

# Processing, Transporting, and Utilizing Coal Combustion By-Products

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## **ABSTRACT**

The United States is a major producer of agricultural, industrial, mining, and municipal by-products. Traditional methods of by-product disposal most often have resorted to landfill and stockpiling on land. The accumulation of these by-products presents considerable environmental, aesthetic, economical and social problems. With various public and private agencies actively promoting alternative methods of solid by-product disposal, recycling and conversion into viable construction materials seems to be a logical solution that allows for the conservation of natural resources, abates further pollution, and preserves the environment.

This paper addresses three sequential components involved with coal combustion by-products, namely, processing, transportation and utilization. In the first phase, processing of ash from coal combustion and its ability to yield products with commercial applications are introduced. Four processed products, including cenospheres, magnetic material, high-carbon content material, and base material for cement/concrete applications, are discussed. The paper then discusses transportation and hauling of coal combustion by-products using three major groups of transportation systems trucks, rail cars, and containers. The selection of one technology over the other based on system cost, and as affected by transportation distance and material volume, is examined thoroughly. Finally, the paper addresses the most recent laboratory and field studies dealing with utilization of fluidized bed and pulverized coal combustion by-products for highway applications. The results of a number of laboratory investigations and two field demonstration projects are used to ascertain the suitability of coal combustion residues as paving materials in road applications.