residues from Pulverised Coal Boilers

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## ABSTRACT

The effect of biomass co-combustion with coal on ash quality and utilization aspects was investigated. Co-combustion tests were performed in lab, semi-industrial and industrial scale plants, using several coal-biomass blends. Two different sets of co-combustion residues were analyzed according to their production process and analysis method. Samples collected from lab and semi-industrial scale tests were analysed for major elements and heavy metals content, loss on ignition (LOI), free CaO content and their grain size distribution. Natural radioactivity and radon exhalation rate were also measured in samples collected from tests performed at large-scale power plants. The activity of <sup>226</sup>Ra and <sup>232</sup>Th in the ash was relatively low, in most cases less than 100Bqkg<sup>-1</sup>, while that of <sup>40</sup>K in some cases exceeded 2kBqkg<sup>-1</sup>. The artificial radionuclide <sup>137</sup>Cs was detected in some cases as well. Since a variety of co-combustion residues were tested, important implications concerning the ash composition and, consequently, its further use in potential applications came up. Results showed that properties of co-combustion residues are directly connected to the combustion conditions and individual blend components. Biomass utilisation as secondary fuel in co-combustion processes is technically and economically feasible up to 20% <sup>w/w</sup> and the produced ash could be further utilised without any major treatment.

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